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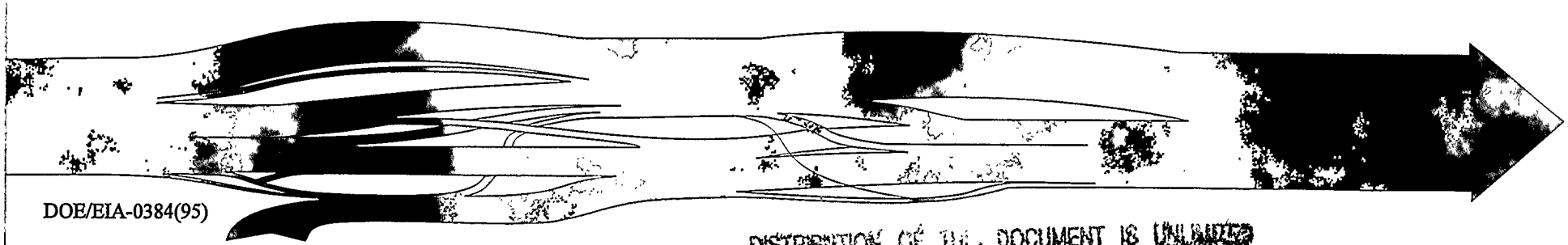

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# Annual Energy Review 1995

## July 1996

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Office of Energy Markets and End Use
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Washington, DC 20585

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# Preface

This fourteenth edition of the *Annual Energy Review (AER)* presents the Energy Information Administration's historical energy statistics. For most series, statistics are given for every year from 1949 through 1995. Because coverage spans four and a half decades, the statistics in this report are well-suited to long-term trend analyses.

The *AER* is comprehensive. It covers all major energy activities, including consumption, production, trade, stocks, and prices, for all major energy commodities, including fossil fuels and electricity. The *AER* also presents Energy Information Administration (EIA) statistics on renewable energy sources. In the past, EIA's consumption series have included about half of the renewable energy used in the United States, the amount consumed by electric utilities. Last year, for the first time, usage by other consumers was integrated into EIA's historical consumption series for 1990 forward. Incorporation of non-electric utility data into U.S. energy consumption adds about 3 quadrillion Btu to the total.

This year's report introduces four new tables:

- Table 3.13, "State Government Severance Taxes, 1985–1993," supplies data on effective **energy severance taxes** per volume of crude oil, natural gas, and coal and on energy severance taxes as a share of all taxes.
- Table 3.14, "Companies Reporting to the Financial Reporting System, 1975–1994," is a grid displaying which major U.S. energy companies reported to the **Financial Reporting System** (FRS) in each year from 1975 through 1994 (the most recent year for which FRS data are available).
- Table 4.9, "FRS Companies' Expenditures for Oil and Gas Exploration and Development by Region, 1977–1994," presents, for the first time in this report, data on **FRS companies' expenditures for exploration in Canada, Europe, and other regions.**
- Table 10.9, "Electric Power Industry Net Generation by Selected Renewable Energy Resources, 1949–1995," presents data on **renewable energy use by electric utilities and nonutility power producers** side by side in the same table to allow the reader to compare them directly.

For the most part, fuel-specific data in the *AER* are expressed in physical units, such as barrels, cubic feet, and short tons. The integrated summary data in Section 1 are expressed in Btu. The Btu values are calculated by using the conversion factors in Appendix A. Statistics expressed in Btu are valuable in that they allow for comparisons among different fuels and for the calculation of integrated summary statistics, such as U.S. consumption of energy.

The *AER* emphasizes *domestic* energy statistics. Accordingly, Sections 1 through 10 and 12 of this report are devoted to U.S. statistics, while Section 11 is reserved for most of the international statistics, such as world production of energy. The one exception is trade data. For example, Table 5.4, which presents statistics on petroleum imports by country of origin, is found in Section 5. To keep table and figure titles in Sections 1 through 10 and 12 concise, "United States" is usually not specified. Readers interested in more detailed international data than are presented in the *AER* should consult EIA's *International Energy Annual.*

Publication of the AER each year is in keeping with responsibilities given EIA in Section 205(a)(2) of the Department of Energy Organization Act, Public Law 95-91. The report is intended for use by Members of Congress, Federal and State agencies, energy analysts, and the general public. EIA welcomes suggestions from readers regarding its energy data series. To make a suggestion or to obtain specific information regarding the contents of the *AER*, readers may call any of the subject specialists listed as contacts on the preceding pages.

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# Contents


| | Page |
|---|---|
| Major Energy Developments in 1995 | xix |
| 1. Energy Overview | 1 |
| 2. End–Use Energy Consumption | 35 |
| 3. Financial Indicators | 81 |
| 4. Energy Resources | 109 |
| 5. Petroleum | 137 |
| 6. Natural Gas | 185 |
| 7. Coal | 207 |
| 8. Electricity | 227 |
| 9. Nuclear Energy | 257 |
| 10. Renewable Energy | 265 |
| 11. International Energy | 285 |
| 12. Environmental Indicators | 329 |
| Appendices | |
| A. Thermal Conversion Factors | 343 |
| B. Metric and Other Physical Conversion Factors | 357 |
| C. Carbon Dioxide Emission Factors for Coal | 361 |
| D. Energy Units in Perspective | 363 |
| E. Gross Domestic Product and Implicit Price Deflators | 365 |
| F. U.S. Census Regions and Divisions | 367 |
| Glossary | 369 |
| Diagrams | |
| 1. Energy Flow, 1995 | 3 |
| 2. Petroleum Flow, 1995 | 139 |
| 3. Natural Gas Flow, 1995 | 187 |
| 4. Coal Flow, 1995 | 209 |
| 5. Electricity Flow, 1994 | 229 |

# Tables


**1. Energy Overview**

Page

1.1 Energy Overview, Selected Years, 1960-1995 . . . . . 5
1.2 Energy Production by Source, 1949-1995 . . . . . 7
1.3 Energy Consumption by Source, 1949-1995 . . . . . 9
1.4 Energy Imports, Exports, and Net Imports, 1949-1995 . . . . . 11
1.5 Energy Consumption and Energy Consumption per Capita, 1949-1995 . . . . . 13
1.6 Energy Consumption and Consumption per Capita by State, 1993 . . . . . 15
1.7 Energy Consumption per Dollar of Gross Domestic Product, 1949-1995 . . . . . 17
1.8 Heating Degree-Days by Month, 1949-1996 . . . . . 19
1.9 Cooling Degree-Days by Month, 1949-1996 . . . . . 21
1.10 Heating Degree-Days by Census Division, 1949-1995 . . . . . 23
1.11 Cooling Degree-Days by Census Division, 1949-1995 . . . . . 25
1.12 U.S. Government Energy Consumption, Fiscal Years 1981-1995 . . . . . 27
1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 1985 and 1995 . . . . . 29
1.14 Fossil Fuel Production on Federally Administered Lands, 1949-1994 . . . . . 31
1.15 Fossil Fuel Consumption for Nonfuel Use, 1980-1995 . . . . . 33

**2. End-Use Energy Consumption**

2.1 Energy Consumption by End-Use Sector, 1949-1995 . . . . . 39
2.2 Manufacturing Energy Consumption Measures, 1991 . . . . . 41
2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991 . . . . . 43
2.4 Manufacturing Energy Intensity by Industry, 1985, 1988, and 1991 . . . . . 45
2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991 . . . . . 47
2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Energy Source, 1991 . . . . . 49
2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present From 1989-1991 . . . . . 51
2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991 . . . . . 53
2.9 Household Energy Consumption by Census Region, Selected Years, 1978-1993 . . . . . 55
2.10 Household Energy Consumption and Expenditures by End Use and Energy Source, Selected Years, 1978-1993 . . . . . 57
2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993 . . . 59
2.12 Households With Selected Appliances, Selected Years, 1978-1993 . . . . . 61
2.13 Type of Heating in Occupied Housing Units, Selected Years, 1950-1993 . . . . . 63
2.14 Household Motor Vehicle Data, 1983, 1985, 1988, 1991, and 1994 . . . . . 65
2.15 Motor Vehicle Efficiency, 1960-1994 . . . . . 67
2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1995 . . . . . 69
2.17 Commercial Buildings Characteristics by Energy Source, Selected Years, 1979-1992 . . . . . 71
2.18 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-1992 . . . . . 73

## Tables (continued)


**2. End-Use Energy Consumption (continued)** Page

2.19 Commercial Buildings Expenditures by Energy Source, Selected Years, 1979-1992 . . . . . 75
2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992 . . . . . 77
2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1992 . . . . . 79

**3. Financial Indicators**

3.1 Fossil Fuel Production Prices, 1949-1995 . . . . . 83
3.2 Value of Fossil Fuel Production, 1949-1995 . . . . . 85
3.3 Value of Fossil Fuel Imports, 1949-1995 . . . . . 87
3.4 Value of Fossil Fuel Exports, 1949-1995 . . . . . 89
3.5 Value of Fossil Fuel Net Imports, 1949-1995 . . . . . 91
3.6 Energy Expenditures and Price Indices, 1970-1993 . . . . . 93
3.7 Energy Price Estimates by Sector, 1970, 1975, 1980, and 1985-1993 . . . . . 95
3.8 Energy Expenditure Estimates, 1970, 1975, 1980, and 1985-1993 . . . . . 97
3.9 FRS Companies' Operations, Selected Statistics, 1975-1994 . . . . . 99
3.10 FRS Companies' Net Income, 1975-1994 . . . . . 101
3.11 FRS Companies' Net Investment in Place, 1975-1994 . . . . . 103
3.12 FRS Companies' Additions to Investment in Place, 1975-1994 . . . . . 105
3.13 State Government Severance Taxes, 1985-1993 . . . . . 107
3.14 Companies Reporting to the Financial Reporting System, 1975-1994 . . . . . 108

**4. Energy Resources**

4.1 Undiscovered Recoverable Resource Estimates for Petroleum, 1987 and 1994 . . . . . 111
4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, End of Year 1977-1994 . . . . . 113
4.3 Oil and Gas Drilling Activity Measurements, 1949-1995 . . . . . 115
4.4 Oil and Gas Exploratory and Development Wells, 1949-1995 . . . . . 117
4.5 Oil and Gas Exploratory Wells, 1949-1995 . . . . . 119
4.6 Oil and Gas Development Wells, 1949-1995 . . . . . 121
4.7 Costs of Oil and Gas Wells Drilled, 1960-1994 . . . . . 123
4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry, 1975-1994 . . . . . 125
4.9 FRS Companies' Expenditures for Oil and Gas Exploration and Development by Region, 1977-1994 . . . . . 127
4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year 1949-1995 . . . . . 129
4.11 Coal Demonstrated Reserve Base, January 1, 1995 . . . . . 131
4.12 Uranium Exploration and Development Drilling, 1949-1995 . . . . . 133
4.13 Uranium Reserves and Resources, December 31, 1995 . . . . . 135

## Tables (continued)


**5. Petroleum**

Page

5.1 Petroleum Overview, 1949-1995 . . . . . 141
5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1995 . . . . . 143
5.3 Petroleum Imports by Type, 1949-1995 . . . . . 145
5.4 Petroleum Imports by Country of Origin, 1960-1995 . . . . . 147
5.5 Petroleum Exports by Type, 1949-1995 . . . . . 149
5.6 Petroleum Exports by Country of Destination, 1960-1995 . . . . . 151
5.7 Petroleum Net Imports by Country of Origin, 1960-1995 . . . . . 153
5.8 Refinery Input and Output, 1949-1995 . . . . . 155
5.9 Refinery Capacity and Utilization, 1949-1995 . . . . . 157
5.10 Natural Gas Plant Liquids Production, 1949-1995 . . . . . 159
5.11 Petroleum Products Supplied by Type, 1949-1995 . . . . . 161
5.12a Petroleum Products Supplied to the Residential and Commercial Sector and the Industrial Sector, 1949-1995 . . . . . 164
5.12b Petroleum Products Supplied to the Transportation Sector, Electric Utilities, and Total, 1949-1995 . . . . . 165
5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1994 . . . . . 167
5.14 Petroleum Primary Stocks by Type, End of Year 1949-1995 . . . . . 169
5.15 Strategic Petroleum Reserve, 1977-1995 . . . . . 171
5.16 Crude Oil Domestic First Purchase Prices, 1949-1995 . . . . . 173
5.17 Landed Costs of Crude Oil Imports From Selected Countries, 1973-1995 . . . . . 175
5.18 Value of Crude Oil Imports From Selected Countries, 1973-1995 . . . . . 177
5.19 Crude Oil Refiner Acquisition Costs, 1968-1995 . . . . . 179
5.20 Refiner Sales Prices and Refiner Margins of Selected Petroleum Products, 1980-1995 . . . . . 181
5.21 Motor Gasoline and Residential Heating Oil Retail Prices, 1949-1995 . . . . . 183

**6. Natural Gas**

6.1 Natural Gas Overview, 1949-1995 . . . . . 189
6.2 Natural Gas Production, 1949-1995 . . . . . 191
6.3 Natural Gas Imports, Exports, and Net Imports, 1949-1995 . . . . . 193
6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1995 . . . . . 195
6.5 Natural Gas Delivered for the Account of Others, 1986-1994 . . . . . 197
6.6 Natural Gas Consumption by Sector, 1949-1995 . . . . . 199
6.7 Natural Gas in Underground Storage, End of Year 1954-1995 . . . . . 201
6.8 Natural Gas Wellhead and Import Prices, 1949-1995 . . . . . 203
6.9 Natural Gas Prices by Sector, 1967-1995 . . . . . 205

**7. Coal**

7.1 Coal Overview, 1949-1995 . . . . . 211
7.2 Coal Production, 1949-1995 . . . . . 213

## Tables (continued)


**7. Coal (continued)** Page

7.3 Coal Consumption by Sector, 1949-1995 . . . 215
7.4 Coal Exports by Country of Destination, 1960-1995 . . . 217
7.5 Coal Stocks, End of Year 1949-1995 . . . 219
7.6 Coal Mining Productivity, 1949-1994 . . . 221
7.7 Coke Overview, 1949-1995 . . . 223
7.8 Coal Prices, 1949-1995 . . . 225

**8. Electricity**

8.1 Electricity Overview, 1949-1995 . . . 231
8.2 Electric Power Industry Net Generation and Net Summer Capability, 1992-1994 . . . 233
8.3 Electric Utility Net Generation of Electricity by Energy Source, 1949-1995 . . . 235
8.4 Electric Utility Net Generation of Electricity by Prime Mover, 1949-1995 . . . 237
8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity, 1949-1995 . . . 239
8.6 Electric Utility Retail Sales of Electricity by End-Use Sector, 1949-1995 . . . 241
8.7 Electric Utility Demand-Side Management Programs: Peakload Reductions, Energy Savings, and Costs, 1989-1994 . . . 243
8.8 Electric Utility Net Summer Capability, End of Year 1949-1995 . . . 245
8.9 Electric Utility Noncoincidental Peak Load by Region, 1986-1994 . . . 247
8.10 Electric Utility Stocks of Coal and Petroleum, End of Year 1949-1995 . . . 249
8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1995 . . . 251
8.12 Nonutility Power Overview, 1989-1994 . . . 253
8.13 Nonutility Power Gross Generation, 1994 . . . 255

**9. Nuclear Energy**

9.1 Nuclear Generating Units, End of Year 1973-1995 . . . 259
9.2 Nuclear Power Plant Operations, 1957-1995 . . . 261
9.3 Uranium Overview, 1949-1995 . . . 263

**10. Renewable Energy**

10.1a Renewable Energy Consumption by Source, 1990-1995 . . . 267
10.1b Renewable Energy Consumption by Sector, 1990-1995 . . . 267
10.2 Wood and Waste Energy and Alcohol Fuels Consumption by Sector and Census Region, Selected Years 1981-1995 . . . 269
10.3 Households That Burn Wood, Selected Years, 1980-1993 . . . 271
10.4 Solar Thermal Collector Shipments by Type and Trade, 1974-1984 and 1986-1994 . . . 273
10.5 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1994 . . . 275
10.6 Photovoltaic Cell and Module Shipments and Trade, 1982-1994 . . . 277

## Tables (continued)


**10. Renewable Energy (continued)** Page

10.7 Photovoltaic Cell and Module Shipments by End Use, 1989-1994 . . . . . 279
10.8 Electric Power Industry Net Summer Capability and Net Generation of Electricity by Selected Renewable Energy Resources, 1949-1995 . . . . . 281
10.9 Electric Power Industry Net Generation by Selected Renewable Energy Resources, 1949-1995 . . . . . 283

**11. International Energy**

11.1 World Primary Energy Production, 1985-1994 . . . . . 289
11.2 World Primary Energy Production by Source, 1973-1994 . . . . . 291
11.3 World Crude Oil and Natural Gas Reserves, January 1, 1995 . . . . . 293
11.4 World Rotary Rigs in Operation, 1982-1994 . . . . . 295
11.5 World Crude Oil Production, 1960-1995 . . . . . 297
11.6 World Natural Gas Plant Liquids Production, 1973-1994 . . . . . 299
11.7 World Crude Oil Prices by Selected Type, 1970-1996 . . . . . 301
11.8 World Crude Oil Refining Capacity, 1970-1994 . . . . . 303
11.9 World Petroleum Consumption, 1960-1994 . . . . . 305
11.10 Petroleum Stocks in OECD Countries, End of Year 1973-1994 . . . . . 307
11.11 World Dry Natural Gas Production, 1985-1994 . . . . . 309
11.12 World Dry Natural Gas Supply and Disposition, 1993 . . . . . 311
11.13 World Dry Natural Gas Consumption, 1980-1994 . . . . . 313
11.14 World Recoverable Reserves of Coal . . . . . 315
11.15 World Coal Production, 1985-1994 . . . . . 317
11.16 World Coal Consumption, 1980-1994 . . . . . 319
11.17 World Net Generation of Electricity by Type, 1993 . . . . . 321
11.18 World Electrical Installed Capacity by Type, January 1, 1994 . . . . . 323
11.19 World Hydroelectric Power Net Generation, 1985-1994 . . . . . 325
11.20 World Nuclear Electricity Gross Generation, 1982-1995 . . . . . 327

**12. Environmental Indicators**

12.1 Estimated Emissions of Greenhouse Gases by Gas, 1985-1994 . . . . . 331
12.2 Carbon Dioxide Emissions From Fossil Energy Consumption by Sector, 1980-1994 . . . . . 333
12.3 Carbon Dioxide Emissions From Energy Use by Sector, 1994 . . . . . 335
12.4 Methane Emissions From Anthropogenic Sources, 1985-1994 . . . . . 337
12.5 Emissions From Fossil-Fueled Steam-Electric Generating Units at Electric Utilities, 1985-1994 . . . . . 339
12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment, 1985-1994 . . . . . 341

## Tables (continued)


**Appendix A. Thermal Conversion Factors** Page

A1 Approximate Heat Content of Petroleum Products . . . 343
A2 Approximate Heat Content of Crude Oil, Crude Oil and Products, and Natural Gas Plant Liquids, 1949-1995 . . . 344
A3 Approximate Heat Content of Petroleum Product Weighted Averages, 1949-1995 . . . 345
A4 Approximate Heat Content of Natural Gas, 1949-1995 . . . 346
A5 Approximate Heat Content of Coal and Coal Coke, 1949-1995 . . . 347
A6 Approximate Heat Content of Coal by Type, 1949-1995 . . . 348
A7 Approximate Heat Rates for Electricity, 1949-1995 . . . 349

**Appendix B. Metric and Other Physical Conversion Factors**

B1 Metric Conversion Factors . . . 358
B2 Metric Prefixes . . . 359
B3 Other Physical Conversion Factors . . . 359

**Appendix C. Carbon Dioxide Emission Factors for Coal**

C1 Average Carbon Dioxide Emission Factors for Coal by Coal-Consuming Sector, 1980-1994 . . . 361

**Appendix D. Energy Units in Perspective**

D1 U.S. Daily Per Capita Consumption of Energy by Type, 1975, 1985, and 1995 . . . 363
D2 Energy Equivalents . . . 364

**Appendix E. Gross Domestic Product and Implicit Price Deflators**

E1 Gross Domestic Product and Implicit Price Deflators, 1949-1995 . . . 365

# Figures


**1. Energy Overview**

Page

1.1 Energy Overview . . . . . 4
1.2 Energy Production by Source . . . . . 6
1.3 Energy Consumption by Source . . . . . 8
1.4 Energy Imports, Exports, and Net Imports, 1949-1995 . . . . . 10
1.5 Energy Consumption and Energy Consumption per Capita, 1949-1995 . . . . . 12
1.6 Energy Consumption and Consumption per Capita by State, 1993 . . . . . 14
1.7 Energy Consumption per Dollar of Gross Domestic Product . . . . . 16
1.8 Heating Degree-Days for Heating Season, by Month, 1949-1996 . . . . . 18
1.9 Cooling Degree-Days for Cooling Season, by Month, 1949-1995 . . . . . 20
1.10 Heating Degree-Days by Census Division, 1949-1995 . . . . . 22
1.11 Cooling Degree-Days by Census Division, 1949-1995 . . . . . 24
1.12 U.S. Government Energy Consumption, Fiscal Years . . . . . 26
1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years . . . . . 28
1.14 Fossil Fuel Production on Federally Administered Lands . . . . . 30
1.15 Fossil Fuel Consumption for Nonfuel Use . . . . . 32

**2. End-Use Energy Consumption**

2.1 Energy Consumption by End-Use Sector, 1949-1995 . . . . . 38
2.2 Manufacturing Energy Consumption Measures, 1991 . . . . . 40
2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991 . . . . . 42
2.4 Manufacturing Offsite Energy Intensity Change by Industry Group, 1985 to 1991 . . . . . 44
2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991 . . . . . 46
2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation, 1991 . . . . . 48
2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present From 1989-1991 . . . . . 50
2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991 . . . . . 52
2.9 Household Energy Consumption . . . . . 54
2.10 Household Energy Consumption and Expenditures . . . . . 56
2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993 . . . . . 58
2.12 Households With Selected Appliances, 1980 and 1993 . . . . . 60
2.13 Type of Heating in Occupied Housing Units, 1950 and 1993 . . . . . 62
2.14 Household Motor Vehicle Data . . . . . 64
2.15 Motor Vehicle Efficiency, 1960-1994 . . . . . 66
2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1995 . . . . . 68
2.17 Commercial Buildings Characteristics by Energy Source . . . . . 70
2.18 Commercial Buildings Consumption by Energy Source . . . . . 72

## Figures (continued)


**2. End-Use Energy Consumption (continued)** Page

2.19 Commercial Buildings Expenditures by Energy Source . . . . . 74
2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992 . . . . . 76
2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1992 . . . . . 78

**3. Financial Indicators**

3.1 Fossil Fuel Production Prices . . . . . 82
3.2 Value of Fossil Fuel Production . . . . . 84
3.3 Value of Fossil Fuel Imports . . . . . 86
3.4 Value of Fossil Fuel Exports . . . . . 88
3.5 Value of Fossil Fuel Net Imports, 1949-1995 . . . . . 90
3.6 Energy Expenditures and Price Indices, 1970-1993 . . . . . 92
3.7 Energy Price Estimates by Sector, 1985-1993 . . . . . 94
3.8 Energy Expenditure Estimates, 1985-1993 . . . . . 96
3.9 FRS Companies' Operations, Selected Statistics, 1975-1994 . . . . . 98
3.10 FRS Companies' Return on Investment by Type of Business, 1977-1994 . . . . . 100
3.11 FRS Companies' Net Investment in Place, 1975-1994 . . . . . 102
3.12 FRS Companies' Additions to Investment in Place, 1975-1994 . . . . . 104
3.13 State Government Severance Taxes, 1985-1993 . . . . . 106

**4. Energy Resources**

4.1 Undiscovered Recoverable Resource Estimates for Petroleum . . . . . 110
4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, End of Year 1977-1994 . . . . . 112
4.3 Oil and Gas Drilling Activity Measurements . . . . . 114
4.4 Oil and Gas Exploratory and Development Wells, 1949-1995 . . . . . 116
4.5 Oil and Gas Exploratory Wells, 1949-1995 . . . . . 118
4.6 Oil and Gas Development Wells, 1949-1995 . . . . . 120
4.7 Costs of Wells Drilled, 1960-1994 . . . . . 122
4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry . . . . . 124
4.9 FRS Companies' Expenditures for Oil and Gas Exploration and Development by Region . . . . . 126
4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year . . . . . 128
4.11 Coal Demonstrated Reserve Base, January 1, 1995 . . . . . 130
4.12 Uranium Exploration and Development Drilling, 1949-1995 . . . . . 132
4.13 Uranium Reserves and Resources, December 31, 1995 . . . . . 134

## Figures (continued)


**5. Petroleum** Page

5.1 Petroleum Overview . . . . . 140
5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1995 . . . . . 142
5.3 Petroleum Imports by Type . . . . . 144
5.4 Petroleum Imports by Country of Origin . . . . . 146
5.5 Petroleum Exports by Type . . . . . 148
5.6 Petroleum Exports by Country of Destination . . . . . 150
5.7 Petroleum Net Imports by Country of Origin, 1960-1995 . . . . . 152
5.8 Refinery Input and Output, 1949-1995 . . . . . 154
5.9 Refinery Capacity and Utilization, 1949-1995 . . . . . 156
5.10 Natural Gas Plant Liquids Production . . . . . 158
5.11 Petroleum Products Supplied by Type . . . . . 160
5.12a Petroleum Products Supplied by Sector . . . . . 162
5.12b Petroleum Products Supplied by Product by Sector, 1949-1995 . . . . . 163
5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1994 . . . . . 166
5.14 Petroleum Primary Stocks by Type, End of Year . . . . . 168
5.15 Strategic Petroleum Reserve, 1977-1995 . . . . . 170
5.16 Crude Oil Domestic First Purchase Prices . . . . . 172
5.17 Landed Costs of Crude Oil Imports From Selected Countries . . . . . 174
5.18 Value of Crude Oil Imports From Selected Countries . . . . . 176
5.19 Crude Oil Refiner Acquisition Costs, 1968-1995 . . . . . 178
5.20 Refiner Sales Prices of Selected Petroleum Products, 1980-1995 . . . . . 180
5.21 Motor Gasoline and Residential Heating Oil Retail Prices . . . . . 182

**6. Natural Gas**

6.1 Natural Gas Overview . . . . . 188
6.2 Natural Gas Production, 1949-1995 . . . . . 190
6.3 Natural Gas Imports, Exports, and Net Imports . . . . . 192
6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1995 . . . . . 194
6.5 Natural Gas Delivered for the Account of Others . . . . . 196
6.6 Natural Gas Consumption by Sector . . . . . 198
6.7 Natural Gas in Underground Storage, End of Year 1954-1995 . . . . . 200
6.8 Natural Gas Wellhead and Import Prices . . . . . 202
6.9 Natural Gas Prices by Sector . . . . . 204

**7. Coal**

7.1 Coal Overview . . . . . 210
7.2 Coal Production, 1949-1995 . . . . . 212

## Figures (continued)


**7. Coal (continued)** Page

7.3 Coal Consumption by Sector . . . . . 214
7.4 Coal Exports by Country of Destination . . . . . 216
7.5 Coal Stocks, End of Year . . . . . 218
7.6 Coal Mining Productivity, 1949-1994 . . . . . 220
7.7 Coke Overview, 1949-1995 . . . . . 222
7.8 Coal Prices, 1959-1995 . . . . . 224

**8. Electricity**

8.1 Electricity Overview . . . . . 230
8.2 Electric Power Industry Net Generation and Net Summer Capability, 1994 . . . . . 232
8.3 Electric Utility Net Generation of Electricity by Energy Source . . . . . 234
8.4 Electric Utility Net Generation of Electricity by Prime Mover . . . . . 236
8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity . . . . . 238
8.6 Electric Utility Retail Sales of Electricity . . . . . 240
8.7 Electric Utility Demand-Side Management Programs . . . . . 242
8.8 Electric Utility Net Summer Capability, End of Year . . . . . 244
8.9 Electric Utility Noncoincidental Peak Load . . . . . 246
8.10 Electric Utility Stocks of Coal and Petroleum, End of Year . . . . . 248
8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1995 . . . . . 250
8.12 Nonutility Power Overview, 1989-1994 . . . . . 252
8.13 Nonutility Power Gross Generation, 1994 . . . . . 254

**9. Nuclear Energy**

9.1 Nuclear Generating Units, December 31, 1995 . . . . . 258
9.2 Nuclear Power Plant Operations . . . . . 260
9.3 Uranium Overview . . . . . 262

**10. Renewable Energy**

10.1 Renewable Energy Consumption Estimates . . . . . 266
10.2 Wood and Waste Energy and Alcohol Fuels Consumption . . . . . 268
10.3 Households That Burn Wood, Selected Years, 1980-1993 . . . . . 270
10.4 Solar Thermal Collector Shipments and Trade, 1974-1984 and 1986-1994 . . . . . 272
10.5 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1994 . . . . . 274
10.6 Photovoltaic Cell and Module Shipments and Trade . . . . . 276
10.7 Photovoltaic Cell and Module Shipments by End Use, 1994 . . . . . 278

## Figures (continued)


**10. Renewable Energy (continued)** Page

10.8 Electric Power Industry Net Summer Capability by Selected Renewable Energy Resources . . . . . 280
10.9 Electric Power Industry Net Generation by Selected Renewable Energy Resources . . . . . 282

**11. International Energy**

11.1 World Primary Energy Production . . . . . 288
11.2 World Primary Energy Production by Source . . . . . 290
11.3 World Crude Oil and Natural Gas Reserves, January 1, 1995 . . . . . 292
11.4 World Rotary Rigs in Operation . . . . . 294
11.5 World Crude Oil Production . . . . . 296
11.6 World Natural Gas Plant Liquids Production . . . . . 298
11.7 World Crude Oil Prices by Selected Type . . . . . 300
11.8 World Crude Oil Refining Capacity . . . . . 302
11.9 World Petroleum Consumption . . . . . 304
11.10 Petroleum Stocks in OECD Countries, End of Year . . . . . 306
11.11 World Dry Natural Gas Production . . . . . 308
11.12 World Dry Natural Gas Supply and Disposition, 1993 . . . . . 310
11.13 World Dry Natural Gas Consumption . . . . . 312
11.14 World Recoverable Reserves of Coal . . . . . 314
11.15 World Coal Production . . . . . 316
11.16 World Coal Consumption . . . . . 318
11.17 World Net Generation of Electricity, 1993 . . . . . 320
11.18 World Electrical Installed Capacity by Type, January 1, 1994 . . . . . 322
11.19 World Hydroelectric Power Net Generation . . . . . 324
11.20 World Nuclear Electricity Gross Generation . . . . . 326

**12. Environmental Indicators**

12.1 Estimated Emissions of Greenhouse Gases . . . . . 330
12.2 Carbon Dioxide Emissions From Fossil Energy Consumption by Sector, 1980-1994 . . . . . 332
12.3 Carbon Dioxide Emissions From Energy Use by Sector, 1994 . . . . . 334
12.4 Methane Emissions From Anthropogenic Sources . . . . . 336
12.5 Emissions From Fossil-Fueled Steam-Electric Generating Units at Electric Utilities . . . . . 338
12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment . . . . . 340

**Appendix F. U.S. Census Regions and Divisions**

F1 U.S. Census Regions and Divisions . . . . . 367

# Major Energy Developments in 1995

## Energy Demand Sets Another Record

A reviving domestic economy, generally low energy prices, a heat wave in July and August, and unusually cold weather in November and December all contributed to the fourth consecutive year of growth in U.S. total energy consumption, which rose to an all-time high of almost 91 quadrillion Btu in 1995 (1.3).* The increase came as a result of increases in the consumption of natural gas, coal, nuclear electric power, and renewable energy. Petroleum was the primary exception, and its use declined by only 0.3 percent. (Integrating the amount of renewable energy consumed outside the electric utility sector into U.S. total energy consumption boosted the total by about 3.4 quadrillion Btu, but even without that integration, U.S. total energy consumption would have reached a record level in 1995.)

***Petroleum.*** Electric utilities' preference for other energy sources and somewhat higher prices for crude oil in 1995 led to the small decrease in petroleum consumption (5.12b). Petroleum consumption declined 0.02 million barrels per day from the 1994 level to 17.70 million barrels per day in 1995. A 33-percent decline in electric utilities' consumption of petroleum, as well as a 1.7-percent decline in industrial consumption, more than offset consumption increases of 1.7 percent and 1.8 percent in the transportation sector and the residential and commercial sector, respectively (5.12a and 5.12b).

Of the major petroleum products, residual fuel oil showed the greatest decrease in consumption (5.11). Residual fuel oil consumption fell 17 percent to 0.85 million barrels per day, due to electric utilities' preference for other energy sources, in part to comply with environmental regulations. Consumption of jet fuel also declined, down 1.3 percent to 1.51 million barrels per day. In contrast, consumption of motor gasoline, which consistently accounts for the largest share of all petroleum products supplied, rose 2.5 percent to 7.79 million barrels per day in 1995. The improved economy contributed to an increase in distillate fuel oil consumption of 1.3 percent to 3.20 million barrels per day. Consumption of liquefied petroleum gases rose 1.1 percent to 1.90 million barrels per day.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

***Natural gas.*** Consumption of natural gas in 1995 rose 4.0 percent to 21.6 trillion cubic feet (6.6). Increased demand in all sectors except residential was responsible for the growth. The industrial sector alone consumed 9.8 trillion cubic feet of natural gas in 1995.

***Coal.*** Consumption of coal in 1995 rose 1.1 percent to 941 million short tons (7.3). The increase occurred primarily at electric utilities, where 88 percent of the coal was consumed.

***Electricity.*** Electricity sales of 3.0 trillion kilowatthours were 2.4 percent above 1994 sales (8.6). Sales to the residential sector rose 3.5 percent, and sales to the industrial sector rose 0.3 percent. Electricity sales to the commercial sector rose 4.0 percent.

***Renewable energy.*** Renewable energy consumption rose 9.3 percent to 6.9 quadrillion Btu, the highest on record and an 8-percent share of total energy consumption (10.1a and 1.3). Conventional hydroelectric power, consumed primarily at electric utilities to generate electricity, accounted for 3.5 quadrillion Btu, half of the renewable energy total (10.1a). Biofuels (fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels) accounted for 2.9 quadrillion Btu of consumption. Biofuels were consumed by all sectors and were the primary form of renewable energy consumed by the transportation sector. Consumption of geothermal energy (in the form of grid-connected electricity) totaled 0.4 quadrillion Btu. Solar energy is used primarily by the residential and commercial sector, which consumed 0.06 quadrillion Btu in 1995, and by the industrial sector, which accounted for 0.01 quadrillion Btu. Wind energy is used primarily by the industrial sector, which accounted for 0.04 quadrillion Btu in 1995.

***Energy intensity.*** The energy intensity of the economy, when measured in terms of energy consumption per dollar of gross domestic product (GDP), declined in 1995 for the fourth year in a row (1.7). About 13 thousand Btu of energy were consumed for each chained (1992) dollar of GDP in 1995, compared with about 19 thousand Btu per chained (1992) dollar in the early 1970's. The energy intensity of the economy declined during the 1970's, 1980's, and 1990's due to increases in energy efficiency, conservation, the expansion of the service

sector, and the shift toward less energy-intensive industries. The Energy Policy Act of 1992 mandates additional energy efficiency standards that may further lower the energy intensity of the economy.

## Energy Production Reaches a Record Level

U.S. total energy production in 1995 rose 0.8 percent to 71.2 quadrillion Btu (1.2). Most of the increase was attributed to increased production of renewable energy and nuclear electric power. Production of renewable energy rose 0.6 quadrillion Btu to 6.6 quadrillion Btu and production of nuclear electric power rose 0.4 quadrillion Btu to 7.2 quadrillion Btu. In contrast, production of the three major fossil fuels in 1995 was below 1994 levels. Coal production fell 0.2 quadrillion Btu from the 1994 level to 21.9 quadrillion Btu, natural gas production fell 0.04 quadrillion Btu to 19.23 quadrillion Btu, and crude oil (including lease condensate) production fell 0.3 quadrillion Btu to 13.8 quadrillion Btu (the lowest level in 41 years).

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*Nuclear electric power production rose to an all-time high.*

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Coal and natural gas production each accounted for a greater share of the U.S. total than did crude oil. Coal production accounted for 31 percent of the U.S. total and dry natural gas production accounted for 27 percent, while crude oil production accounted for 19 percent.

***Crude oil and natural gas exploration.*** Exploration for crude oil and natural gas is closely tied to market conditions. In 1995, the continuing low price of crude oil reversed a modest upturn in domestic exploratory activity, which, in 1992, had fallen to the lowest levels in at least 44 years. The number of rotary rigs in operation fell from 775 in 1994 to 723 in 1995 (4.3). Exploratory wells drilled fell from 3.6 thousand to 3.5 thousand (4.5). However, the percentage of successful exploratory wells drilled rose from 38 percent in 1994 to 44 percent in 1995 (4.5).

***Petroleum production.*** Crude oil production dropped to 6.5 million barrels per day, down 2.0 percent from the level in 1994 (5.1). However, average output from U.S. refineries in 1995 rose to 16 million barrels per day (5.8). Motor gasoline, at 7.4 million barrels per day, was by far the most prevalent product. The refinery utilization rate was 92 percent, the second highest rate in 22 years (5.9).

***Petroleum stocks.*** At year end, the Strategic Petroleum Reserve held 592 million barrels of crude oil (5.15), enough to replace petroleum net imports for 75 days. Privately held stocks of crude oil totaled 302 million barrels (5.14). Privately held stocks of petroleum products totaled 668 million barrels.

***Natural gas production.*** Gross withdrawals of natural gas in 1995 totaled 24 trillion cubic feet, and dry gas production totaled 19 trillion cubic feet (6.2). U.S. total gross withdrawals include a small but growing amount of methane produced from coalbeds. In 1994, gross withdrawals of coalbed methane totaled about 851 billion cubic feet,[1] an amount equal to 5 percent of U.S. total dry production. However, the rate of increase in coalbed methane reserves slowed after 1992, when Federal tax incentives for new coalbed methane wells expired. In 1994, coalbed methane reserves declined for the first time since data collection began in 1988. Coalbed methane reserves accounted for 6 percent of U.S. natural gas total reserves in 1994.

***Coal production.*** Domestic coal production in 1995 totaled 1,030 million short tons (7.1). Production of western coal rose to 488 million short tons, 47 percent of the total (7.2). The growth in western coal was due in part to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in the West. In addition, surface mining, with its higher productivity, is much more prevalent in the West.

***Coal stocks.*** Year-end 1995 coal stocks remained at the year-end 1994 level of 169 million short tons (7.5). Electric utilities held three-fourths of the coal, and coal producers and distributors held most of the remainder.

***Nuclear electric power production.*** In 1995, nuclear electric power production rose to an all-time high. Nuclear electricity net generation increased 5.2 percent to 673 billion kilowatthours, the highest ever, and the nuclear portion of domestic electricity net generation rose from 22.0 percent in 1994 to a record 22.5 percent in 1995 (9.2). The 1995 capacity factor of 78 percent also was the highest ever recorded. However, the number of operable nuclear generating units remained at 109, two fewer than the number in 1990 and 1991. One unit, Watts Bar 1, was licensed for startup in 1995, but construction on the remaining six units holding construction permits had been halted or canceled. The year-end 1995

[1]Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1994 Annual Report*, DOE/EIA-0216(94) (Washington, DC, October 1995), p. 34.

net summer capability of operable units remained at the year-end 1994 level of 99.1 million kilowatthours, 0.5 million kilowatthours below the peak capability recorded in 1990 and 1991.

***Hydroelectric power production.*** Conventional hydroelectric power production at electric utilities (which excludes hydroelectric pumped storage) rose from 247 billion kilowatthours in 1994 to 296 billion kilowatthours in 1995 (8.3). Hydroelectric pumped storage (total production at pumped storage facilities minus the energy used for pumping) was a negative 3 billion kilowatthours. The amount of electricity generated from renewable energy (excluding hydroelectric power) at electric utilities fell from 9 billion kilowattours in 1994 to 6 billion kilowatthours in 1995.

## Energy Net Imports Decline

U.S. net imports of energy fell to 17.8 quadrillion Btu in 1995, a decrease of 3.9 percent from 1994's record level (1.4). Changes in the trade volumes of both petroleum and coal led to the decline. Petroleum net imports decreased 1.8 percent to 16.9 quadrillion Btu and coal net exports increased 27 percent to 2.1 quadrillion Btu. Natural gas net imports rose 4.4 percent to 2.6 quadrillion Btu.

Crude oil net imports (including imports for the Strategic Petroleum Reserve) rose to an all-time high in 1995 of 7.1 million barrels per day (5.3 and 5.5), but net imports of petroleum products fell 32 percent to 0.7 million barrels per day. The petroleum products registering the highest volumes of net imports in 1995 were unfinished oils, motor gasoline, and residual fuel oil. Petroleum coke was the primary net export.

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***Crude oil net imports rose to an all-time high in 1995 of 7.1 million barrels per day.***

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U.S. net imports of petroleum totaled 7.9 million barrels per day in 1995 (5.7). Members of the Organization of Petroleum Exporting Countries (OPEC) supplied 4.2 million barrels per day, over half of the total. Net imports from Venezuela, Saudi Arabia, and Nigeria were 1.5 million barrels per day, 1.3 million barrels per day, and 0.6 million barrels per day, respectively.

The remaining 3.7 million barrels per day of U.S. petroleum net imports came primarily from Canada, which supplied 1.3 million barrels per day, and Mexico, which supplied 0.9 million barrels per day. The United Kingdom supplied 0.4 million barrels per day.

U.S. dependence on foreign suppliers of petroleum decreased by 1.0 percentage point in 1995 (5.7). Net imports from all countries fell to a 44.5-percent share of petroleum consumption. Dependence on net imports from OPEC members alone fell 0.2 percentage points to a 23.7-percent share of petroleum consumption.

Although petroleum dominated U.S. trade in energy, imports and exports of other energy sources played an important role:

- ***Natural Gas.*** Natural gas net imports rose to 2.6 trillion cubic feet, due primarily to increased net imports from Canada (6.3). Trade with Canada was facilitated by the completion of the Iroquois transportation system in January 1992. Canadian natural gas exports to the U.S. market rose 5.7 percent to 2.7 trillion cubic feet. U.S. exports to Canada decreased 38 percent to 33 billion cubic feet.
- ***Coal.*** Coal remained the primary U.S. energy export. Coal exports rose 24 percent to 89 million short tons in 1995, rebounding from the 1994 level, which was the lowest in 15 years (7.1). Coal exports to almost all countries increased. Japan, Canada, and Italy remained the three largest foreign purchasers of U.S. coal.
- ***Electricity.*** Net imports of electricity totaled 37 billion kilowatthours in 1995 (8.1). Electricity net imports contributed only a small share of U.S. electricity consumption.

## Energy Prices Remained Low

Although the U.S. refiners' real[2] composite acquisition cost of crude oil rose to $16.03 per barrel, up from $14.85 in 1994, the cost remained well below the high costs of the 1970's and 1980's.

The end-use prices, excluding taxes, of most petroleum products also increased in 1995 (5.20). The average price of all types of motor gasoline rose from 74 cents per gallon in 1994 to 77 cents per gallon in 1995. Aviation gasoline, kerosene-type jet fuel, residual fuel oil, and

[2]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.

No. 2 diesel oil average prices, excluding taxes, also increased. In contrast, the average prices per gallon, excluding taxes, of kerosene, propane, and No. 2 fuel oil declined in 1995.

The average wellhead real price of all categories of natural gas fell 17 percent to $1.48 per thousand cubic feet (6.8). Lower costs of producing and transporting natural gas benefited consumers. The average price, in real terms, paid by residential consumers was down 7.5 percent from the 1994 price. Corresponding prices paid by the commercial, electric utilities, and industrial sectors were down 10 percent, 14 percent, and 15 percent, respectively (6.9 and E1).

The average real price of bituminous coal and lignite at the minemouth fell to $17.67 per short ton, down for the sixteenth year in a row (7.8). The real price of coal at electric utilities, where most coal is consumed, was $25.20 per short ton, down from $26.70 per short ton in 1994.

The weighted average real price of electricity to all sectors declined slightly to 6.4 cents per kilowatthour in 1995 (8.11). The average real price of electricity sold to the residential sector, where prices have usually been the highest, was 7.8 cents per kilowatthour, down 2.5 percent from the real price in 1994. The commercial sector price fell 1.4 percent to 7.2 cents per kilowatthour in 1995. Industrial customers continued to pay prices that were favorable compared with prices in other sectors. In 1995, the real price of electricity sold to industrial users was 4.4 cents per kilowatthour, down 4.3 percent from the price in 1994.

# 1. Energy Overview

## Production

Historically, three fossil fuels have accounted for the bulk of domestic energy production, which by 1995 totaled 71 quadrillion Btu (1.2).* Coal accounted for the largest share of domestic energy production in 1949-1951 and, after a long hiatus, again in 1982 and in 1984 through 1995. In the interim, first crude oil and then natural gas dominated domestic production. In 1995, coal production totaled 22 quadrillion Btu. Dry natural gas production totaled 19 quadrillion Btu and crude oil production totaled 14 quadrillion Btu. Natural gas plant liquids accounted for another 2.4 quadrillion Btu.

Net generation of electricity by electric utilities increased throughout the 1949-through-1995 period (8.1), registering only two year-to-year declines (during the 1982 recession and again in 1992). However, the rate of growth of electricity net generation slowed during the 47-year period. From 1949 through 1979, the annual growth rate averaged 7.1 percent, whereas from 1980 through 1995, the annual growth rate averaged 1.8 percent. After the mid-1970's, coal and nuclear fuels provided increasing shares of fuel input for electricity generation, displacing substantial quantities of petroleum and, to a lesser extent, natural gas (8.3).

Hydroelectric generation (conventional and pumped storage) accounted for over 1.4 quadrillion Btu of electricity in 1949 and from the 1970's through 1995 usually provided about 3 quadrillion Btu per year (1.2). However, in 1988, the second year of drought, hydroelectric generation totaled only 2.3 quadrillion Btu. In 1995, it totaled 3.2 quadrillion Btu.

Other renewable energy sources also contributed to the domestic energy supply. Biofuels, a category which includes wood and waste, contributed 2.9 quadrillion Btu to the 1995 total (1.2). Geothermal, solar, and wind energy combined contributed 0.5 quadrillion Btu. Renewable energy production (including conventional hydroelectric power and excluding hydroelectric pumped storage) totaled 6.6 quadrillion Btu, 9.3 percent of U.S. total energy production.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Consumption

Energy consumption more than doubled during the 1949-through-1973 period, increasing from 30 quadrillion Btu in 1949 to 74 quadrillion Btu in 1973 (1.3), and the U.S. economy grew at about the same rate. The domestic energy market was dominated by rapid growth in petroleum and natural gas consumption, which more than tripled during the period. After the 1973 oil shock, energy consumption fluctuated, influenced by dramatic changes in oil prices, changes in the rate of growth of the domestic economy, and such factors as concerns about the effect of energy use on the environment. The post-1973 low point of energy consumption, 71 quadrillion Btu, occurred in 1983 following a period of very high oil prices. The highest level of energy

### Indicators of Energy Intensity

The relationship between total energy consumption and real gross domestic product (GDP) is a traditional indicator of the energy intensity of the economy. In 1970, 20 thousand Btu of energy were consumed for each chained (1992) dollar of GDP (1.7). Higher energy prices in the early 1970's led to increases in energy efficiency and a significant restructuring of the energy-intensive activities of the manufacturing sector. In 1985, the energy intensity of the economy as a whole fell below 14 thousand Btu per chained (1992) dollar, where it remained through 1995.

A second indicator of energy intensity is per capita consumption. Throughout the 1960's and early 1970's, the growth of end-use energy consumption was greater than the growth of the population (1.5). Per capita consumption rose from 212 million Btu in 1960 to a peak of 285 million Btu in 1973. Thereafter, per capita consumption trended downward to as low as 226 million Btu in 1983. In the 1990's, low petroleum prices encouraged energy use, and end-use energy consumption rose to 264 million Btu per capita in 1995.[1]

[1]The inclusion of non-electric consumption of renewable energy in the totals of U.S. energy consumption for 1990 through 1994 increased the per capita values.

consumption, 91 quadrillion Btu,[2] occurred in 1995, following several years when oil prices were low.

The composition of demand after 1973 reflected an increasing emphasis on electricity generated by coal, nuclear, and renewable energy sources and on non-electric utility use of renewable sources. In 1973, petroleum and natural gas accounted for 77 percent of total energy consumption; by 1995, their share had declined to 63 percent.[3]

## Energy Prices in a Volatile Market

Since the mid-1970's, changes in fossil fuel prices have become more frequent and more pronounced (3.1). Prior to the oil embargo of 1973-1974, the composite real price[4] per million Btu of crude oil, natural gas, and coal had declined to a post-World War II low of $1.03 in 1968 and 1969. In 1974, however, the real price rose to $1.76 and eventually peaked at $4.17 in 1981 after a second round of crude oil price increases. Thereafter, overproduction of crude oil began to affect energy prices and, when crude oil prices plunged in 1986, the composite real price of the major fossil fuels fell to $2.05. In 1995, the composite price was $1.39, the lowest in 22 years.

Throughout the 1949-through-1995 period, changes in the real price of oil dominated movements in the composite index. The real price of oil trended downward between 1959 and 1970 and then rose sharply in 1974 and again in 1979 through 1981. Thereafter, in the face of shrinking demand and excess production, price trends reversed sharply. Precipitous declines in 1986 and 1988 brought the real price of crude oil in 1988 to $2.52 per million Btu, the lowest level since 1973. In 1989, the price rose to $3.05. In 1990, the Iraqi invasion of Kuwait contributed to an increase in crude oil prices to $3.69 per million Btu. In 1991, however, the ability of producers to supply replacement oil, coupled with a worldwide economic recession that depressed petroleum demand, led to a decrease in crude oil prices to $2.93 per million Btu. In 1995, the real price of oil was $2.35 per million Btu.

[2]U.S. total energy consumption in 1990 through 1995 was roughly 3 quadrillion Btu higher due to the expanded coverage of non-electric utility use of renewable energy. Even without the additional renewable energy consumption, however, 1995 U.S. total energy consumption was the highest on record.

[3]The 1995 share was lower than it would have been had non-electric utility consumption of renewable energy not been included in U.S. total energy consumption.

[4]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.

Prices of coal and natural gas were much less volatile than those of oil. Coal markets are generally less vulnerable to supply disruptions than are oil markets, where the output and pricing policies of the Organization of Petroleum Exporting Countries (OPEC) were a major influence during much of the 1973-through-1995 period. Natural gas prices were subject to substantial State and Federal regulation. Throughout the 1970's, regulation dampened the response of natural gas prices relative to the oil price movement. However, the weakening of crude oil prices after 1985 was severe enough to trigger declines in the prices of the other fossil fuels, particularly that of natural gas. In 1995, the real price of crude oil per million Btu of $2.35 was 56 percent below the 1985 price (3.1). The real price of natural gas was 53 percent lower, and the real price of bituminous coal and lignite was 43 percent lower, than their respective prices in 1985.

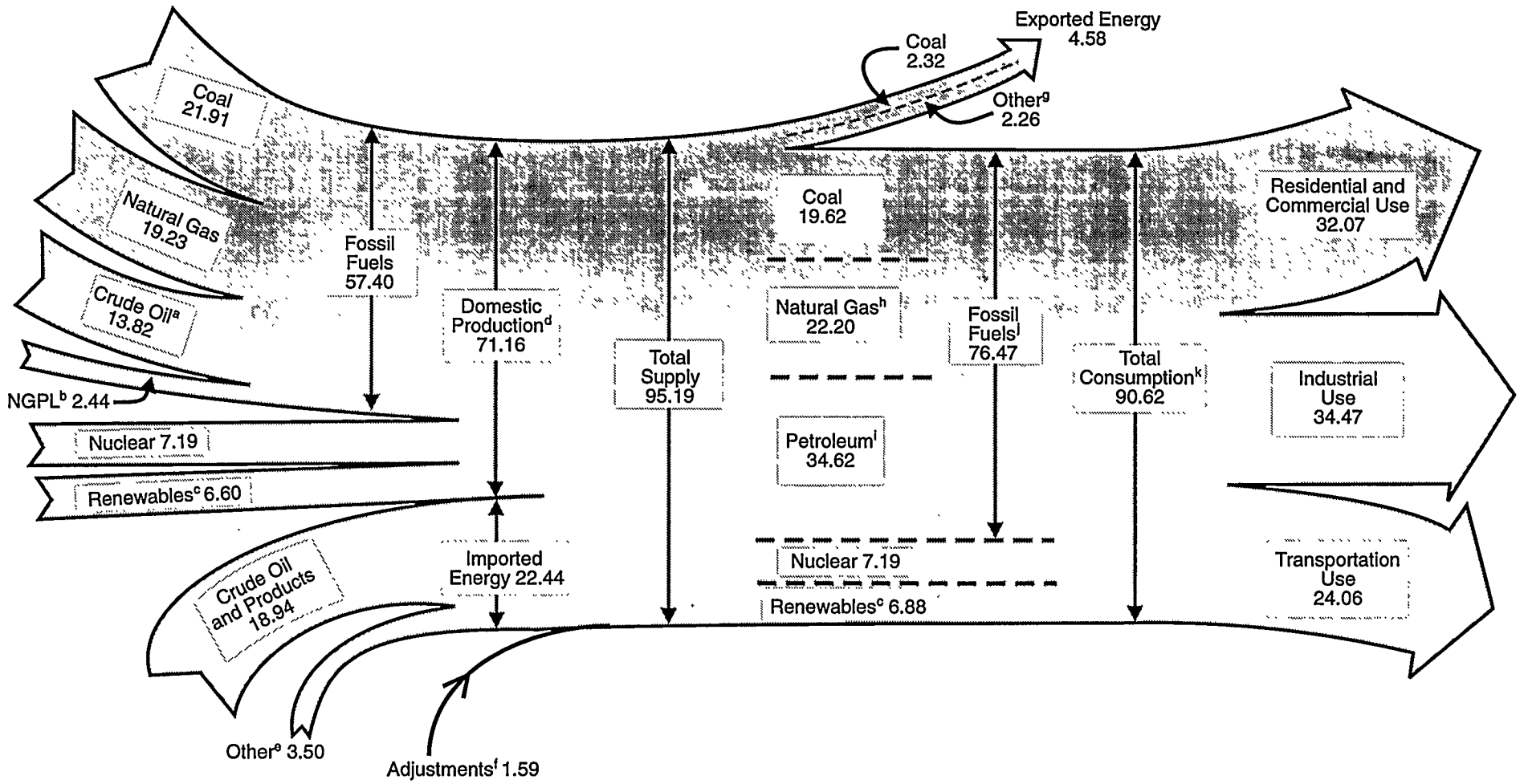
## Changing Patterns of Trade

From 1958 forward, the United States consumed more energy than it produced, and the difference was met by energy imports (1.2, 1.3, and 1.4). Net imports of energy (primarily petroleum) grew rapidly through 1973, as demand for cheap foreign oil eroded quotas on petroleum imports. The oil embargo of 1973-1974, coupled with the increase in the price of crude oil, interrupted growth in petroleum net imports; nevertheless, they climbed to a peak of 18 quadrillion Btu in 1977 (1.4). That year, U.S. dependence on foreign sources of petroleum reached an all-time high of 47 percent (5.7). A second round of price increases in 1979 through 1981 suppressed demand for foreign oil. In 1985, petroleum net imports totaled 9.0 quadrillion Btu, and U.S. dependence fell to 27 percent of consumption (1.4 and 5.7). Subsequently, petroleum net imports increased every year through 1989, when U.S. dependence on foreign sources of petroleum reached 42 percent of consumption. In 1995, the fifth consecutive year of low crude oil prices, petroleum net imports rose to 17 quadrillion Btu and U.S. dependence on them equaled 45 percent—the second highest level in 18 years.

Natural gas trade was limited to border countries until the advent of shipping natural gas in liquefied form in the late 1960's. In 1995, natural gas net imports reached the record level of 2.6 quadrillion Btu (1.4).

Throughout the 1949-through-1995 period, the United States was a net exporter of coal (1.4). In 1995, coal net exports totaled 2.1 quadrillion Btu.

## Diagram 1. Energy Flow, 1995
(Quadrillion Btu)



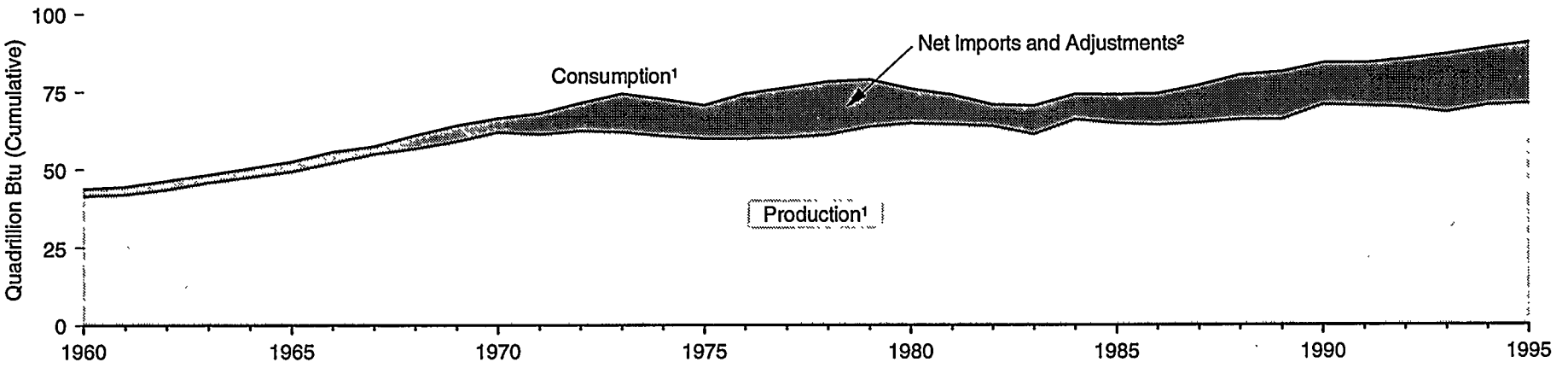

[a] Includes lease condensate.
[b] Natural gas plant liquids.
[c] Biofuels, conventional hydroelectric power, geothermal energy, solar energy, and wind energy.
[d] Includes -0.3 quadrillion Btu for hydroelectric pumped storage.
[e] Natural gas, coal, coal coke, and electricity.
[f] Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.
[g] Crude oil, petroleum products, natural gas, electricity, and coal coke.
[h] Includes supplemental gaseous fuels.
[i] Petroleum products, including natural gas plant liquids and crude oil consumed directly as fuel.
[j] Includes 0.03 quadrillion Btu for coal coke net imports.
[k] Includes 0.11 quadrillion Btu for net imported electricity that was generated from nonrenewable energy sources and -0.03 quadrillion Btu for hydroelectric pumped storage.

Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

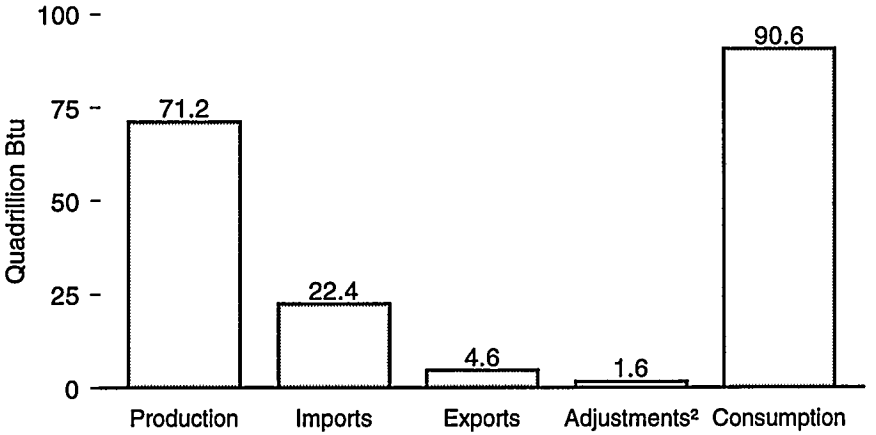
Sources: Tables 1.1 and 2.1.

# Figure 1.1 Energy Overview

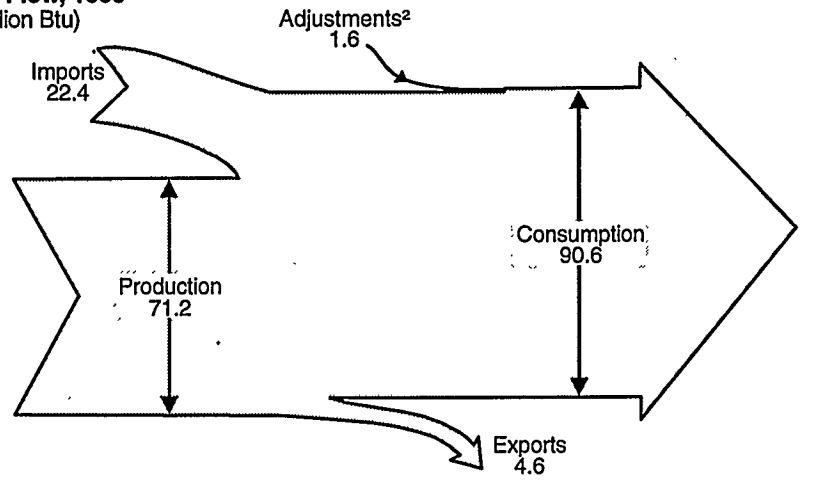
**Overview, 1960-1995**




**Overview, 1995**




**Energy Flow, 1995**
(Quadrillion Btu)




¹ There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

² Stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.

Note: Data for 1995 are preliminary.
Source: Table 1.1.

# Table 1.1 Energy Overview, Selected Years, 1960-1995

(Quadrillion Btu)

| Activity and Energy Source | 1960 | 1970 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Production** | 41.49 | 62.07 | 64.76 | 64.42 | 63.96 | 61.28 | 65.96 | 64.87 | 64.35 | 64.95 | 66.10 | 66.13 | R,1 70.75 | R 70.41 | R 69.96 | 68.32 | R 70.62 | 71.16 |
| Fossil Fuels | 39.87 | 59.19 | 59.01 | 58.53 | 57.46 | 54.42 | 58.85 | 57.54 | 56.58 | 57.17 | 57.87 | 57.47 | 58.56 | 57.83 | 57.55 | R 55.71 | R 57.83 | 57.40 |
| Coal | 10.82 | 14.61 | 18.60 | 18.38 | 18.64 | 17.25 | 19.72 | 19.33 | 19.51 | 20.14 | 20.74 | 21.35 | 22.46 | 21.59 | 21.59 | 20.22 | R 22.07 | 21.91 |
| Natural Gas (Dry) | 12.66 | 21.67 | 19.91 | 19.70 | 18.32 | 16.59 | 18.01 | 16.98 | 16.54 | 17.14 | 17.60 | 17.85 | 18.36 | 18.23 | 18.38 | R 18.58 | R 19.27 | 19.23 |
| Crude Oil [2] | 14.93 | 20.40 | 18.25 | 18.15 | 18.31 | 18.39 | 18.85 | 18.99 | 18.38 | 17.67 | 17.28 | 16.12 | 15.57 | 15.70 | 15.22 | 14.49 | R 14.10 | 13.82 |
| Natural Gas Plant Liquids | 1.46 | 2.51 | 2.25 | 2.31 | 2.19 | 2.18 | 2.27 | 2.24 | 2.15 | 2.22 | 2.26 | 2.16 | 2.17 | 2.31 | 2.36 | 2.41 | 2.39 | 2.44 |
| Nuclear Electric Power [3] | 0.01 | 0.24 | 2.74 | 3.01 | 3.13 | 3.20 | 3.55 | 4.15 | 4.47 | 4.91 | 5.66 | 5.68 | 6.16 | 6.58 | 6.61 | 6.52 | R 6.84 | 7.19 |
| Hydroelectric Pumped Storage [4] | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | -0.04 | -0.05 | -0.04 | -0.04 | R -0.03 | -0.03 |
| Renewable Energy | 1.61 | 2.65 | 3.01 | 2.88 | 3.37 | 3.66 | 3.56 | 3.18 | 3.30 | 2.88 | 2.57 | 2.98 | R,1 6.06 | R 6.05 | R 5.84 | R 6.13 | R 5.99 | 6.60 |
| Conventional Hydroelectric Power | 1.61 | 2.63 | 2.90 | 2.76 | 3.27 | 3.53 | 3.39 | 2.97 | 3.07 | 2.63 | 2.33 | 2.77 | [6] 3.01 | 2.98 | 2.61 | 2.88 | 2.67 | 3.20 |
| Geothermal Energy | (s) | 0.01 | 0.11 | 0.12 | 0.10 | 0.13 | 0.16 | 0.20 | 0.22 | 0.23 | 0.22 | 0.20 | R,1 0.34 | R 0.35 | R 0.37 | R 0.38 | R 0.38 | 0.36 |
| Biofuels [7] | (s) | (s) | (s) | (s) | (s) | (s) | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | [1] 2.63 | 2.64 | R 2.79 | R 2.78 | R 2.85 | 2.94 |
| Solar Energy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | [1] 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| Wind Energy | 0 | 0 | 0 | 0 | 0 | (s) | (s) | (s) | (s) | (s) | (s) | (s) | [1] 0.02 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 |
| **Imports** | 4.23 | 8.39 | 15.97 | 13.97 | 12.09 | 12.03 | 12.77 | 12.10 | 14.44 | 15.76 | 17.56 | 18.95 | 18.99 | 18.58 | R 19.66 | R 21.54 | R 22.71 | 22.44 |
| Natural Gas | 0.16 | 0.85 | 1.01 | 0.92 | 0.95 | 0.94 | 0.85 | 0.95 | 0.75 | 0.99 | 1.30 | 1.39 | 1.55 | 1.80 | 2.16 | 2.40 | R 2.68 | 2.80 |
| Crude Oil [8] | 2.20 | 2.81 | 11.19 | 9.34 | 7.42 | 7.08 | 7.30 | 6.81 | 9.00 | 10.07 | 11.03 | 12.60 | 12.77 | 12.55 | 13.25 | 14.75 | R 15.34 | 15.74 |
| Petroleum Products [9] | 1.80 | 4.66 | 3.46 | 3.30 | 3.36 | 3.57 | 4.13 | 3.80 | 4.20 | 4.10 | 4.72 | 4.57 | 4.35 | 3.79 | 3.71 | 3.76 | R 3.91 | 3.20 |
| Other [10] | 0.07 | 0.07 | 0.31 | 0.42 | 0.36 | 0.44 | 0.49 | 0.54 | 0.49 | 0.61 | 0.52 | 0.40 | 0.32 | R 0.44 | R 0.53 | R 0.63 | R 0.78 | 0.70 |
| **Exports** | 1.48 | 2.66 | 3.72 | 4.33 | 4.63 | 3.72 | 3.80 | 4.23 | 4.06 | 3.85 | 4.42 | 4.77 | 4.91 | 5.22 | 5.02 | 4.35 | R 4.12 | 4.58 |
| Coal | 1.02 | 1.94 | 2.42 | 2.94 | 2.79 | 2.04 | 2.15 | 2.44 | 2.25 | 2.09 | 2.50 | 2.64 | 2.77 | 2.85 | 2.68 | 1.96 | 1.88 | 2.32 |
| Crude Oil | 0.43 | 0.55 | 1.16 | 1.26 | 1.73 | 1.57 | 1.54 | 1.66 | 1.67 | 1.63 | 1.74 | 1.84 | 1.82 | 2.13 | 2.01 | 2.12 | 1.99 | 1.99 |
| Other [11] | 0.03 | 0.18 | 0.14 | 0.12 | 0.11 | 0.11 | 0.11 | 0.14 | 0.14 | 0.13 | 0.18 | 0.29 | 0.31 | 0.24 | 0.33 | 0.27 | R 0.26 | 0.27 |
| **Adjustments** [12] | -0.43 | -1.37 | -1.05 | -0.08 | -0.57 | 0.94 | -0.78 | 1.24 | -0.44 | 0.03 | 0.96 | 1.02 | -0.67 | R 0.27 | R 0.65 | R 1.51 | R -0.32 | 1.59 |
| **Consumption** [13] | 43.80 | 66.43 | 75.96 | 73.99 | 70.85 | 70.52 | 74.14 | 73.98 | 74.30 | 76.89 | 80.22 | 81.33 | R,1 84.17 | R 84.05 | R 85.26 | R 87.03 | R 88.90 | 90.62 |
| Fossil Fuels | 42.14 | 63.52 | 69.98 | 67.75 | 64.04 | 63.29 | 66.62 | 66.22 | 66.15 | 68.63 | 71.66 | 72.55 | 71.96 | 71.23 | 72.55 | R 74.12 | R 75.64 | 76.47 |
| Coal | 9.84 | 12.26 | 15.42 | 15.91 | 15.32 | 15.89 | 17.07 | 17.48 | 17.26 | 18.01 | 18.85 | 18.93 | 19.10 | 18.77 | 18.87 | 19.43 | 19.54 | 19.62 |
| Coal Coke Net Imports | -0.01 | -0.06 | -0.04 | -0.02 | -0.02 | -0.02 | -0.01 | -0.01 | -0.02 | 0.01 | 0.04 | 0.03 | (s) | 0.01 | 0.03 | 0.02 | 0.02 | 0.03 |
| Natural Gas [14] | 12.39 | 21.79 | 20.39 | 19.93 | 18.51 | 17.36 | 18.51 | 17.83 | 16.71 | 17.74 | 18.55 | 19.38 | 19.30 | 19.61 | 20.13 | R 20.83 | R 21.34 | 22.20 |
| Petroleum [15] | 19.92 | 29.52 | 34.20 | 31.93 | 30.23 | 30.05 | 31.05 | 30.92 | 32.20 | 32.87 | 34.22 | 34.21 | 33.55 | 32.85 | 33.53 | 33.84 | R 34.73 | 34.62 |
| Nuclear Electric Power | 0.01 | 0.24 | 2.74 | 3.01 | 3.13 | 3.20 | 3.55 | 4.15 | 4.47 | 4.91 | 5.66 | 5.68 | 6.16 | 6.58 | 6.61 | 6.52 | R 6.84 | 7.19 |
| Hydroelectric Pumped Storage [4] | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | ([5]) | -0.04 | -0.05 | -0.04 | -0.04 | R -0.03 | -0.03 |
| Renewable Energy | 1.66 | 2.67 | 3.23 | 3.23 | 3.68 | 4.03 | 3.97 | 3.61 | 3.68 | 3.36 | 2.90 | 3.10 | R,1 6.16 | R 6.27 | R 6.11 | R 6.40 | R 6.30 | 6.88 |
| Conventional Hydroelectric Power [16] | 1.66 | 2.65 | 3.12 | 3.11 | 3.57 | 3.90 | 3.80 | 3.40 | 3.45 | 3.12 | 2.66 | 2.88 | [6] 3.10 | R 3.18 | R 2.85 | R 3.14 | R 2.96 | 3.46 |
| Geothermal Energy [17] | (s) | 0.01 | 0.11 | 0.12 | 0.10 | 0.13 | 0.16 | 0.20 | 0.22 | 0.23 | 0.22 | 0.20 | R,1 0.34 | R 0.35 | R 0.37 | R 0.38 | R 0.38 | 0.36 |
| Biofuels [7] | (s) | (s) | (s) | (s) | (s) | (s) | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 2.63 | 2.64 | R 2.79 | R 2.78 | R 2.85 | 2.94 |
| Solar Energy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 |
| Wind Energy | 0 | 0 | 0 | 0 | 0 | (s) | (s) | (s) | (s) | (s) | (s) | (s) | [1] 0.02 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 |

[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.
[2] Includes lease condensate.
[3] See Note 1 at end of section.
[4] Represents total pumped storage facility production minus energy used for pumping.
[5] Through 1989, pumped storage is included in conventional hydroelectric power.
[6] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
[7] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[8] Includes imports of crude oil for the Strategic Petroleum Reserve, which began in 1977.
[9] Includes imports of unfinished oils and natural gas plant liquids.
[10] "Other" imports are coal, electricity, and coal coke.
[11] "Other" exports are natural gas, petroleum products, electricity, and coal coke.
[12] A balancing item. Includes stock changes, losses, gains, miscellaneous blending components, and unaccounted-for supply.
[13] From 1990, the portion of net imports of electricity that is derived from nonrenewable energy sources is included directly in "Consumption."
[14] Includes supplemental gaseous fuels.
[15] Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[16] Through 1989, includes all net imports of electricity. From 1990, includes only the portion of net imports of electricity that is derived from hydroelectric power.
[17] Includes electricity imports from Mexico that are derived from geothermal energy.

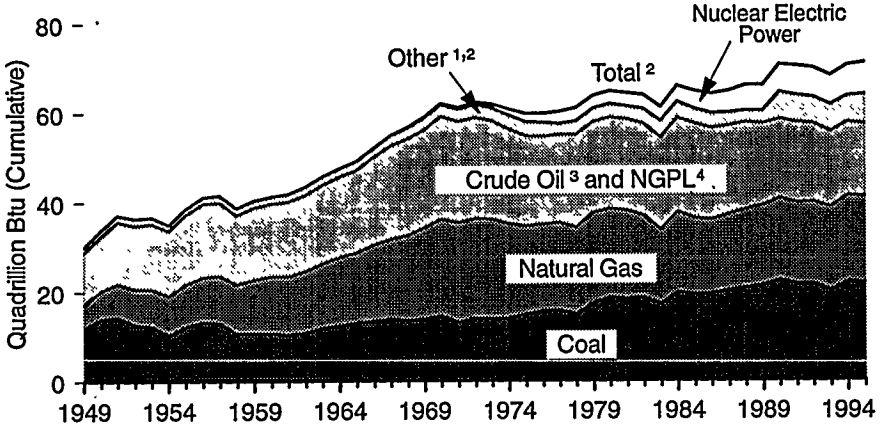
R=Revised data. P=Preliminary data. (s)=Less than 0.005 quadrillion Btu.

Note: Totals may not equal sum of components due to independent rounding.

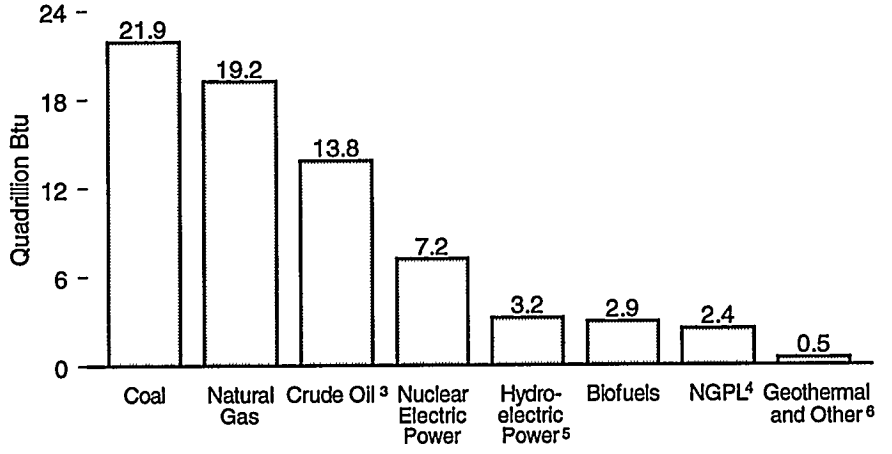
Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.4, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

# Figure 1.2 Energy Production by Source

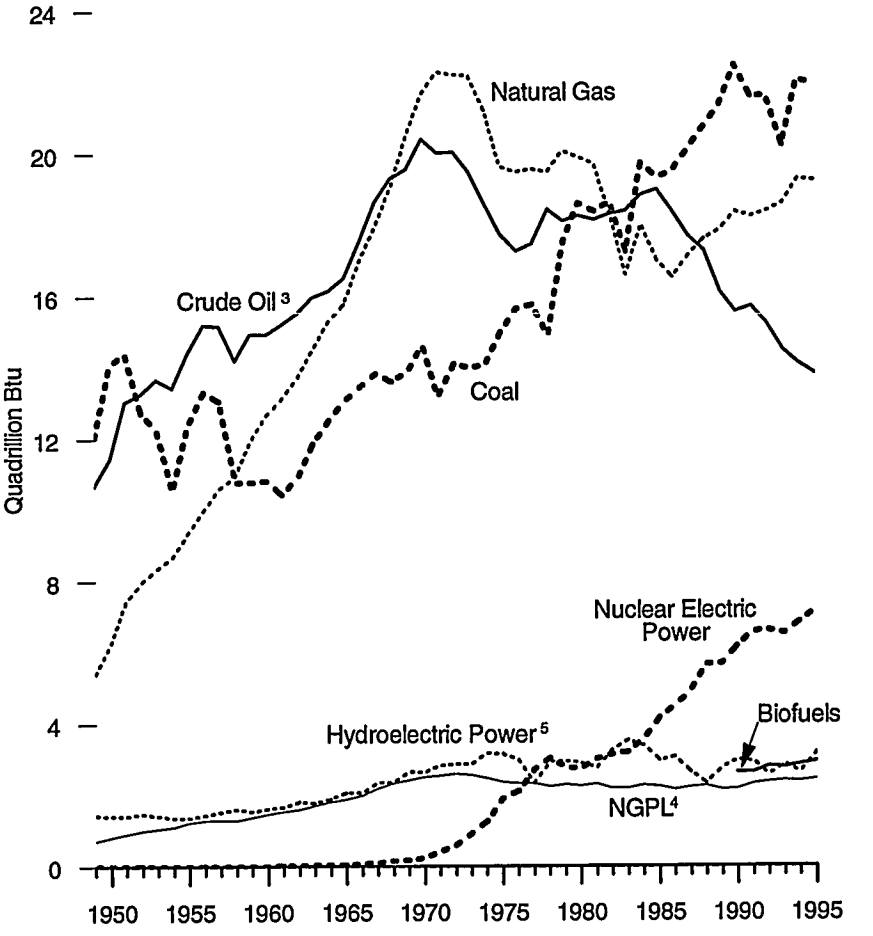
### By Source, 1949-1995




### By Source, 1995




### By Major Source, 1949-1995




[1] "Other" is renewable energy and pumped-storage hydroelectric power.

[2] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

[3] Includes lease condensate.

[4] Natural gas plant liquids.

[5] Conventional and pumped-storage hydroelectric power.

[6] "Other" is solar energy and wind energy.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 1.2.

# Table 1.2 Energy Production by Source, 1949-1995

(Quadrillion Btu)

| Year | Fossil Fuels | | | | | Nuclear Electric Power [2] | Hydroelectric Pumped Storage [3] | Renewable Energy | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal | Natural Gas (Dry) | Crude Oil [1] | Natural Gas Plant Liquids | Total Fossil Fuels | | | Conventional Hydroelectric Power | Geothermal Energy | Biofuels [4] | Solar Energy | Wind Energy | Total Renewable Energy | |
| 1949 | 11.974 | 5.377 | 10.683 | 0.714 | 28.748 | 0 | (5) | 1.425 | 0 | 0.006 | 0 | 0 | 1.431 | 30.179 |
| 1950 | 14.060 | 6.233 | 11.447 | 0.823 | 32.563 | 0 | (5) | 1.415 | 0 | 0.005 | 0 | 0 | 1.421 | 33.983 |
| 1951 | 14.419 | 7.416 | 13.037 | 0.920 | 35.792 | 0 | (5) | 1.424 | 0 | 0.005 | 0 | 0 | 1.429 | 37.221 |
| 1952 | 12.735 | 7.964 | 13.281 | 0.998 | 34.977 | 0 | (5) | 1.466 | 0 | 0.006 | 0 | 0 | 1.472 | 36.449 |
| 1953 | 12.278 | 8.339 | 13.671 | 1.062 | 35.349 | 0 | (5) | 1.413 | 0 | 0.005 | 0 | 0 | 1.418 | 36.767 |
| 1954 | 10.542 | 8.682 | 13.427 | 1.113 | 33.764 | 0 | (5) | 1.360 | 0 | (s) | 0 | 0 | 1.363 | 35.127 |
| 1955 | 12.370 | 9.345 | 14.410 | 1.240 | 37.364 | 0 | (5) | 1.360 | 0 | (s) | 0 | 0 | 1.363 | 38.727 |
| 1956 | 13.306 | 10.002 | 15.180 | 1.283 | 39.771 | 0 | (5) | 1.435 | 0 | (s) | 0 | 0 | 1.436 | 41.208 |
| 1957 | 13.061 | 10.605 | 15.178 | 1.289 | 40.133 | (s) | (5) | 1.516 | 0 | (s) | 0 | 0 | 1.518 | 41.651 |
| 1958 | 10.783 | 10.942 | 14.204 | 1.287 | 37.216 | (s) | (5) | 1.592 | 0 | (s) | 0 | 0 | 1.594 | 38.812 |
| 1959 | 10.778 | 11.952 | 14.933 | 1.383 | 39.045 | (s) | (5) | 1.548 | 0 | (s) | 0 | 0 | 1.550 | 40.598 |
| 1960 | 10.817 | 12.656 | 14.935 | 1.461 | 39.869 | 0.006 | (5) | 1.608 | (s) | (s) | 0 | 0 | 1.610 | 41.485 |
| 1961 | 10.447 | 13.105 | 15.206 | 1.549 | 40.307 | 0.020 | (5) | 1.656 | (s) | (s) | 0 | 0 | 1.660 | 41.987 |
| 1962 | 10.901 | 13.717 | 15.522 | 1.593 | 41.732 | 0.026 | (5) | 1.816 | (s) | (s) | 0 | 0 | 1.820 | 43.578 |
| 1963 | 11.849 | 14.513 | 15.966 | 1.709 | 44.037 | 0.038 | (5) | 1.771 | (s) | (s) | 0 | 0 | 1.776 | 45.852 |
| 1964 | 12.524 | 15.298 | 16.164 | 1.803 | 45.789 | 0.040 | (5) | 1.886 | 0.005 | (s) | 0 | 0 | 1.892 | 47.721 |
| 1965 | 13.055 | 15.775 | 16.521 | 1.883 | 47.235 | 0.043 | (5) | 2.059 | (s) | (s) | 0 | 0 | 2.066 | 49.344 |
| 1966 | 13.468 | 17.011 | 17.561 | 1.996 | 50.036 | 0.064 | (5) | 2.062 | (s) | (s) | 0 | 0 | 2.069 | 52.169 |
| 1967 | 13.826 | 17.943 | 18.651 | 2.177 | 52.597 | 0.088 | (5) | 2.347 | 0.007 | (s) | 0 | 0 | 2.357 | 55.043 |
| 1968 | 13.608 | 19.068 | 19.308 | 2.321 | 54.306 | 0.142 | (5) | 2.349 | 0.009 | (s) | 0 | 0 | 2.362 | 56.809 |
| 1969 | 13.864 | 20.446 | 19.556 | 2.420 | 56.286 | 0.154 | (5) | 2.648 | 0.013 | (s) | 0 | 0 | 2.665 | 59.104 |
| 1970 | 14.607 | 21.666 | 20.401 | 2.512 | 59.186 | 0.239 | (5) | 2.634 | 0.011 | (s) | 0 | 0 | 2.649 | 62.074 |
| 1971 | 13.185 | 22.280 | 20.033 | 2.544 | 58.041 | 0.413 | (5) | 2.824 | 0.012 | (s) | 0 | 0 | 2.839 | 61.294 |
| 1972 | 14.091 | 22.208 | 20.041 | 2.598 | 58.938 | 0.584 | (5) | 2.864 | 0.031 | (s) | 0 | 0 | 2.899 | 62.420 |
| 1973 | 13.993 | 22.187 | 19.493 | 2.569 | 58.242 | 0.910 | (5) | 2.861 | 0.043 | (s) | 0 | 0 | 2.907 | 62.060 |
| 1974 | 14.074 | 21.210 | 18.575 | 2.471 | 56.331 | 1.272 | (5) | 3.177 | 0.053 | (s) | 0 | 0 | 3.232 | 60.835 |
| 1975 | 14.990 | 19.640 | 17.729 | 2.374 | 54.734 | 1.900 | (5) | 3.155 | 0.070 | (s) | 0 | 0 | 3.227 | 59.860 |
| 1976 | 15.654 | 19.480 | 17.262 | 2.327 | 54.723 | 2.111 | (5) | 2.976 | 0.078 | (s) | 0 | 0 | 3.057 | 59.892 |
| 1977 | 15.755 | 19.565 | 17.454 | 2.327 | 55.101 | 2.702 | (5) | 2.333 | 0.077 | 0.005 | 0 | 0 | 2.416 | 60.219 |
| 1978 | 14.910 | 19.485 | 18.434 | 2.245 | 55.074 | 3.024 | (5) | 2.937 | 0.064 | (s) | 0 | 0 | 3.005 | 61.103 |
| 1979 | 17.539 | 20.076 | 18.104 | 2.286 | 58.005 | 2.776 | (5) | 2.931 | 0.084 | 0.005 | 0 | 0 | 3.020 | 63.801 |
| 1980 | 18.597 | 19.908 | 18.249 | 2.254 | 59.007 | 2.739 | (5) | 2.900 | 0.110 | 0.005 | 0 | 0 | 3.014 | 64.761 |
| 1981 | 18.376 | 19.699 | 18.146 | 2.307 | 58.529 | 3.008 | (5) | 2.758 | 0.123 | (s) | 0 | 0 | 2.885 | 64.421 |
| 1982 | 18.639 | 18.319 | 18.309 | 2.191 | 57.458 | 3.131 | (5) | 3.266 | 0.105 | (s) | 0 | 0 | 3.374 | 63.962 |
| 1983 | 17.246 | 16.593 | 18.392 | 2.184 | 54.416 | 3.203 | (5) | 3.527 | 0.129 | (s) | 0 | (s) | 3.661 | 61.279 |
| 1984 | 19.719 | 18.008 | 18.848 | 2.274 | 58.849 | 3.553 | (5) | 3.386 | 0.165 | 0.009 | 0 | (s) | 3.560 | 65.962 |
| 1985 | 19.325 | 16.980 | 18.992 | 2.241 | 57.539 | 4.149 | (5) | 2.970 | 0.198 | 0.014 | 0 | (s) | 3.183 | 64.871 |
| 1986 | 19.510 | 16.541 | 18.376 | 2.149 | 56.576 | 4.471 | (5) | 3.071 | 0.219 | 0.012 | 0 | (s) | 3.303 | 64.350 |
| 1987 | 20.142 | 17.136 | 17.675 | 2.215 | 57.167 | 4.906 | (5) | 2.635 | 0.229 | 0.015 | 0 | (s) | 2.879 | 64.952 |
| 1988 | 20.737 | 17.599 | 17.279 | 2.260 | 57.874 | 5.661 | (5) | 2.334 | 0.217 | 0.017 | 0 | (s) | 2.569 | 66.105 |
| 1989 | 21.345 | 17.847 | 16.117 | 2.158 | 57.468 | 5.677 | (5) | 2.767 | 0.197 | 0.020 | 0 | (s) | 2.985 | 66.129 |
| 1990 | 22.456 | 18.362 | 15.571 | 2.175 | 58.564 | 6.161 | -0.036 | R,6 3.011 | R,7 0.327 | 7 2.632 | 7 0.067 | R,7 0.024 | R,7 6.062 | R,7 70.750 |
| 1991 | 21.594 | 18.229 | 15.701 | 2.306 | 57.829 | 6.579 | -0.047 | 2.982 | R 0.332 | 2.642 | 0.068 | 0.027 | R 6.051 | R 70.412 |
| 1992 | 21.593 | 18.375 | 15.223 | 2.363 | 57.554 | 6.607 | -0.043 | 2.608 | R 0.348 | R 2.788 | 0.068 | 0.030 | R 5.842 | R 69.960 |
| 1993 | 20.221 | R 18.584 | 14.494 | 2.408 | R 55.708 | 6.519 | -0.041 | 2.884 | R 0.362 | R 2.784 | 0.069 | 0.031 | R 6.131 | 68.316 |
| 1994 | R 22.068 | R 19.272 | R 14.103 | 2.391 | R 57.833 | R 6.837 | R -0.035 | 2.674 | R 0.357 | R 2.852 | 0.068 | 0.036 | R 5.988 | R 70.624 |
| 1995 P | 21.910 | 19.230 | 13.824 | 2.441 | 57.405 | 7.189 | -0.027 | 3.197 | 0.343 | 2.941 | 0.074 | 0.041 | 6.597 | 71.163 |

[1] Includes lease condensate.
[2] See Note 1 at end of section.
[3] Represents total pumped storage facility production minus energy used for pumping.
[4] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[5] Through 1989, pumped storage is included in conventional hydroelectric power.
[6] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.
[7] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

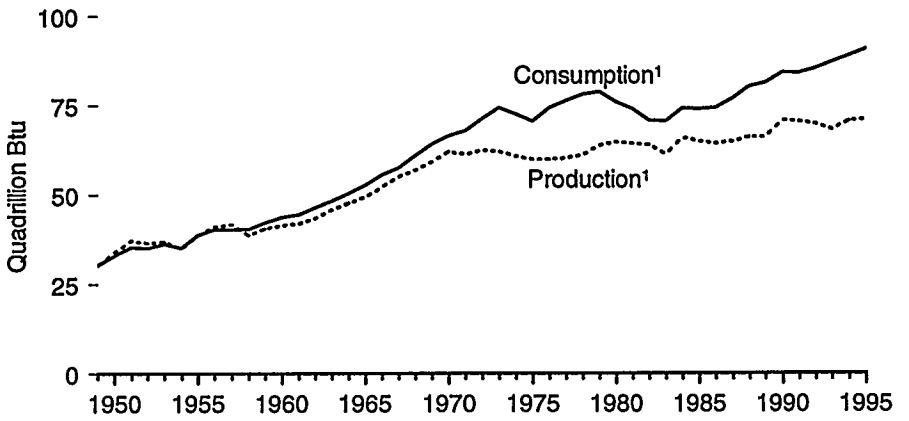
R=Revised data. P=Preliminary data. (s)=Less than 0.005 quadrillion Btu.

Note: • Totals may not equal sum of components due to independent rounding.

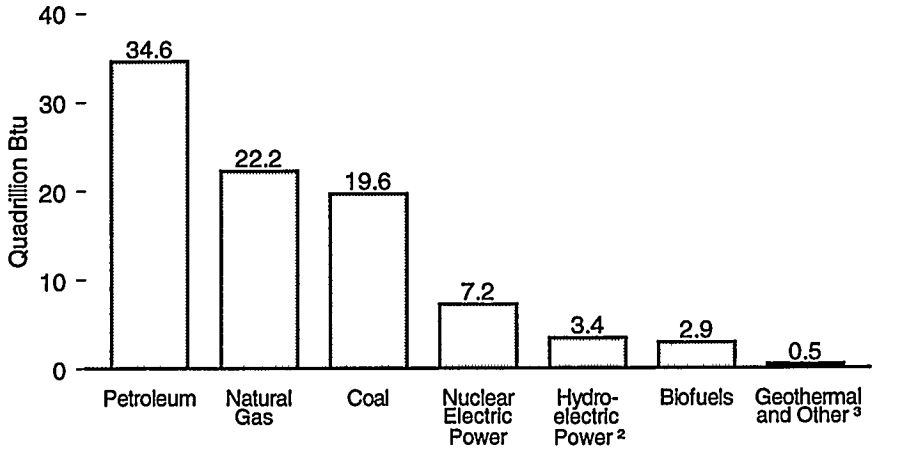
Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.4, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

## Figure 1.3 Energy Consumption by Source

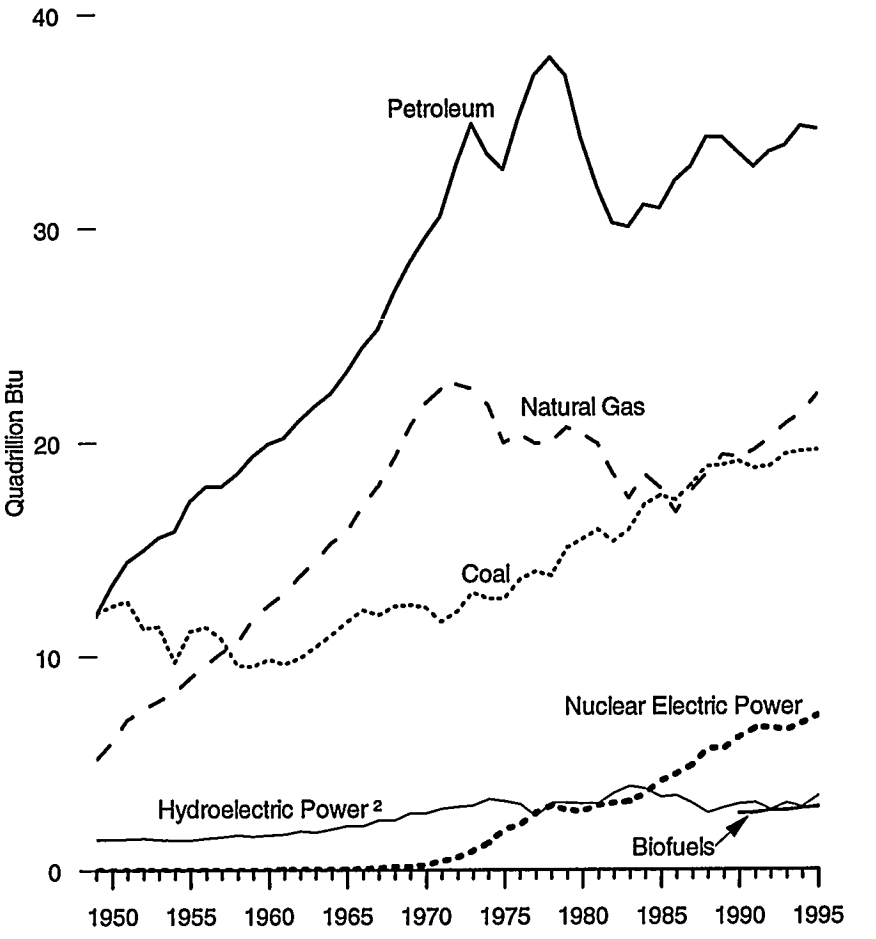
**Production and Consumption, 1949-1995**




**By Source, 1995**




**By Major Source, 1949-1995**




[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

[2] Conventional and pumped-storage hydroelectric power.

[3] "Other" is solar energy and wind energy.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 1.2 and 1.3.

# Table 1.3 Energy Consumption by Source, 1949-1995

(Quadrillion Btu)

| Year | Fossil Fuels | | | | | Nuclear Electric Power | Hydroelectric Pumped Storage [3] | Renewable Energy | | | | | | Total [7] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal | Coal Coke Net Imports | Natural Gas [1] | Petroleum [2] | Total Fossil Fuels | | | Conventional Hydroelectric Power [4] | Geothermal Energy [5] | Biofuels [6] | Solar Energy | Wind Energy | Total Renewable Energy | |
| 1949 | 11.981 | -0.007 | 5.145 | 11.883 | 29.002 | 0 | (8) | 1.449 | 0 | 0.006 | 0 | 0 | 1.454 | 30.457 |
| 1950 | 12.347 | (s) | 5.968 | 13.315 | 31.632 | 0 | (8) | 1.440 | 0 | 0.005 | 0 | 0 | 1.446 | 33.078 |
| 1951 | 12.553 | -0.021 | 7.049 | 14.428 | 34.008 | 0 | (8) | 1.454 | 0 | 0.005 | 0 | 0 | 1.459 | 35.467 |
| 1952 | 11.306 | -0.012 | 7.550 | 14.956 | 33.800 | 0 | (8) | 1.496 | 0 | 0.006 | 0 | 0 | 1.503 | 35.302 |
| 1953 | 11.373 | -0.009 | 7.907 | 15.556 | 34.826 | 0 | (8) | 1.439 | 0 | 0.005 | 0 | 0 | 1.444 | 36.270 |
| 1954 | 9.715 | -0.007 | 8.330 | 15.839 | 33.877 | 0 | (8) | 1.388 | 0 | (s) | 0 | 0 | 1.391 | 35.269 |
| 1955 | 11.167 | -0.010 | 8.998 | 17.255 | 37.410 | 0 | (8) | 1.407 | 0 | (s) | 0 | 0 | 1.411 | 38.821 |
| 1956 | 11.350 | -0.013 | 9.614 | 17.937 | 38.888 | 0 | (8) | 1.487 | 0 | (s) | 0 | 0 | 1.489 | 40.377 |
| 1957 | 10.821 | -0.017 | 10.191 | 17.932 | 38.926 | (s) | (8) | 1.557 | 0 | (s) | 0 | 0 | 1.559 | 40.484 |
| 1958 | 9.533 | -0.007 | 10.663 | 18.527 | 38.717 | (s) | (8) | 1.629 | 0 | (s) | 0 | 0 | 1.631 | 40.349 |
| 1959 | 9.518 | -0.008 | 11.717 | 19.323 | 40.550 | (s) | (8) | 1.587 | 0 | (s) | 0 | 0 | 1.589 | 42.141 |
| 1960 | 9.838 | -0.006 | 12.385 | 19.919 | 42.137 | 0.006 | (8) | 1.657 | (s) | (s) | 0 | 0 | 1.659 | 43.802 |
| 1961 | 9.623 | -0.008 | 12.926 | 20.216 | 42.758 | 0.020 | (8) | 1.680 | (s) | (s) | 0 | 0 | 1.684 | 44.462 |
| 1962 | 9.906 | -0.006 | 13.731 | 21.049 | 44.681 | 0.026 | (8) | 1.822 | (s) | (s) | 0 | 0 | 1.825 | 46.533 |
| 1963 | 10.413 | -0.007 | 14.403 | 21.701 | 46.509 | 0.038 | (8) | 1.772 | (s) | (s) | 0 | 0 | 1.777 | 48.325 |
| 1964 | 10.965 | -0.010 | 15.288 | 22.301 | 48.543 | 0.040 | (8) | 1.907 | 0.005 | (s) | 0 | 0 | 1.913 | 50.496 |
| 1965 | 11.580 | -0.018 | 15.769 | 23.246 | 50.576 | 0.043 | (8) | 2.058 | (s) | (s) | 0 | 0 | 2.065 | 52.684 |
| 1966 | 12.143 | -0.025 | 16.995 | 24.401 | 53.514 | 0.064 | (8) | 2.073 | (s) | (s) | 0 | 0 | 2.081 | 55.659 |
| 1967 | 11.914 | -0.015 | 17.945 | 25.284 | 55.127 | 0.088 | (8) | 2.344 | 0.007 | (s) | 0 | 0 | 2.354 | 57.569 |
| 1968 | 12.330 | -0.017 | 19.210 | 26.979 | 58.502 | 0.142 | (8) | 2.342 | 0.009 | (s) | 0 | 0 | 2.355 | 60.999 |
| 1969 | 12.382 | -0.036 | 20.678 | 28.338 | 61.362 | 0.154 | (8) | 2.659 | 0.013 | (s) | 0 | 0 | 2.676 | 64.192 |
| 1970 | 12.264 | -0.058 | 21.795 | 29.521 | 63.522 | 0.239 | (8) | 2.654 | 0.011 | (s) | 0 | 0 | 2.669 | 66.431 |
| 1971 | 11.599 | -0.033 | 22.469 | 30.561 | 64.596 | 0.413 | (8) | 2.861 | 0.012 | (s) | 0 | 0 | 2.876 | 67.885 |
| 1972 | 12.077 | -0.026 | 22.698 | 32.947 | 67.696 | 0.584 | (8) | 2.944 | 0.031 | (s) | 0 | 0 | 2.979 | 71.258 |
| 1973 | 12.971 | -0.007 | 22.512 | 34.840 | 70.316 | 0.910 | (8) | 3.010 | 0.043 | (s) | 0 | 0 | 3.056 | 74.282 |
| 1974 | 12.663 | 0.056 | 21.732 | 33.455 | 67.906 | 1.272 | (8) | 3.309 | 0.053 | (s) | 0 | 0 | 3.365 | 72.543 |
| 1975 | 12.663 | 0.014 | 19.948 | 32.731 | 65.355 | 1.900 | (8) | 3.219 | 0.070 | (s) | 0 | 0 | 3.291 | 70.546 |
| 1976 | 13.584 | (s) | 20.345 | 35.175 | 69.104 | 2.111 | (8) | 3.066 | 0.078 | (s) | 0 | 0 | 3.146 | 74.362 |
| 1977 | 13.922 | 0.015 | 19.931 | 37.122 | 70.989 | 2.702 | (8) | 2.515 | 0.077 | 0.005 | 0 | 0 | 2.597 | 76.288 |
| 1978 | 13.765 | 0.125 | 20.000 | 37.965 | 71.856 | 3.024 | (8) | 3.141 | 0.064 | (s) | 0 | 0 | 3.209 | 78.089 |
| 1979 | 15.039 | 0.063 | 20.666 | 37.123 | 72.892 | 2.776 | (8) | 3.141 | 0.084 | 0.005 | 0 | 0 | 3.230 | 78.898 |
| 1980 | 15.423 | -0.035 | 20.394 | 34.202 | 69.984 | 2.739 | (8) | 3.118 | 0.110 | 0.005 | 0 | 0 | 3.232 | 75.955 |
| 1981 | 15.907 | -0.016 | 19.928 | 31.931 | 67.750 | 3.008 | (8) | 3.105 | 0.123 | (s) | 0 | 0 | 3.232 | 73.990 |
| 1982 | 15.322 | -0.022 | 18.505 | 30.232 | 64.037 | 3.131 | (8) | 3.572 | 0.105 | (s) | 0 | 0 | 3.680 | 70.848 |
| 1983 | 15.894 | -0.016 | 17.357 | 30.054 | 63.290 | 3.203 | (8) | 3.899 | 0.129 | (s) | 0 | (s) | 4.032 | 70.524 |
| 1984 | 17.071 | -0.011 | 18.507 | 31.051 | 66.617 | 3.553 | (8) | 3.800 | 0.165 | 0.009 | 0 | (s) | 3.974 | 74.144 |
| 1985 | 17.478 | -0.013 | 17.834 | 30.922 | 66.221 | 4.149 | (8) | 3.398 | 0.198 | 0.014 | 0 | (s) | 3.611 | 73.981 |
| 1986 | 17.261 | -0.017 | 16.708 | 32.196 | 66.148 | 4.471 | (8) | 3.446 | 0.219 | 0.012 | 0 | (s) | 3.678 | 74.297 |
| 1987 | 18.008 | 0.009 | 17.744 | 32.865 | 68.626 | 4.906 | (8) | 3.117 | 0.229 | 0.015 | 0 | (s) | 3.362 | 76.894 |
| 1988 | 18.846 | 0.040 | 18.552 | 34.222 | 71.660 | 5.661 | (8) | 2.662 | 0.217 | 0.017 | 0 | (s) | 2.897 | 80.218 |
| 1989 | 18.925 | 0.030 | 19.384 | 34.211 | 72.551 | 5.677 | (8) | 2.881 | 0.197 | 0.020 | 0 | (s) | 3.098 | 81.325 |
| 1990 | 19.101 | 0.005 | 19.296 | 33.553 | 71.955 | 6.161 | -0.036 | R,9 3.102 | R,10 0.338 | 9 2.632 | 9 0.067 | R,10 0.024 | R,10 6.163 | R,10 84.167 |
| 1991 | 18.770 | 0.009 | 19.606 | 32.845 | 71.231 | 6.579 | -0.047 | R 3.181 | R 0.347 | 2.642 | 0.068 | 0.027 | R 6.265 | R 84.052 |
| 1992 | 18.868 | 0.027 | 20.131 | 33.527 | 72.553 | 6.607 | -0.043 | R 2.852 | R 0.367 | R 2.788 | 0.068 | 0.030 | R 6.106 | R 85.261 |
| 1993 | 19.430 | 0.017 | R 20.827 | 33.841 | R 74.115 | 6.519 | -0.041 | R 3.138 | R 0.381 | R 2.784 | 0.069 | 0.031 | R 6.403 | R 87.026 |
| 1994 | 19.544 | 0.024 | R 21.337 | R 34.735 | R 75.639 | R 6.837 | R -0.035 | R 2.958 | R 0.381 | R 2.852 | 0.068 | 0.036 | R 6.296 | R 88.900 |
| 1995 P | 19.618 | 0.026 | 22.202 | 34.624 | 76.471 | 7.189 | -0.027 | 3.462 | 0.362 | 2.941 | 0.074 | 0.041 | 6.879 | 90.618 |

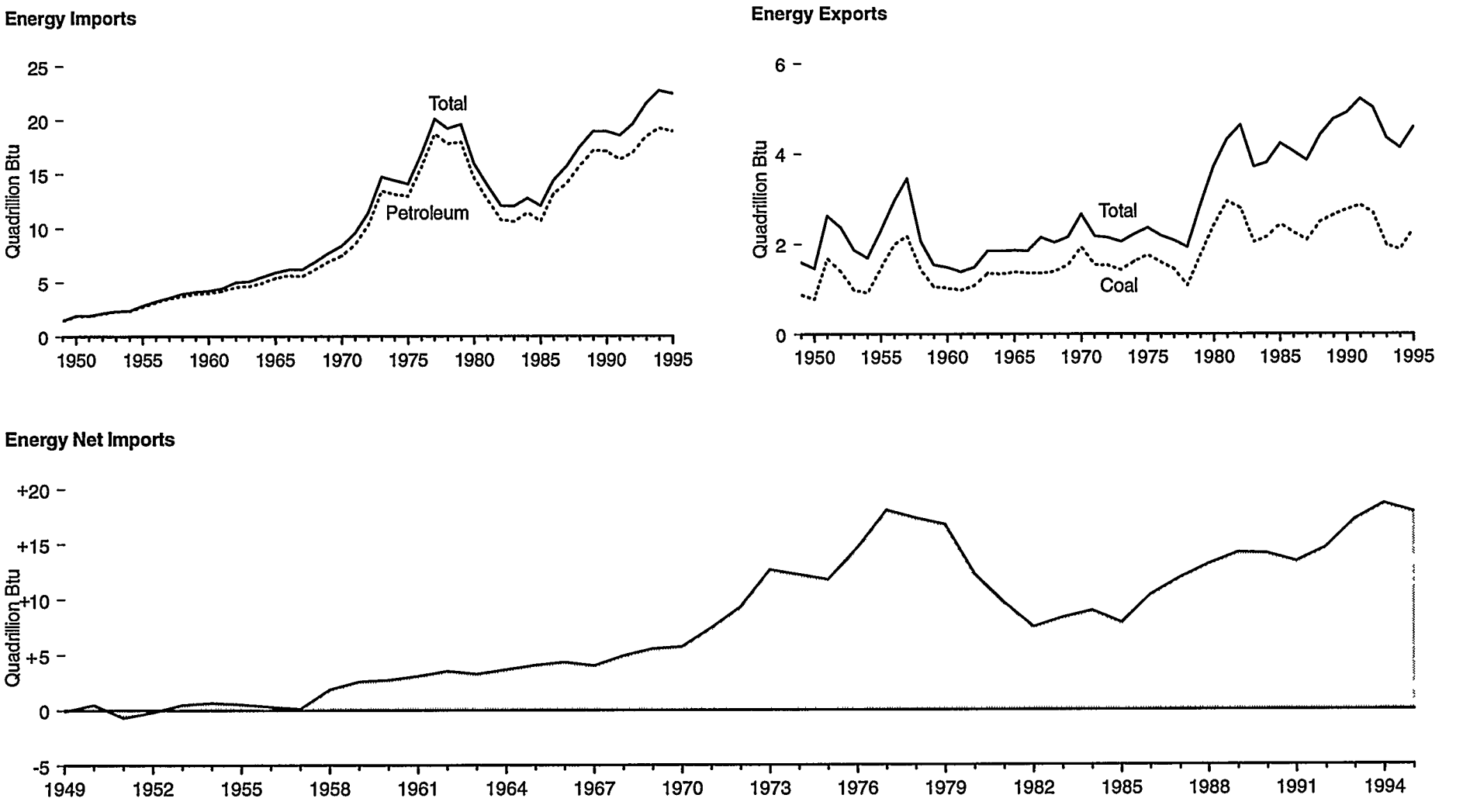
[1] Includes supplemental gaseous fuels.
[2] Petroleum products supplied, including natural gas plant liquids and crude oil burned as fuel.
[3] Represents total pumped storage facility production minus energy used for pumping.
[4] Through 1989, includes all net imports of electricity. From 1990, includes only the portion of net imports of electricity that is derived from hydroelectric power.
[5] Includes electricity imports from Mexico that are derived from geothermal energy.
[6] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oils, and/or other waste.
[7] From 1990, the portion of net imports of electricity that is derived from nonrenewable energy sources is included directly in the "Total."
[8] Through 1989, pumped storage is included in conventional hydroelectric power.
[9] There is a discontinuity in this time series between 1989 and 1990; beginning in 1990, pumped storage is removed and expanded coverage of industrial use of hydroelectric power is included.

R=Revised data. P=Preliminary data. (s)=Less than 0.005 quadrillion Btu.

Note: • Totals may not equal sum of components due to independent rounding.

Sources: Tables 5.1, 6.1, 7.1, 7.7, 8.1, 8.3, 10.1a, Energy Information Administration estimates for industrial hydroelectric power, and conversion factors in Appendix A.

## Figure 1.4 Energy Imports, Exports, and Net Imports, 1949-1995




Notes: • Negative net imports are net exports. • Because vertical scales differ, graphs should not be compared.

Source: Table 1.4.

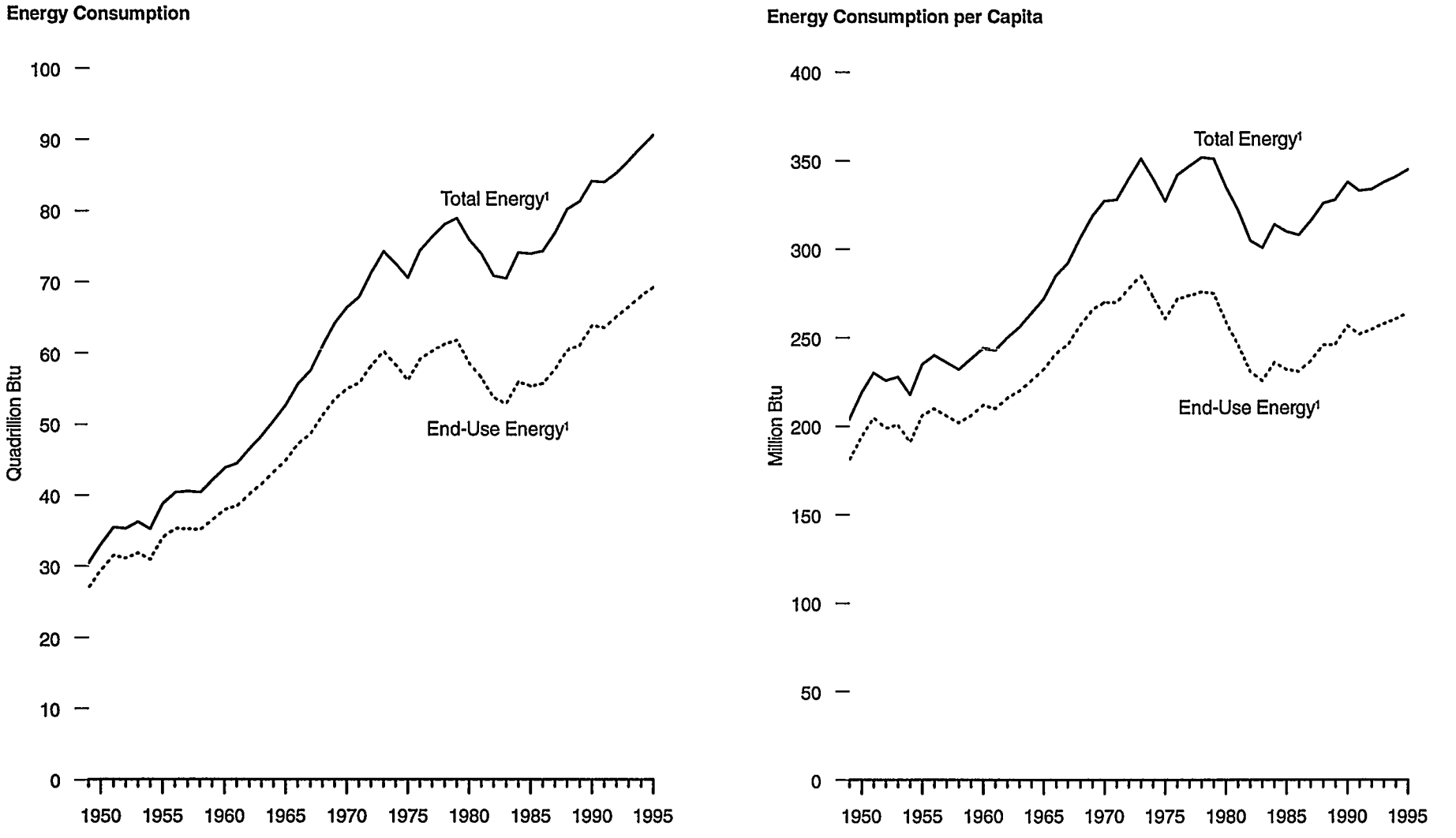
# Table 1.4 Energy Imports, Exports, and Net Imports, 1949-1995
(Quadrillion Btu)

| | Imports | | | | | Exports | | | | | Net Imports [1] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Coal | Natural Gas (Dry) | Petroleum [2] | Other [3] | Total | Coal | Natural Gas (Dry) | Petroleum | Other [3] | Total | Coal | Natural Gas (Dry) | Petroleum [2] | Other [3] | Total |
| 1949 | 0.01 | 0.00 | 1.43 | 0.03 | 1.47 | 0.88 | 0.02 | 0.68 | 0.02 | 1.59 | -0.87 | -0.02 | 0.75 | 0.02 | -0.13 |
| 1950 | 0.01 | 0.00 | 1.89 | 0.04 | 1.93 | 0.79 | 0.03 | 0.64 | 0.01 | 1.47 | -0.78 | -0.03 | 1.24 | 0.03 | 0.47 |
| 1951 | 0.01 | 0.00 | 1.87 | 0.04 | 1.92 | 1.68 | 0.03 | 0.89 | 0.03 | 2.62 | -1.67 | -0.03 | 0.98 | 0.01 | -0.71 |
| 1952 | 0.01 | 0.01 | 2.11 | 0.04 | 2.17 | 1.40 | 0.03 | 0.91 | 0.02 | 2.37 | -1.40 | -0.02 | 1.20 | 0.02 | -0.20 |
| 1953 | 0.01 | 0.01 | 2.28 | 0.04 | 2.34 | 0.98 | 0.03 | 0.84 | 0.02 | 1.87 | -0.97 | -0.02 | 1.44 | 0.02 | 0.47 |
| 1954 | 0.01 | 0.01 | 2.32 | 0.04 | 2.37 | 0.91 | 0.03 | 0.75 | 0.01 | 1.70 | -0.91 | -0.02 | 1.58 | 0.02 | 0.67 |
| 1955 | 0.01 | 0.01 | 2.75 | 0.06 | 2.83 | 1.46 | 0.03 | 0.77 | 0.02 | 2.29 | -1.46 | -0.02 | 1.98 | 0.04 | 0.54 |
| 1956 | 0.01 | 0.01 | 3.17 | 0.06 | 3.25 | 1.98 | 0.04 | 0.91 | 0.02 | 2.95 | -1.98 | -0.03 | 2.26 | 0.04 | 0.30 |
| 1957 | 0.01 | 0.04 | 3.46 | 0.06 | 3.57 | 2.17 | 0.04 | 1.20 | 0.03 | 3.45 | -2.16 | (s) | 2.26 | 0.02 | 0.12 |
| 1958 | 0.01 | 0.14 | 3.72 | 0.05 | 3.92 | 1.42 | 0.04 | 0.58 | 0.02 | 2.06 | -1.41 | 0.10 | 3.14 | 0.03 | 1.86 |
| 1959 | 0.01 | 0.14 | 3.91 | 0.05 | 4.11 | 1.05 | 0.02 | 0.45 | 0.02 | 1.54 | -1.04 | 0.12 | 3.46 | 0.03 | 2.57 |
| 1960 | 0.01 | 0.16 | 4.00 | 0.06 | 4.23 | 1.02 | 0.01 | 0.43 | 0.02 | 1.48 | -1.02 | 0.15 | 3.57 | 0.04 | 2.74 |
| 1961 | (s) | 0.23 | 4.19 | 0.04 | 4.46 | 0.98 | 0.01 | 0.37 | 0.02 | 1.38 | -0.98 | 0.22 | 3.82 | 0.02 | 3.08 |
| 1962 | 0.01 | 0.42 | 4.56 | 0.03 | 5.01 | 1.08 | 0.02 | 0.36 | 0.03 | 1.48 | -1.08 | 0.40 | 4.20 | (s) | 3.53 |
| 1963 | 0.01 | 0.42 | 4.65 | 0.03 | 5.10 | 1.36 | 0.02 | 0.44 | 0.03 | 1.85 | -1.35 | 0.40 | 4.21 | -0.01 | 3.25 |
| 1964 | 0.01 | 0.46 | 4.96 | 0.07 | 5.49 | 1.34 | 0.02 | 0.43 | 0.06 | 1.84 | -1.33 | 0.44 | 4.53 | 0.01 | 3.65 |
| 1965 | (s) | 0.47 | 5.40 | 0.04 | 5.92 | 1.38 | 0.03 | 0.39 | 0.06 | 1.85 | -1.37 | 0.44 | 5.01 | -0.02 | 4.06 |
| 1966 | (s) | 0.50 | 5.63 | 0.05 | 6.18 | 1.35 | 0.03 | 0.41 | 0.06 | 1.85 | -1.35 | 0.47 | 5.21 | -0.01 | 4.32 |
| 1967 | 0.01 | 0.58 | 5.56 | 0.04 | 6.19 | 1.35 | 0.08 | 0.65 | 0.06 | 2.15 | -1.35 | 0.50 | 4.91 | -0.02 | 4.04 |
| 1968 | 0.01 | 0.67 | 6.21 | 0.04 | 6.93 | 1.38 | 0.10 | 0.49 | 0.06 | 2.03 | -1.37 | 0.58 | 5.73 | -0.02 | 4.90 |
| 1969 | (s) | 0.75 | 6.90 | 0.06 | 7.71 | 1.53 | 0.05 | 0.49 | 0.08 | 2.15 | -1.53 | 0.70 | 6.42 | -0.02 | 5.56 |
| 1970 | (s) | 0.85 | 7.47 | 0.07 | 8.39 | 1.94 | 0.07 | 0.55 | 0.11 | 2.66 | -1.93 | 0.77 | 6.92 | -0.04 | 5.72 |
| 1971 | (s) | 0.96 | 8.54 | 0.08 | 9.58 | 1.55 | 0.08 | 0.47 | 0.07 | 2.18 | -1.54 | 0.88 | 8.07 | (s) | 7.41 |
| 1972 | (s) | 1.05 | 10.30 | 0.11 | 11.46 | 1.53 | 0.08 | 0.47 | 0.06 | 2.14 | -1.53 | 0.97 | 9.83 | 0.05 | 9.32 |
| 1973 | (s) | 1.06 | 13.47 | 0.20 | 14.73 | 1.43 | 0.08 | 0.49 | 0.06 | 2.05 | -1.42 | 0.98 | 12.98 | 0.14 | 12.68 |
| 1974 | 0.05 | 0.99 | 13.13 | 0.25 | 14.41 | 1.62 | 0.08 | 0.46 | 0.06 | 2.22 | -1.57 | 0.91 | 12.66 | 0.19 | 12.19 |
| 1975 | 0.02 | 0.98 | 12.95 | 0.16 | 14.11 | 1.76 | 0.07 | 0.44 | 0.08 | 2.36 | -1.74 | 0.90 | 12.51 | 0.08 | 11.75 |
| 1976 | 0.03 | 0.99 | 15.67 | 0.15 | 16.84 | 1.60 | 0.07 | 0.47 | 0.06 | 2.19 | -1.57 | 0.92 | 15.20 | 0.09 | 14.65 |
| 1977 | 0.04 | 1.04 | 18.76 | 0.26 | 20.09 | 1.44 | 0.06 | 0.51 | 0.06 | 2.07 | -1.40 | 0.98 | 18.24 | 0.20 | 18.02 |
| 1978 | 0.07 | 0.99 | 17.82 | 0.36 | 19.25 | 1.08 | 0.05 | 0.77 | 0.03 | 1.93 | -1.00 | 0.94 | 17.06 | 0.33 | 17.32 |
| 1979 | 0.05 | 1.30 | 17.93 | 0.33 | 19.62 | 1.75 | 0.06 | 1.00 | 0.06 | 2.87 | -1.70 | 1.24 | 16.93 | 0.27 | 16.75 |
| 1980 | 0.03 | 1.01 | 14.66 | 0.28 | 15.97 | 2.42 | 0.05 | 1.16 | 0.09 | 3.72 | -2.39 | 0.96 | 13.50 | 0.18 | 12.25 |
| 1981 | 0.03 | 0.92 | 12.64 | 0.39 | 13.97 | 2.94 | 0.06 | 1.26 | 0.06 | 4.33 | -2.92 | 0.86 | 11.38 | 0.33 | 9.65 |
| 1982 | 0.02 | 0.95 | 10.78 | 0.35 | 12.09 | 2.79 | 0.05 | 1.73 | 0.06 | 4.63 | -2.77 | 0.90 | 9.05 | 0.28 | 7.46 |
| 1983 | 0.03 | 0.94 | 10.65 | 0.41 | 12.03 | 2.04 | 0.06 | 1.57 | 0.05 | 3.72 | -2.01 | 0.89 | 9.08 | 0.36 | 8.31 |
| 1984 | 0.03 | 0.85 | 11.43 | 0.46 | 12.77 | 2.15 | 0.06 | 1.54 | 0.05 | 3.80 | -2.12 | 0.79 | 9.89 | 0.40 | 8.96 |
| 1985 | 0.05 | 0.95 | 10.61 | 0.49 | 12.10 | 2.44 | 0.06 | 1.66 | 0.08 | 4.23 | -2.39 | 0.90 | 8.95 | 0.41 | 7.87 |
| 1986 | 0.06 | 0.75 | 13.20 | 0.43 | 14.44 | 2.25 | 0.06 | 1.67 | 0.08 | 4.06 | -2.19 | 0.69 | 11.53 | 0.36 | 10.38 |
| 1987 | 0.04 | 0.99 | 14.16 | 0.57 | 15.76 | 2.09 | 0.05 | 1.63 | 0.08 | 3.85 | -2.05 | 0.94 | 12.53 | 0.49 | 11.91 |
| 1988 | 0.05 | 1.30 | 15.75 | 0.47 | 17.56 | 2.50 | 0.07 | 1.74 | 0.10 | 4.42 | -2.45 | 1.22 | 14.01 | 0.37 | 13.15 |
| 1989 | 0.07 | 1.39 | 17.16 | 0.33 | 18.95 | 2.64 | 0.11 | 1.84 | 0.18 | 4.77 | -2.57 | 1.28 | 15.33 | 0.14 | 14.18 |
| 1990 | 0.07 | 1.55 | 17.12 | R0.26 | 18.99 | 2.77 | 0.09 | 1.82 | 0.23 | 4.91 | -2.70 | 1.46 | 15.29 | 0.03 | 14.08 |
| 1991 | 0.08 | 1.80 | 16.35 | 0.35 | 18.58 | 2.85 | 0.13 | 2.13 | 0.11 | 5.22 | -2.77 | 1.67 | 14.22 | R0.25 | 13.36 |
| 1992 | 0.10 | 2.16 | 16.97 | R0.44 | R19.66 | 2.68 | 0.22 | 2.01 | 0.11 | 5.02 | -2.59 | 1.94 | 14.96 | R0.33 | R14.64 |
| 1993 | 0.18 | 2.40 | 18.51 | R0.45 | R21.54 | 1.96 | 0.14 | 2.12 | 0.13 | 4.35 | -1.78 | 2.25 | 16.40 | R0.32 | R17.19 |
| 1994 | 0.19 | R2.68 | R19.25 | R0.59 | R22.71 | 1.88 | R0.16 | 1.99 | R0.09 | R4.12 | -1.69 | R2.52 | R17.26 | R0.49 | R18.58 |
| 1995P | 0.18 | 2.80 | 18.94 | 0.52 | 22.44 | 2.32 | 0.16 | 1.99 | 0.10 | 4.58 | -2.14 | 2.63 | 16.95 | 0.42 | 17.86 |

[1] Net Imports = Imports minus exports.
[2] Includes imports into the Strategic Petroleum Reserve, which began in 1977.
[3] Coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico.
R=Revised data. P=Preliminary data. (s)=Less than 0.005 quadrillion Btu.

Notes: • Includes trade between the United States (50 States and the District of Columbia) and its territories and possessions. • Totals or net import items may not equal sum of components due to independent rounding.
Sources: Tables 5.1, 5.5, 6.1, 7.1, 7.7, and 8.1, and conversion factors in Appendix A.

## Figure 1.5 Energy Consumption and Energy Consumption per Capita, 1949-1995




¹ There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

Source: Table 1.5.

# Table 1.5 Energy Consumption and Energy Consumption per Capita, 1949-1995

| Year | Total Energy Consumption (quadrillion Btu) | End-Use Energy Consumption [1] (quadrillion Btu) | Population [2] (million) | Consumption per Capita | | | |
|---|---|---|---|---|---|---|---|
| | | | | Total Energy | | End-Use Energy [1] | |
| | | | | Quantity (million Btu) | Change from Previous Year (percent) [3] | Quantity (million Btu) | Change from Previous Year (percent) [3] |
| 1949 | 30.46 | 26.97 | 149.3 | 204 | — | 181 | — |
| 1950 | 33.08 | 29.37 | 151.3 | 219 | 7.4 | 194 | 7.2 |
| 1951 | 35.47 | 31.50 | 154.0 | 230 | 5.0 | 205 | 5.7 |
| 1952 | 35.30 | 31.16 | 156.4 | 226 | -1.7 | 199 | -2.9 |
| 1953 | 36.27 | 31.87 | 159.0 | 228 | 0.9 | 201 | 1.0 |
| 1954 | 35.27 | 30.92 | 161.9 | 218 | -4.4 | 191 | -5.0 |
| 1955 | 38.82 | 34.02 | 165.1 | 235 | 7.8 | 206 | 7.9 |
| 1956 | 40.38 | 35.26 | 168.1 | 240 | 2.1 | 210 | 1.9 |
| 1957 | 40.48 | 35.19 | 171.2 | 236 | -1.7 | 206 | -1.9 |
| 1958 | 40.35 | 35.13 | 174.1 | 232 | -1.7 | 202 | -1.9 |
| 1959 | 42.14 | 36.53 | 177.1 | 238 | 2.6 | 206 | 2.0 |
| 1960 | 43.80 | 37.96 | 179.3 | 244 | 2.5 | 212 | 2.9 |
| 1961 | 44.46 | 38.46 | 183.0 | 243 | -0.4 | 210 | -0.9 |
| 1962 | 46.53 | 40.15 | 185.8 | 250 | 2.9 | 216 | 2.9 |
| 1963 | 48.32 | 41.54 | 188.5 | 256 | 2.4 | 220 | 1.9 |
| 1964 | 50.50 | 43.22 | 191.1 | 264 | 3.1 | 226 | 2.7 |
| 1965 | 52.68 | 44.93 | 193.5 | 272 | 3.0 | 232 | 2.7 |
| 1966 | 55.66 | 47.20 | 195.6 | 285 | 4.8 | 241 | 3.9 |
| 1967 | 57.57 | 48.62 | 197.5 | 292 | 2.5 | 246 | 2.1 |
| 1968 | 61.00 | 51.22 | 199.4 | 306 | 4.8 | 257 | 4.5 |
| 1969 | 64.19 | 53.49 | 201.4 | 319 | 4.2 | 266 | 3.5 |
| 1970 | 66.43 | 54.91 | 203.2 | 327 | 2.5 | 270 | 1.5 |
| 1971 | 67.89 | 55.75 | 206.8 | 328 | 0.3 | 270 | 0.0 |
| 1972 | 71.26 | 58.18 | 209.3 | 340 | 3.7 | 278 | 3.0 |
| 1973 | 74.28 | 60.27 | 211.4 | 351 | 3.2 | 285 | 2.5 |
| 1974 | 72.54 | 58.34 | 213.3 | 340 | -3.1 | 273 | -4.2 |
| 1975 | 70.55 | 56.16 | 215.5 | 327 | -3.8 | 261 | -4.4 |
| 1976 | 74.36 | 59.12 | 217.6 | 342 | 4.6 | 272 | 4.2 |
| 1977 | 76.29 | 60.22 | 219.8 | 347 | 1.5 | 274 | 0.7 |
| 1978 | 78.09 | 61.25 | 222.1 | 352 | 1.4 | 276 | 0.7 |
| 1979 | 78.90 | 61.84 | 224.6 | 351 | -0.3 | 275 | -0.4 |
| 1980 | 75.96 | 58.60 | 226.5 | 335 | -4.6 | 259 | -5.8 |
| 1981 | 73.99 | 56.56 | 229.6 | 322 | -3.9 | 246 | -5.0 |
| 1982 | 70.85 | 53.70 | 232.0 | 305 | -5.3 | 231 | -6.1 |
| 1983 | 70.52 | 52.91 | 234.3 | 301 | -1.3 | 226 | -2.2 |
| 1984 | 74.14 | 55.92 | 236.5 | 314 | 4.3 | 236 | 4.4 |
| 1985 | 73.98 | 55.39 | 238.7 | 310 | -1.3 | 232 | -1.7 |
| 1986 | 74.30 | 55.68 | 241.1 | 308 | -0.6 | 231 | -0.4 |
| 1987 | 76.89 | 57.68 | 243.4 | 316 | 2.6 | 237 | 2.6 |
| 1988 | 80.22 | 60.37 | 245.8 | 326 | 3.2 | 246 | 3.8 |
| 1989 | 81.33 | 61.07 | 248.2 | 328 | 0.6 | 246 | 0.0 |
| 1990 | [4]84.17 | [4]63.82 | 248.7 | [4]338 | [4]3.0 | [4]257 | [4]4.5 |
| 1991 | [R]84.05 | [R]63.56 | 252.1 | 333 | -1.5 | 252 | [R]-1.9 |
| 1992 | [R]85.26 | [R]65.14 | 255.0 | 334 | 0.3 | 255 | 1.2 |
| 1993 | [R]87.03 | [R]66.49 | 257.8 | [R]338 | [R]1.2 | [R]258 | [R]1.2 |
| 1994 | [R]88.90 | [R]68.03 | 260.3 | [R]341 | 0.9 | [R]261 | 1.2 |
| 1995[P] | 90.62 | 69.24 | 262.8 | 345 | 1.2 | 264 | 1.1 |

[1] End-use energy consumption is total energy consumption less losses incurred in the generation, transmission, and distribution of electricity, less power plant electricity use and unaccounted for electrical system energy losses. (See Glossary.)

[2] Resident population of the 50 States and the District of Columbia estimated for July 1 of each year, except for the April 1 census count in 1950, 1960, 1970, 1980, and 1990.

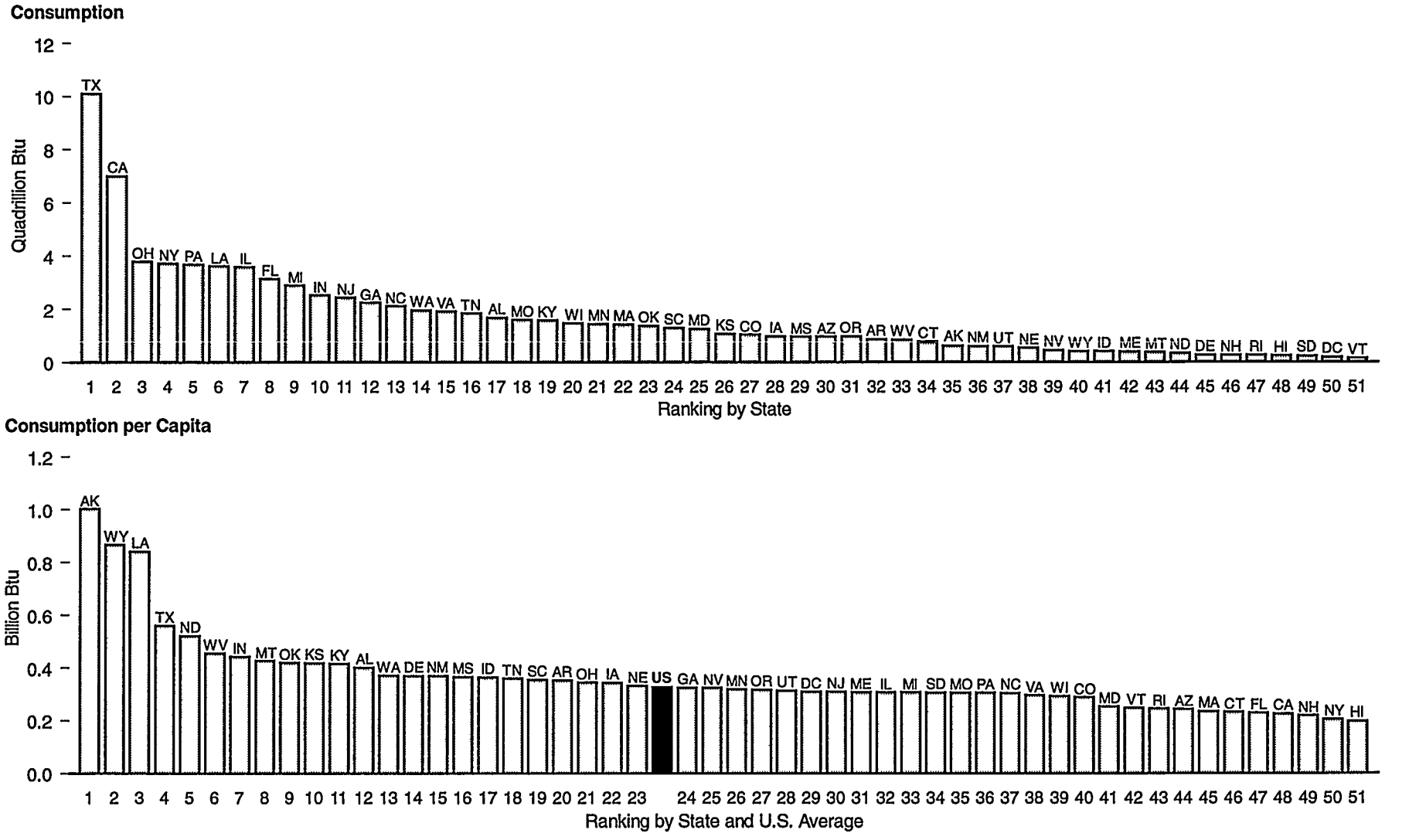
[3] Percent change calculated from data prior to rounding.

[4] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

R=Revised data. P=Preliminary data. — = Not applicable.

Sources: **Total Energy Consumption:** Table 1.3. **End-Use Energy Consumption:** Table 1.3. **Population:** • 1949—Bureau of the Census, *Current Population Reports,* "Population Estimates and Projections," Series P-25, No. 802, May 1979. • 1950-1980—Bureau of the Census, *Current Population Reports,* "Population Estimates and Projections," Series P-25, No. 990, July 1986. • 1981 forward—unpublished data consistent with the Bureau of the Census Press Release CB96-10, January 1996. **Consumption per Capita:** calculated by Energy Information Administration.

## Figure 1.6 Energy Consumption and Consumption per Capita by State, 1993




Source: Table 1.6.

# Table 1.6 Energy Consumption and Consumption per Capita by State, 1993

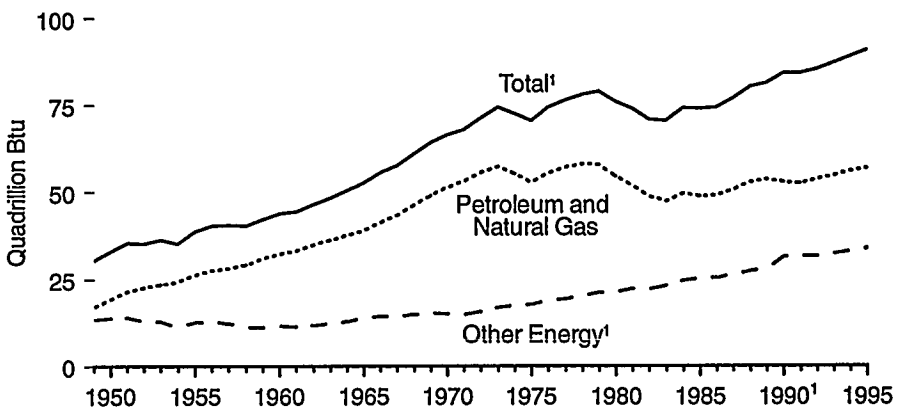
| Rank | State | Consumption (Trillion Btu) | Rank | State | Consumption per Capita (Million Btu) |
|---|---|---|---|---|---|
| 1 | Texas | 10,081.1 | 1 | Alaska | 1,001.6 |
| 2 | California | 6,988.4 | 2 | Wyoming | 864.6 |
| 3 | Ohio | 3,790.6 | 3 | Louisiana | 840.3 |
| 4 | New York | 3,701.7 | 4 | Texas | 559.4 |
| 5 | Pennsylvania | 3,665.9 | 5 | North Dakota | 519.5 |
| 6 | Louisiana | 3,604.7 | 6 | West Virginia | 454.1 |
| 7 | Illinois | 3,582.1 | 7 | Indiana | 440.6 |
| 8 | Florida | 3,128.2 | 8 | Montana | 425.6 |
| 9 | Michigan | 2,898.7 | 9 | Oklahoma | 419.1 |
| 10 | Indiana | 2,513.8 | 10 | Kansas | 417.1 |
| 11 | New Jersey | 2,421.9 | 11 | Kentucky | 415.7 |
| 12 | Georgia | 2,236.7 | 12 | Alabama | 399.3 |
| 13 | North Carolina | 2,103.6 | 13 | Washington | 369.6 |
| 14 | Washington | 1,943.6 | 14 | Delaware | 368.5 |
| 15 | Virginia | 1,911.4 | 15 | New Mexico | 368.2 |
| 16 | Tennessee | 1,832.4 | 16 | Mississippi | 364.8 |
| 17 | Alabama | 1,669.4 | 17 | Idaho | 362.9 |
| 18 | Missouri | 1,597.4 | 18 | Tennessee | 359.7 |
| 19 | Kentucky | 1,577.0 | 19 | South Carolina | 352.3 |
| 20 | Wisconsin | 1,464.7 | 20 | Arkansas | 351.7 |
| 21 | Minnesota | 1,432.2 | 21 | Ohio | 342.7 |
| 22 | Massachusetts | 1,407.9 | 22 | Iowa | 342.4 |
| 23 | Oklahoma | 1,354.9 | 23 | Nebraska | 330.2 |
| 24 | South Carolina | 1,278.8 | 24 | Georgia | 324.1 |
| 25 | Maryland | 1,245.8 | 25 | Nevada | 322.8 |
| 26 | Kansas | 1,057.3 | 26 | Minnesota | 316.6 |
| 27 | Colorado | 1,023.1 | 27 | Oregon | 315.3 |
| 28 | Iowa | 965.8 | 28 | Utah | 311.4 |
| 29 | Mississippi | 963.1 | 29 | District of Columbia | 308.3 |
| 30 | Arizona | 958.0 | 30 | New Jersey | 308.2 |
| 31 | Oregon | 957.0 | 31 | Maine | 306.7 |
| 32 | Arkansas | 853.2 | 32 | Illinois | 306.5 |
| 33 | West Virginia | 825.5 | 33 | Michigan | 306.4 |
| 34 | Connecticut | 761.6 | 34 | South Dakota | 305.8 |
| 35 | Alaska | 599.0 | 35 | Missouri | 305.1 |
| 36 | New Mexico | 594.9 | 36 | Pennsylvania | 304.7 |
| 37 | Utah | 579.1 | 37 | North Carolina | 302.6 |
| 38 | Nebraska | 532.6 | 38 | Virginia | 295.3 |
| 39 | Nevada | 446.1 | 39 | Wisconsin | 290.4 |
| 40 | Wyoming | 406.4 | 40 | Colorado | 287.1 |
| 41 | Idaho | 399.2 | 41 | Maryland | 251.3 |
| 42 | Maine | 380.3 | 42 | Vermont | 246.2 |
| 43 | Montana | 357.9 | 43 | Rhode Island | 244.9 |
| 44 | North Dakota | 330.9 | 44 | Arizona | 242.8 |
| 45 | Delaware | 257.2 | 45 | Massachusetts | 233.9 |
| 46 | New Hampshire | 245.7 | 46 | Connecticut | 232.3 |
| 47 | Rhode Island | 244.9 | 47 | Florida | 227.9 |
| 48 | Hawaii | 229.3 | 48 | California | 223.9 |
| 49 | South Dakota | 219.0 | 49 | New Hampshire | 218.6 |
| 50 | District of Columbia | 178.5 | 50 | New York | 203.9 |
| 51 | Vermont | 141.8 | 51 | Hawaii | 196.6 |
| | **United States** | [1] **83,957.8** | | **United States** | **325.7** |

[1] The U.S. energy consumption total shown here is about 3 quadrillion Btu less than that reported on Tables 1.1, 1.3, 1.5, 1.7, and 2.1; the State-level data have not yet incorporated non-electric utility use of renewable energy.

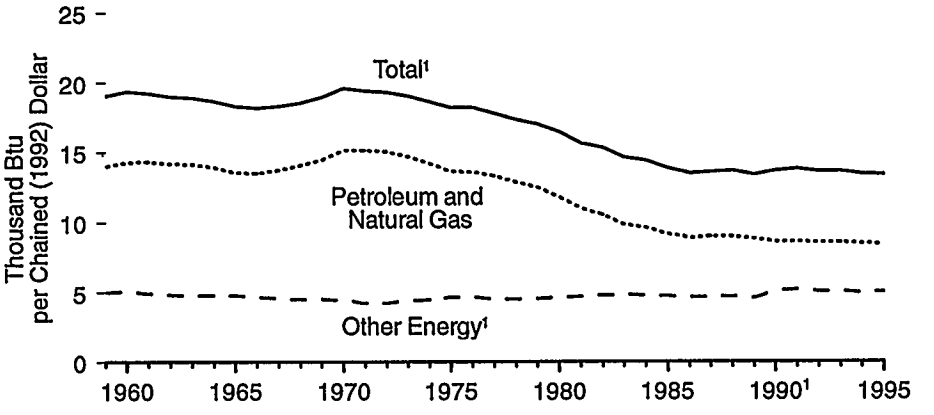
Source: Energy Information Administration, *State Energy Data Report 1993, Consumption Estimates* (July 1995).

# Figure 1.7 Energy Consumption per Dollar of Gross Domestic Product

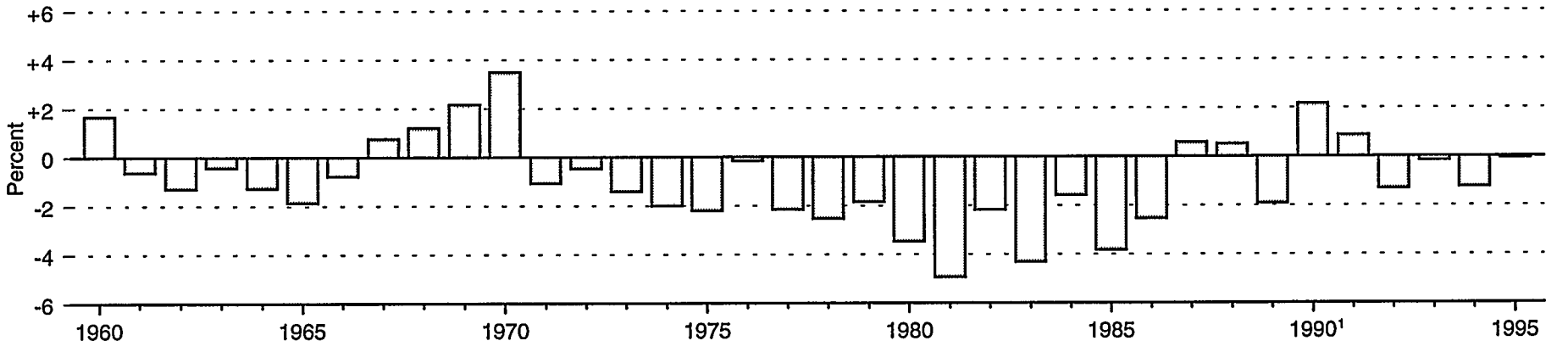
**Energy Consumption, 1949-1995**




**Energy Consumption per Dollar of Gross Domestic Product, 1959-1995**




**Total Energy Consumption per Dollar of Gross Domestic Product, Change from Previous Year, 1960-1995**




[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

Source: Table 1.7.

# Table 1.7 Energy Consumption per Dollar of Gross Domestic Product, 1949-1995

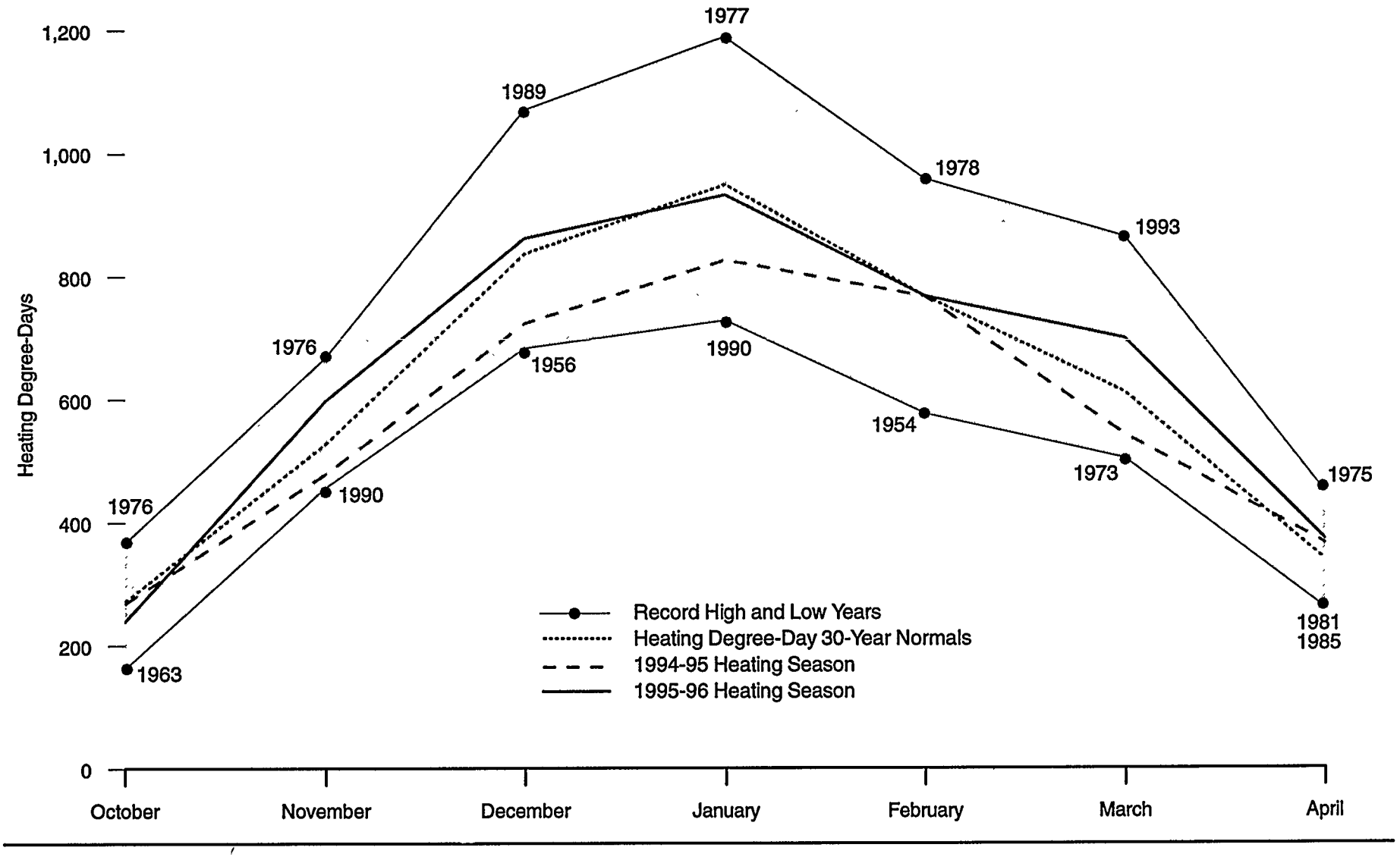
| Year | Energy Consumption | | | Gross Domestic Product (GDP)[1] | Energy Consumption per Dollar of GDP | | | |
|---|---|---|---|---|---|---|---|---|
| | Petroleum and Natural Gas | Other Energy | Total | | Petroleum and Natural Gas | Other Energy | Total | Change from Previous Year |
| | Quadrillion Btu | | | Billion Chained (1992) Dollars | Thousand Btu per Chained (1992) Dollar | | | Percent [2] |
| 1949 | 17.03 | 13.43 | 30.46 | (1) | (1) | (1) | (1) | (1) |
| 1950 | 19.28 | 13.79 | 33.08 | (1) | (1) | (1) | (1) | (1) |
| 1951 | 21.48 | 13.99 | 35.47 | (1) | (1) | (1) | (1) | (1) |
| 1952 | 22.51 | 12.80 | 35.30 | (1) | (1) | (1) | (1) | (1) |
| 1953 | 23.46 | 12.81 | 36.27 | (1) | (1) | (1) | (1) | (1) |
| 1954 | 24.17 | 11.10 | 35.27 | (1) | (1) | (1) | (1) | (1) |
| 1955 | 26.25 | 12.57 | 38.82 | (1) | (1) | (1) | (1) | (1) |
| 1956 | 27.55 | 12.83 | 40.38 | (1) | (1) | (1) | (1) | (1) |
| 1957 | 28.12 | 12.36 | 40.48 | (1) | (1) | (1) | (1) | (1) |
| 1958 | 29.19 | 11.16 | 40.35 | (1) | (1) | (1) | (1) | (1) |
| 1959 | 31.04 | 11.10 | 42.14 | R2,212.3 | R14.03 | R5.02 | R19.05 | (1) |
| 1960 | 32.30 | 11.50 | 43.80 | R2,261.7 | R14.28 | R5.08 | R19.37 | 1.7 |
| 1961 | 33.14 | 11.32 | 44.46 | R2,309.8 | R14.35 | R4.90 | R19.25 | R-0.6 |
| 1962 | 34.78 | 11.75 | 46.53 | R2,449.1 | R14.20 | R4.80 | R19.00 | R-1.3 |
| 1963 | 36.10 | 12.22 | 48.32 | R2,554.0 | R14.14 | R4.78 | R18.92 | R-0.4 |
| 1964 | 37.59 | 12.91 | 50.50 | R2,702.9 | R13.91 | R4.78 | R18.68 | R-1.3 |
| 1965 | 39.01 | 13.67 | 52.68 | R2,874.8 | R13.57 | R4.76 | R18.33 | R-1.9 |
| 1966 | 41.40 | 14.26 | 55.66 | R3,060.2 | R13.53 | R4.66 | R18.19 | R-0.8 |
| 1967 | 43.23 | 14.34 | 57.57 | R3,140.2 | R13.77 | R4.57 | R18.33 | 0.8 |
| 1968 | 46.19 | 14.81 | 61.00 | R3,288.6 | R14.05 | R4.50 | R18.55 | R1.2 |
| 1969 | 49.02 | 15.18 | 64.19 | R3,388.0 | R14.47 | R4.48 | R18.95 | R2.2 |
| 1970 | 51.32 | 15.12 | 66.43 | R3,388.2 | R15.15 | R4.46 | R19.61 | 3.5 |
| 1971 | 53.03 | 14.85 | 67.89 | R3,500.1 | R15.15 | R4.24 | R19.40 | R-1.1 |
| 1972 | 55.64 | 15.61 | 71.26 | R3,690.3 | R15.08 | R4.23 | R19.31 | R-0.5 |
| 1973 | 57.35 | 16.93 | 74.28 | R3,902.3 | R14.70 | R4.34 | R19.04 | R-1.4 |
| 1974 | 55.19 | 17.36 | 72.54 | R3,888.2 | R14.19 | R4.46 | R18.66 | R-2.0 |
| 1975 | 52.68 | 17.87 | 70.55 | R3,865.1 | R13.63 | R4.62 | R18.25 | R-2.2 |
| 1976 | 55.52 | 18.84 | 74.36 | R4,081.1 | R13.60 | R4.62 | R18.22 | R-0.2 |
| 1977 | 57.05 | 19.24 | 76.29 | R4,279.3 | R13.33 | R4.50 | R17.83 | R-2.1 |
| 1978 | 57.97 | 20.12 | 78.09 | R4,493.7 | R12.90 | R4.48 | R17.38 | R-2.5 |
| 1979 | 57.79 | 21.11 | 78.90 | R4,624.0 | R12.50 | R4.56 | R17.06 | R-1.8 |
| 1980 | 54.60 | 21.36 | 75.96 | R4,611.9 | R11.84 | R4.63 | R16.47 | R-3.5 |
| 1981 | 51.86 | 22.13 | 73.99 | R4,724.9 | R10.98 | R4.68 | R15.66 | R-4.9 |
| 1982 | 48.74 | 22.11 | 70.85 | R4,623.6 | R10.54 | R4.78 | R15.32 | R-2.2 |
| 1983 | 47.41 | 23.11 | 70.52 | R4,810.0 | R9.86 | R4.81 | R14.66 | R-4.3 |
| 1984 | 49.56 | 24.59 | 74.14 | R5,138.2 | R9.65 | R4.78 | R14.43 | R-1.6 |
| 1985 | 48.76 | 25.22 | 73.98 | R5,329.5 | R9.15 | R4.73 | R13.88 | R-3.8 |
| 1986 | 48.90 | 25.39 | 74.30 | R5,489.9 | R8.91 | R4.63 | R13.53 | R-2.5 |
| 1987 | 50.61 | 26.28 | 76.89 | R5,648.4 | R8.96 | R4.65 | R13.61 | R0.6 |
| 1988 | 52.77 | 27.44 | 80.22 | R5,862.9 | R9.00 | R4.68 | R13.68 | R0.5 |
| 1989 | 53.59 | 27.73 | 81.33 | R6,060.4 | R8.84 | R4.58 | R13.42 | R-1.9 |
| 1990 | 52.85 | R,3 31.32 | R,3 84.17 | R6,138.7 | R8.61 | R,3 5.10 | R,3 13.71 | R,3 2.2 |
| 1991 | 52.45 | R31.60 | R84.05 | R6,079.0 | R8.63 | R5.20 | R13.83 | R0.9 |
| 1992 | 53.66 | R31.60 | R85.26 | R6,244.4 | R8.59 | R5.06 | R13.65 | R-1.3 |
| 1993 | R54.67 | R32.36 | R87.03 | R6,383.8 | R8.56 | R5.07 | R13.63 | R-0.1 |
| 1994 | R56.07 | R32.83 | R88.90 | R6,604.2 | R8.49 | R4.97 | R13.46 | R-1.2 |
| 1995P | 56.83 | 33.79 | 90.62 | 6,739.0 | 8.43 | 5.01 | 13.45 | -0.1 |

[1] A comprehensive revision of the National Income and Product Accounts was released by the U. S. Department of Commerce in early 1996 that resulted in changes to the entire Gross Domestic Product series; the revised values for 1949-1958 were not available in time to include in this table.

[2] Percent change calculated from data prior to rounding.

R=Revised data. P=Preliminary data.
Note: See "Chained Dollars" in the Glossary.
Sources: Tables 1.3 and E1.

## Figure 1.8 Heating Degree-Days for Heating Season, by Month, 1949-1996




Source: Table 1.8.

# Table 1.8 Heating Degree-Days by Month, 1949-1996

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1949 | 858 | 701 | 611 | 330 | 128 | 21 | 7 | 9 | 94 | 209 | 503 | 763 | 4,234 |
| 1950 | 761 | 721 | 693 | 412 | 162 | 40 | 11 | 18 | 85 | 196 | 565 | 872 | 4,536 |
| 1951 | 863 | 724 | 632 | 359 | 135 | 45 | 8 | 17 | 74 | 231 | 645 | 814 | 4,547 |
| 1952 | 807 | 677 | 670 | 315 | 154 | 32 | 5 | 11 | 54 | 324 | 540 | 785 | 4,374 |
| 1953 | 754 | 667 | 557 | 378 | 142 | 33 | 5 | 11 | 51 | 208 | 492 | 765 | 4,063 |
| 1954 | 886 | 577 | 646 | 261 | 192 | 32 | 8 | 18 | 56 | 224 | 523 | 809 | 4,232 |
| 1955 | 927 | 759 | 600 | 272 | 121 | 48 | 9 | 6 | 56 | 237 | 600 | 886 | 4,521 |
| 1956 | 900 | 723 | 648 | 387 | 157 | 27 | 10 | 14 | 82 | 215 | 541 | 683 | 4,387 |
| 1957 | 977 | 628 | 610 | 308 | 148 | 23 | 6 | 16 | 61 | 315 | 536 | 711 | 4,339 |
| 1958 | 909 | 866 | 690 | 324 | 143 | 54 | 7 | 8 | 60 | 250 | 484 | 917 | 4,712 |
| 1959 | 944 | 762 | 619 | 305 | 112 | 26 | 4 | 6 | 48 | 249 | 594 | 734 | 4,403 |
| 1960 | 884 | 780 | 831 | 278 | 160 | 33 | 7 | 11 | 48 | 254 | 502 | 936 | 4,724 |
| 1961 | 982 | 670 | 565 | 413 | 199 | 29 | 5 | 7 | 48 | 238 | 532 | 852 | 4,540 |
| 1962 | 976 | 747 | 689 | 337 | 118 | 35 | 14 | 13 | 91 | 234 | 554 | 886 | 4,694 |
| 1963 | 1,061 | 841 | 562 | 325 | 163 | 35 | 8 | 18 | 76 | 162 | 471 | 1,012 | 4,734 |
| 1964 | 871 | 803 | 636 | 339 | 124 | 39 | 5 | 22 | 72 | 301 | 489 | 814 | 4,515 |
| 1965 | 907 | 780 | 738 | 355 | 114 | 48 | 11 | 14 | 78 | 271 | 494 | 739 | 4,549 |
| 1966 | 1,010 | 790 | 580 | 377 | 188 | 30 | 6 | 14 | 81 | 298 | 496 | 830 | 4,700 |
| 1967 | 816 | 820 | 600 | 352 | 229 | 34 | 8 | 17 | 82 | 270 | 588 | 793 | 4,609 |
| 1968 | 979 | 832 | 567 | 309 | 192 | 35 | 6 | 14 | 59 | 240 | 548 | 894 | 4,675 |
| 1969 | 939 | 778 | 735 | 307 | 134 | 47 | 7 | 9 | 60 | 296 | 564 | 860 | 4,736 |
| 1970 | 1,063 | 758 | 685 | 344 | 120 | 31 | 4 | 9 | 55 | 253 | 541 | 801 | 4,664 |
| 1971 | 976 | 760 | 681 | 375 | 194 | 29 | 10 | 12 | 47 | 187 | 553 | 723 | 4,547 |
| 1972 | 890 | 785 | 608 | 377 | 137 | 49 | 7 | 12 | 65 | 330 | 613 | 832 | 4,705 |
| 1973 | 893 | 772 | 504 | 356 | 182 | 22 | 6 | 9 | 61 | 212 | 497 | 799 | 4,313 |
| 1974 | 838 | 754 | 556 | 310 | 171 | 42 | 6 | 13 | 94 | 303 | 524 | 795 | 4,406 |
| 1975 | 821 | 742 | 686 | 449 | 117 | 37 | 5 | 13 | 100 | 235 | 462 | 805 | 4,472 |
| 1976 | 974 | 609 | 544 | 309 | 178 | 28 | 8 | 19 | 81 | 367 | 668 | 941 | 4,726 |
| 1977 | 1,188 | 751 | 529 | 270 | 119 | 38 | 6 | 13 | 59 | 295 | 493 | 844 | 4,605 |
| 1978 | 1,061 | 958 | 677 | 350 | 157 | 31 | 7 | 11 | 59 | 283 | 517 | 847 | 4,958 |
| 1979 | 1,079 | 950 | 575 | 364 | 148 | 37 | 6 | 15 | 58 | 271 | 528 | 750 | 4,781 |
| 1980 | 887 | 831 | 680 | 338 | 142 | 49 | 5 | 10 | 54 | 316 | 564 | 831 | 4,707 |
| 1981 | 984 | 689 | 620 | 260 | 165 | 25 | 6 | 11 | 76 | 327 | 504 | 845 | 4,512 |
| 1982 | 1,067 | 776 | 620 | 408 | 114 | 62 | 7 | 19 | 75 | 264 | 515 | 692 | 4,619 |
| 1983 | 874 | 706 | 588 | 421 | 189 | 35 | 6 | 5 | 53 | 251 | 509 | 990 | 4,627 |
| 1984 | 1,000 | 645 | 704 | 371 | 172 | 28 | 7 | 7 | 88 | 223 | 565 | 704 | 4,514 |
| 1985 | 1,057 | 807 | 557 | 260 | 123 | 47 | 5 | 17 | 69 | 243 | 506 | 951 | 4,642 |
| 1986 | 859 | 734 | 542 | 295 | 123 | 30 | 9 | 18 | 76 | 258 | 558 | 793 | 4,295 |
| 1987 | 920 | 714 | 573 | 309 | 107 | 20 | 8 | 13 | 61 | 345 | 491 | 773 | 4,334 |
| 1988 | 1,004 | 778 | 594 | 344 | 134 | 30 | 3 | 5 | 72 | 352 | 506 | 831 | 4,653 |
| 1989 | 789 | 832 | 603 | 344 | 163 | 32 | 5 | 14 | 73 | 259 | 542 | 1,070 | 4,726 |
| 1990 | 728 | 655 | 535 | 321 | 184 | 29 | 6 | 10 | 56 | 246 | 457 | 789 | 4,016 |
| 1991 | 921 | 639 | 564 | 287 | 98 | 30 | 6 | 7 | 69 | 242 | 586 | 751 | 4,200 |
| 1992 | 852 | 644 | 603 | 345 | 152 | 46 | 14 | 24 | 74 | 301 | 564 | 822 | 4,441 |
| 1993 | 860 | 827 | 864 | 368 | 128 | 38 | 11 | 9 | 89 | 302 | 580 | 824 | 4,900 |
| 1994 | R1,031 | R813 | R594 | R293 | R174 | R21 | R6 | R16 | R65 | R268 | R479 | R723 | R4,483 |
| 1995P | 826 | 767 | 543 | 366 | 168 | 46 | 13 | 11 | 97 | 239 | 598 | 862 | 4,536 |
| 1996P | 932 | 768 | 699 | 372 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Normals[1] | 948 | 768 | 611 | 339 | 150 | 36 | 7 | 13 | 69 | 271 | 528 | 836 | 4,576 |

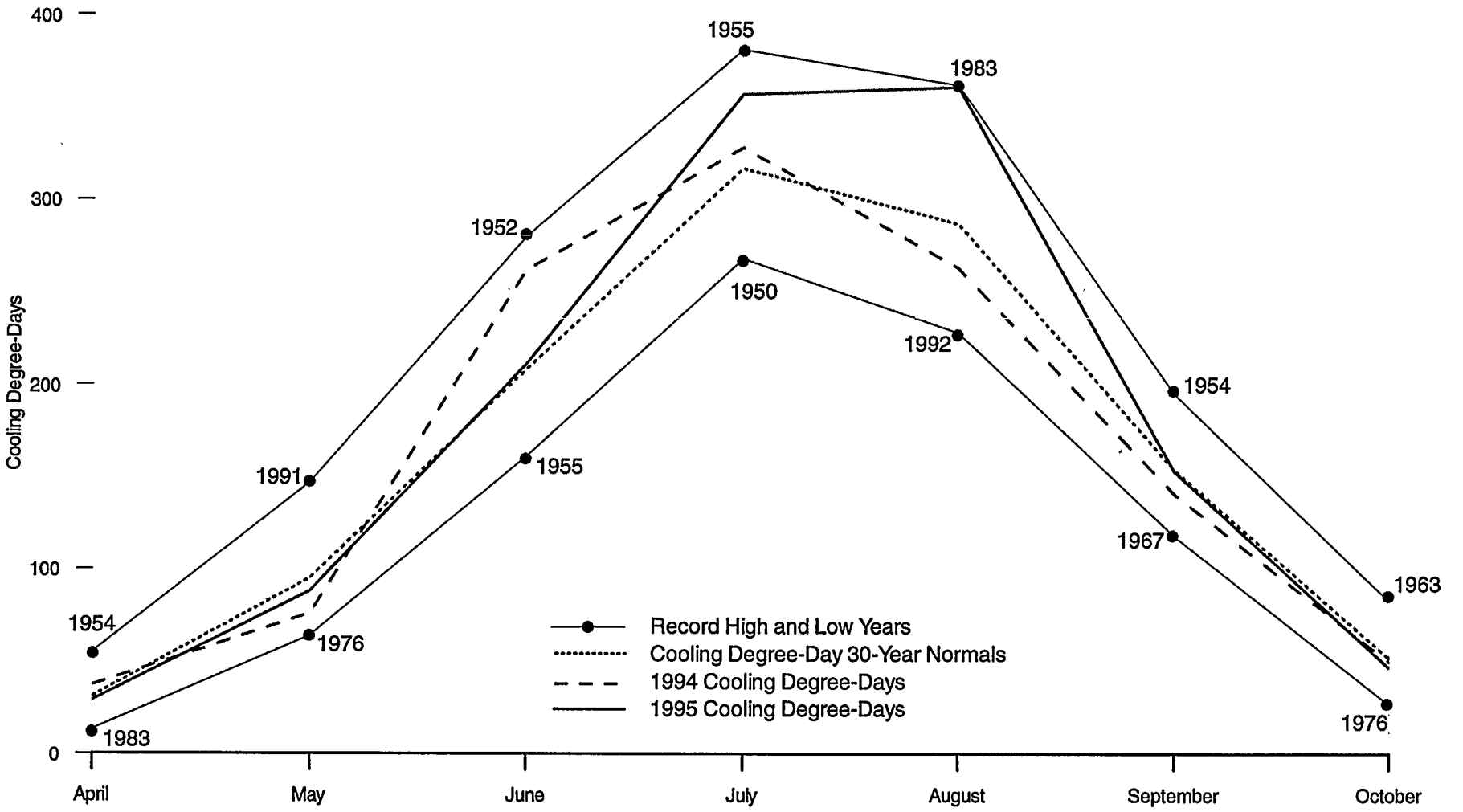
[1] Based on calculations of data from 1961 through 1990.

R=Revised data. P=Preliminary data. NA=Not available.

Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 65° F. For example, a weather station recording a mean daily temperature of 40° F would report 25 heating degree-days. • Temperature information recorded by weather stations is used to calculate statewide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average.

Sources: • 1949-1994 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1995 and 1996—Energy Information Administration, *Monthly Energy Review, (MER)* February 1995-April 1996 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. Data for April 1995 through April 1996 are preliminary and are shown as current year statistics in the May 1995 *MER* through the April 1996 *MER*. Data for January 1995 through March 1995 are final and are shown as previous year statistics in the February 1996 *MER* through the April 1996 *MER*.

## Figure 1.9 Cooling Degree-Days for Cooling Season, by Month, 1949-1995




Source: Table 1.9.

# Table 1.9 Cooling Degree-Days by Month, 1949-1996

| Year | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1949 | 16 | 14 | 14 | 27 | 110 | 253 | 367 | 294 | 131 | 70 | 12 | 10 | 1,318 |
| 1950 | 27 | 12 | 13 | 21 | 105 | 201 | 268 | 244 | 128 | 78 | 9 | 4 | 1,110 |
| 1951 | 8 | 5 | 15 | 22 | 95 | 198 | 318 | 293 | 158 | 65 | 7 | 11 | 1,195 |
| 1952 | 17 | 8 | 15 | 20 | 96 | 280 | 368 | 303 | 159 | 38 | 10 | 4 | 1,318 |
| 1953 | 12 | 8 | 26 | 25 | 118 | 263 | 338 | 292 | 168 | 58 | 11 | 7 | 1,326 |
| 1954 | 11 | 12 | 11 | 55 | 65 | 241 | 356 | 296 | 195 | 60 | 9 | 4 | 1,315 |
| 1955 | 6 | 7 | 20 | 45 | 121 | 161 | 381 | 355 | 182 | 50 | 10 | 6 | 1,344 |
| 1956 | 4 | 12 | 14 | 23 | 112 | 232 | 297 | 290 | 151 | 66 | 9 | 11 | 1,221 |
| 1957 | 12 | 17 | 13 | 33 | 96 | 243 | 337 | 275 | 155 | 30 | 13 | 6 | 1,230 |
| 1958 | 3 | 1 | 8 | 27 | 101 | 187 | 315 | 304 | 166 | 53 | 18 | 6 | 1,189 |
| 1959 | 6 | 12 | 13 | 31 | 129 | 228 | 325 | 344 | 179 | 64 | 12 | 5 | 1,348 |
| 1960 | 7 | 4 | 6 | 37 | 76 | 215 | 301 | 302 | 181 | 59 | 15 | 3 | 1,206 |
| 1961 | 5 | 9 | 23 | 20 | 71 | 195 | 306 | 287 | 186 | 47 | 12 | 7 | 1,168 |
| 1962 | 6 | 15 | 9 | 26 | 144 | 204 | 276 | 289 | 136 | 64 | 7 | 3 | 1,179 |
| 1963 | 5 | 5 | 22 | 42 | 94 | 213 | 308 | 266 | 153 | 83 | 11 | 2 | 1,204 |
| 1964 | 6 | 3 | 14 | 37 | 114 | 214 | 327 | 256 | 146 | 42 | 17 | 9 | 1,185 |
| 1965 | 9 | 7 | 10 | 42 | 125 | 179 | 280 | 273 | 155 | 48 | 19 | 6 | 1,153 |
| 1966 | 4 | 5 | 12 | 28 | 81 | 201 | 353 | 273 | 132 | 43 | 12 | 4 | 1,148 |
| 1967 | 9 | 5 | 24 | 48 | 70 | 206 | 278 | 253 | 118 | 45 | 12 | 9 | 1,077 |
| 1968 | 6 | 3 | 9 | 32 | 75 | 204 | 307 | 292 | 145 | 53 | 7 | 4 | 1,137 |
| 1969 | 7 | 4 | 4 | 33 | 94 | 200 | 331 | 304 | 153 | 48 | 8 | 4 | 1,190 |
| 1970 | 3 | 4 | 10 | 36 | 104 | 201 | 323 | 313 | 185 | 48 | 6 | 9 | 1,242 |
| 1971 | 8 | 7 | 10 | 22 | 68 | 244 | 288 | 269 | 182 | 77 | 12 | 17 | 1,204 |
| 1972 | 15 | 6 | 22 | 36 | 88 | 174 | 299 | 276 | 169 | 44 | 9 | 8 | 1,146 |
| 1973 | 7 | 3 | 24 | 18 | 75 | 236 | 318 | 303 | 166 | 66 | 21 | 4 | 1,241 |
| 1974 | 21 | 6 | 28 | 29 | 101 | 173 | 317 | 267 | 120 | 40 | 10 | 5 | 1,117 |
| 1975 | 14 | 11 | 14 | 24 | 117 | 203 | 301 | 296 | 120 | 55 | 12 | 5 | 1,172 |
| 1976 | 5 | 11 | 23 | 27 | 64 | 208 | 282 | 243 | 127 | 27 | 8 | 4 | 1,029 |
| 1977 | 2 | 5 | 21 | 35 | 121 | 212 | 351 | 293 | 180 | 44 | 15 | 6 | 1,285 |
| 1978 | 3 | 1 | 10 | 31 | 93 | 218 | 310 | 300 | 180 | 52 | 19 | 9 | 1,226 |
| 1979 | 4 | 4 | 13 | 32 | 82 | 187 | 295 | 266 | 160 | 53 | 11 | 6 | 1,113 |
| 1980 | 9 | 4 | 13 | 23 | 95 | 199 | 374 | 347 | 192 | 42 | 10 | 5 | 1,313 |
| 1981 | 3 | 6 | 10 | 52 | 75 | 257 | 333 | 275 | 138 | 43 | 12 | 5 | 1,209 |
| 1982 | 6 | 10 | 21 | 26 | 115 | 165 | 318 | 262 | 140 | 47 | 15 | 11 | 1,136 |
| 1983 | 6 | 5 | 9 | 13 | 72 | 193 | 353 | 362 | 172 | 58 | 12 | 5 | 1,260 |
| 1984 | 5 | 6 | 14 | 24 | 92 | 233 | 291 | 312 | 143 | 70 | 9 | 15 | 1,214 |
| 1985 | 3 | 5 | 22 | 39 | 108 | 193 | 313 | 269 | 145 | 68 | 25 | 4 | 1,194 |
| 1986 | 8 | 10 | 17 | 33 | 106 | 231 | 340 | 259 | 161 | 52 | 23 | 9 | 1,249 |
| 1987 | 5 | 7 | 13 | 23 | 127 | 244 | 334 | 298 | 156 | 40 | 14 | 8 | 1,269 |
| 1988 | 5 | 5 | 13 | 28 | 89 | 218 | 359 | 348 | 149 | 45 | 18 | 6 | 1,283 |
| 1989 | 15 | 7 | 19 | 36 | 88 | 208 | 312 | 266 | 138 | 49 | 16 | 2 | 1,156 |
| 1990 | 15 | 14 | 21 | 29 | 86 | 234 | 316 | 291 | 172 | 57 | 16 | 9 | 1,260 |
| 1991 | 10 | 9 | 19 | 42 | 147 | 235 | 336 | 305 | 149 | 62 | 8 | 9 | 1,331 |
| 1992 | 6 | 10 | 15 | 29 | 77 | 170 | 286 | 228 | 150 | 49 | 13 | 7 | 1,040 |
| 1993 | 13 | 5 | 11 | 19 | 91 | 207 | 347 | 317 | 146 | 47 | 11 | 4 | 1,218 |
| 1994 | R7 | R9 | R18 | R37 | R76 | R262 | R328 | R263 | 141 | R50 | R20 | R9 | R1,220 |
| 1995P | 3 | 5 | 14 | 29 | 88 | 211 | 357 | 361 | 153 | 47 | 8 | 6 | 1,283 |
| 1996P | 4 | 8 | 7 | 28 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Normals[1] | 7 | 7 | 16 | 31 | 95 | 208 | 317 | 287 | 154 | 52 | 13 | 7 | 1,193 |

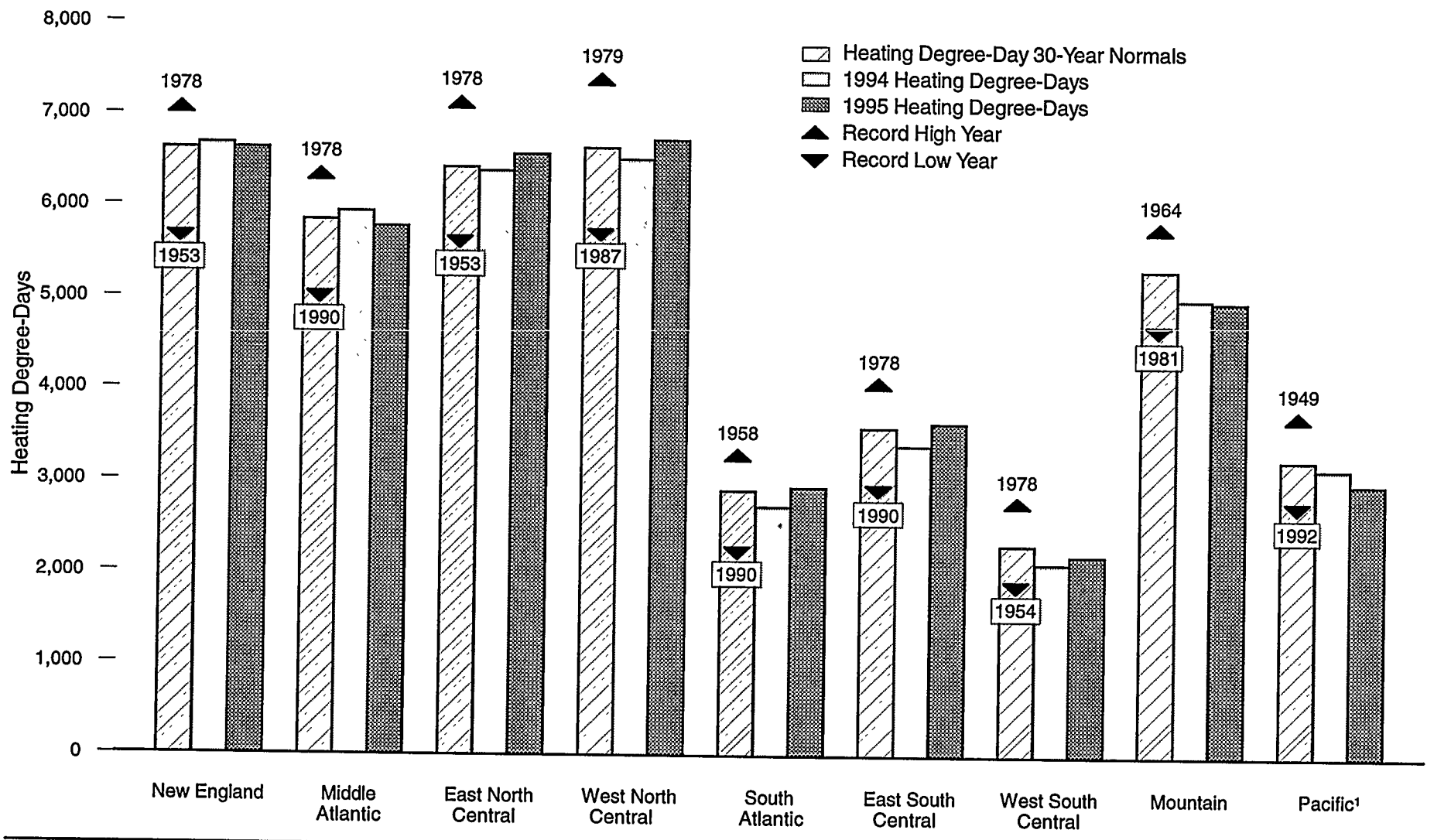
[1] Based on calculations of data from 1961 through 1990.

R=Revised data. P=Preliminary data. NA=Not available.

Notes: • This table excludes Alaska and Hawaii. • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations of the mean daily temperature above 65° F. For example, a weather station recording a mean daily temperature of 78° F would report 13 cooling degree-days. • Temperature information recorded by weather stations is used to calculate statewide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average.

Sources: • 1949-1994 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1995 and 1996—Energy Information Administration, *Monthly Energy Review*, February 1995-April 1996 issues, Table 1.12, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. Data for April 1995 through April 1996 are preliminary and are shown as current year statistics in the May 1995 *MER* through the April 1996 *MER*. Data for January 1995 through March 1995 are final and are shown as previous year statistics in the February 1996 *MER* through the April 1996 *MER*.

## Figure 1.10 Heating Degree-Days by Census Division, 1949-1995




[1] Excludes Alaska and Hawaii.
Note: See Appendix F for Census divisions.

Source: Table 1.10.

# Table 1.10 Heating Degree-Days by Census Division, 1949-1995

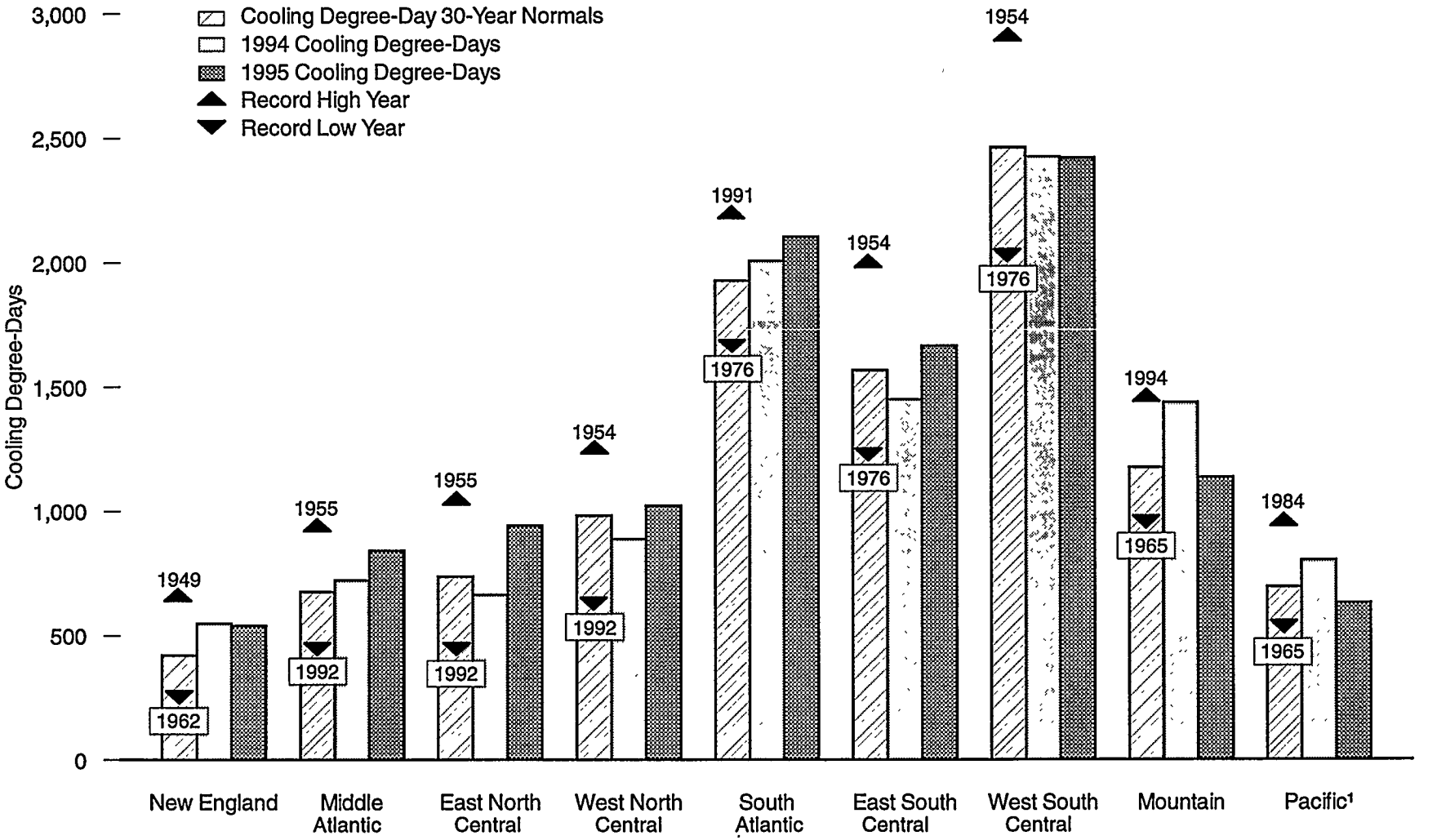
| Year | New England | Middle Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific [1] | United States [1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1949 | 5,829 | 5,091 | 5,801 | 6,479 | 2,367 | 2,942 | 2,133 | 5,483 | 3,729 | 4,234 |
| 1950 | 6,470 | 5,765 | 6,619 | 7,136 | 2,713 | 3,315 | 1,974 | 4,930 | 3,355 | 4,536 |
| 1951 | 6,137 | 5,497 | 6,549 | 7,246 | 2,728 | 3,340 | 2,154 | 5,513 | 3,469 | 4,547 |
| 1952 | 6,180 | 5,443 | 5,977 | 6,386 | 2,684 | 3,276 | 2,074 | 5,404 | 3,586 | 4,374 |
| 1953 | 5,650 | 5,027 | 5,626 | 5,994 | 2,486 | 3,132 | 2,024 | 4,925 | 3,224 | 4,063 |
| 1954 | 6,291 | 5,473 | 5,841 | 6,063 | 2,713 | 3,211 | 1,876 | 4,679 | 3,296 | 4,232 |
| 1955 | 6,577 | 5,708 | 6,101 | 6,630 | 2,786 | 3,314 | 2,083 | 5,517 | 3,723 | 4,521 |
| 1956 | 6,702 | 5,731 | 6,019 | 6,408 | 2,642 | 3,113 | 2,032 | 5,146 | 3,382 | 4,387 |
| 1957 | 6,158 | 5,469 | 6,166 | 6,525 | 2,594 | 3,112 | 2,068 | 5,203 | 3,322 | 4,339 |
| 1958 | 6,907 | 6,237 | 6,585 | 6,585 | 3,271 | 4,004 | 2,590 | 4,929 | 2,819 | 4,712 |
| 1959 | 6,363 | 5,535 | 6,303 | 6,665 | 2,698 | 3,415 | 2,398 | 5,138 | 2,925 | 4,403 |
| 1960 | 6,561 | 5,901 | 6,544 | 6,884 | 3,147 | 3,958 | 2,551 | 5,328 | 3,309 | 4,724 |
| 1961 | 6,632 | 5,895 | 6,275 | 6,591 | 2,869 | 3,497 | 2,296 | 5,299 | 3,221 | 4,540 |
| 1962 | 6,981 | 6,089 | 6,545 | 6,691 | 3,022 | 3,627 | 2,264 | 5,165 | 3,400 | 4,694 |
| 1963 | 6,816 | 6,103 | 6,691 | 6,485 | 3,138 | 3,890 | 2,438 | 5,060 | 3,326 | 4,734 |
| 1964 | 6,594 | 5,694 | 6,030 | 6,303 | 2,828 | 3,462 | 2,272 | 5,769 | 3,583 | 4,515 |
| 1965 | 6,825 | 5,933 | 6,284 | 6,646 | 2,830 | 3,374 | 2,078 | 5,318 | 3,378 | 4,549 |
| 1966 | 6,662 | 6,012 | 6,606 | 6,872 | 3,118 | 3,758 | 2,416 | 5,275 | 3,170 | 4,700 |
| 1967 | 6,987 | 6,127 | 6,477 | 6,569 | 2,864 | 3,403 | 2,082 | 5,232 | 3,316 | 4,609 |
| 1968 | 6,800 | 5,981 | 6,331 | 6,556 | 3,160 | 3,927 | 2,522 | 5,415 | 3,198 | 4,675 |
| 1969 | 6,593 | 5,933 | 6,603 | 6,903 | 3,205 | 3,910 | 2,325 | 5,324 | 3,377 | 4,736 |
| 1970 | 6,839 | 5,943 | 6,455 | 6,835 | 2,997 | 3,685 | 2,396 | 5,436 | 3,257 | 4,664 |
| 1971 | 6,695 | 5,761 | 6,236 | 6,594 | 2,763 | 3,395 | 1,985 | 5,585 | 3,698 | 4,547 |
| 1972 | 7,001 | 6,064 | 6,772 | 7,094 | 2,759 | 3,438 | 2,259 | 5,352 | 3,376 | 4,705 |
| 1973 | 6,120 | 5,327 | 5,780 | 6,226 | 2,718 | 3,309 | 2,256 | 5,562 | 3,383 | 4,313 |
| 1974 | 6,621 | 5,670 | 6,259 | 6,478 | 2,551 | 3,171 | 2,080 | 5,281 | 3,294 | 4,406 |
| 1975 | 6,362 | 5,477 | 6,169 | 6,678 | 2,640 | 3,336 | 2,187 | 5,693 | 3,623 | 4,472 |
| 1976 | 6,839 | 6,097 | 6,768 | 6,670 | 3,040 | 3,881 | 2,446 | 5,303 | 3,115 | 4,726 |
| 1977 | 6,579 | 5,889 | 6,538 | 6,506 | 3,047 | 3,812 | 2,330 | 5,060 | 3,135 | 4,605 |
| 1978 | 7,061 | 6,330 | 7,095 | 7,324 | 3,187 | 4,062 | 2,764 | 5,370 | 3,168 | 4,958 |
| 1979 | 6,348 | 5,851 | 6,921 | 7,369 | 2,977 | 3,900 | 2,694 | 5,564 | 3,202 | 4,781 |
| 1980 | 6,900 | 6,143 | 6,792 | 6,652 | 3,099 | 3,855 | 2,378 | 5,052 | 2,986 | 4,707 |
| 1981 | 6,612 | 5,989 | 6,446 | 6,115 | 3,177 | 3,757 | 2,162 | 4,671 | 2,841 | 4,512 |
| 1982 | 6,697 | 5,866 | 6,542 | 7,000 | 2,721 | 3,357 | 2,227 | 5,544 | 3,449 | 4,619 |
| 1983 | 6,305 | 5,733 | 6,423 | 6,901 | 3,057 | 3,892 | 2,672 | 5,359 | 3,073 | 4,627 |
| 1984 | 6,442 | 5,777 | 6,418 | 6,582 | 2,791 | 3,451 | 2,194 | 5,592 | 3,149 | 4,514 |
| 1985 | 6,571 | 5,660 | 6,546 | 7,119 | 2,736 | 3,602 | 2,466 | 5,676 | 3,441 | 4,642 |
| 1986 | 6,517 | 5,665 | 6,150 | 6,231 | 2,686 | 3,294 | 2,058 | 4,870 | 2,807 | 4,295 |
| 1987 | 6,546 | 5,699 | 5,810 | 5,712 | 2,937 | 3,466 | 2,292 | 5,153 | 3,013 | 4,334 |
| 1988 | 6,715 | 6,088 | 6,590 | 6,634 | 3,122 | 3,800 | 2,346 | 5,148 | 2,975 | 4,653 |
| 1989 | 6,887 | 6,134 | 6,834 | 6,996 | 2,944 | 3,713 | 2,439 | 5,173 | 3,061 | 4,726 |
| 1990 | 5,848 | 4,998 | 5,681 | 6,011 | 2,230 | 2,929 | 1,944 | 5,146 | 3,148 | 4,016 |
| 1991 | 5,960 | 5,177 | 5,906 | 6,319 | 2,503 | 3,211 | 2,178 | 5,259 | 3,109 | 4,200 |
| 1992 | 6,844 | 5,964 | 6,297 | 6,262 | 2,852 | 3,498 | 2,145 | 5,054 | 2,763 | 4,441 |
| 1993 | 6,728 | 5,948 | 6,646 | 7,168 | 2,981 | 3,768 | 2,489 | 5,514 | 3,052 | 4,900 |
| 1994 | R6,672 | R5,934 | R6,378 | R6,509 | R2,724 | R3,394 | R2,108 | R5,002 | R3,155 | R4,483 |
| 1995P | 6,626 | 5,772 | 6,564 | 6,720 | 2,935 | 3,644 | 2,193 | 4,978 | 2,987 | 4,536 |
| Normals [2] | 6,621 | 5,839 | 6,421 | 6,635 | 2,895 | 3,589 | 2,306 | 5,321 | 3,245 | 4,576 |

[1] Excludes Alaska and Hawaii.
[2] Based on calculations of data from 1961 through 1990.
R=Revised data. P=Preliminary data.

Notes: • Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 65° F. For example, a weather station recording a mean daily temperature of 40° F would report 25 heating degree-days. • Temperature information recorded by weather stations is used to calculate statewide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix F for Census divisions.

Sources: • 1949-1994 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-1. • 1995—Energy Information Administration, *Monthly Energy Review*, February 1995-January 1996 issues, Table 1.11, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland. Data for 1995 are the sums of the current year monthly statistics shown in the cited issues of the *MER*.

## Figure 1.11 Cooling Degree-Days by Census Division, 1949-1995




[1] Excludes Alaska and Hawaii.

Note: See Appendix F for Census divisions.

Source: Table 1.11.

# Table 1.11 Cooling Degree-Days by Census Division, 1949-1995

| Year | New England | Middle Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific [1] | United States [1] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1949 | 654 | 901 | 949 | 1,038 | 2,128 | 1,776 | 2,510 | 1,198 | 593 | 1,318 |
| 1950 | 353 | 542 | 602 | 729 | 1,919 | 1,568 | 2,473 | 1,120 | 597 | 1,110 |
| 1951 | 400 | 653 | 644 | 777 | 2,028 | 1,781 | 2,684 | 1,137 | 593 | 1,195 |
| 1952 | 581 | 825 | 897 | 1,109 | 2,097 | 1,864 | 2,543 | 1,278 | 657 | 1,318 |
| 1953 | 441 | 768 | 945 | 1,183 | 2,137 | 1,893 | 2,727 | 1,193 | 571 | 1,326 |
| 1954 | 303 | 646 | 858 | 1,250 | 2,082 | 1,998 | 2,907 | 1,292 | 590 | 1,315 |
| 1955 | 602 | 934 | 1,043 | 1,238 | 2,045 | 1,791 | 2,643 | 1,124 | 560 | 1,344 |
| 1956 | 336 | 566 | 750 | 1,155 | 1,913 | 1,685 | 2,833 | 1,247 | 596 | 1,221 |
| 1957 | 428 | 738 | 754 | 1,004 | 2,050 | 1,692 | 2,465 | 1,155 | 660 | 1,230 |
| 1958 | 344 | 592 | 638 | 878 | 1,922 | 1,582 | 2,517 | 1,328 | 836 | 1,189 |
| 1959 | 532 | 903 | 997 | 1,083 | 2,128 | 1,745 | 2,456 | 1,258 | 776 | 1,348 |
| 1960 | 368 | 640 | 722 | 961 | 1,926 | 1,613 | 2,492 | 1,308 | 770 | 1,206 |
| 1961 | 482 | 787 | 745 | 867 | 1,888 | 1,370 | 2,230 | 1,223 | 709 | 1,168 |
| 1962 | 264 | 561 | 742 | 974 | 1,908 | 1,738 | 2,700 | 1,147 | 559 | 1,179 |
| 1963 | 373 | 571 | 712 | 1,196 | 1,812 | 1,580 | 2,899 | 1,235 | 605 | 1,204 |
| 1964 | 312 | 634 | 787 | 1,030 | 1,905 | 1,591 | 2,608 | 1,095 | 574 | 1,185 |
| 1965 | 352 | 638 | 688 | 914 | 1,931 | 1,634 | 2,579 | 961 | 542 | 1,153 |
| 1966 | 421 | 731 | 724 | 919 | 1,788 | 1,440 | 2,309 | 1,239 | 680 | 1,148 |
| 1967 | 420 | 602 | 548 | 713 | 1,697 | 1,257 | 2,385 | 1,120 | 817 | 1,077 |
| 1968 | 410 | 725 | 740 | 902 | 1,842 | 1,517 | 2,247 | 1,015 | 632 | 1,137 |
| 1969 | 447 | 706 | 701 | 940 | 1,887 | 1,572 | 2,505 | 1,228 | 680 | 1,190 |
| 1970 | 479 | 779 | 827 | 1,066 | 2,007 | 1,662 | 2,375 | 1,163 | 689 | 1,242 |
| 1971 | 465 | 730 | 783 | 960 | 1,932 | 1,577 | 2,448 | 1,074 | 685 | 1,204 |
| 1972 | 364 | 614 | 643 | 908 | 1,843 | 1,525 | 2,513 | 1.141 | 698 | 1,146 |
| 1973 | 551 | 830 | 864 | 1,009 | 2,000 | 1,665 | 2,359 | 1,123 | 624 | 1,241 |
| 1974 | 393 | 614 | 626 | 878 | 1,842 | 1,382 | 2,342 | 1,188 | 690 | 1,117 |
| 1975 | 467 | 708 | 788 | 1,003 | 2,011 | 1,520 | 2,261 | 1,031 | 547 | 1,172 |
| 1976 | 402 | 597 | 619 | 939 | 1,675 | 1,232 | 2,035 | 1,058 | 620 | 1,029 |
| 1977 | 407 | 689 | 823 | 1,122 | 2,020 | 1,808 | 2,720 | 1,256 | 715 | 1,285 |
| 1978 | 378 | 615 | 741 | 1,027 | 1,972 | 1,685 | 2,638 | 1,174 | 738 | 1,226 |
| 1979 | 434 | 588 | 618 | 871 | 1,833 | 1,412 | 2,242 | 1,164 | 770 | 1,113 |
| 1980 | 487 | 793 | 816 | 1,217 | 2,075 | 1,834 | 2,734 | 1,202 | 658 | 1,313 |
| 1981 | 436 | 657 | 658 | 924 | 1,889 | 1,576 | 2,498 | 1,331 | 876 | 1,209 |
| 1982 | 321 | 541 | 643 | 859 | 1,958 | 1,537 | 2,502 | 1,121 | 619 | 1,136 |
| 1983 | 538 | 799 | 934 | 1,178 | 1,925 | 1,579 | 2,288 | 1,174 | 776 | 1,260 |
| 1984 | 468 | 649 | 724 | 955 | 1,865 | 1,508 | 2,469 | 1,190 | 956 | 1,214 |
| 1985 | 372 | 627 | 643 | 830 | 2,004 | 1,596 | 2,599 | 1,210 | 737 | 1,194 |
| 1986 | 301 | 626 | 738 | 1,021 | 2,149 | 1,792 | 2,618 | 1,188 | 664 | 1,249 |
| 1987 | 406 | 729 | 918 | 1,115 | 2,067 | 1,718 | 2,368 | 1,196 | 706 | 1,269 |
| 1988 | 545 | 782 | 975 | 1,230 | 1,923 | 1,582 | 2,422 | 1,320 | 729 | 1,283 |
| 1989 | 426 | 658 | 652 | 864 | 1,977 | 1,417 | 2,295 | 1,330 | 685 | 1,156 |
| 1990 | 477 | 656 | 647 | 983 | 2,143 | 1,622 | 2,579 | 1,294 | 827 | 1,260 |
| 1991 | 511 | 854 | 959 | 1,125 | 2,197 | 1,758 | 2,499 | 1,182 | 672 | 1,331 |
| 1992 | 276 | 460 | 449 | 637 | 1,777 | 1,293 | 2,201 | 1,206 | 905 | 1,040 |
| 1993 | 486 | 764 | 735 | 817 | 2,092 | 1,622 | 2,369 | 1,113 | 708 | 1,218 |
| 1994 | 548 | R722 | R664 | R887 | R2,005 | R1,448 | R2,422 | R1,436 | R801 | R1,220 |
| 1995P | 540 | 842 | 942 | 1,022 | 2,103 | 1,664 | 2,418 | 1,134 | 629 | 1,283 |
| Normals[2] | 421 | 675 | 736 | 981 | 1,926 | 1,565 | 2,460 | 1,174 | 694 | 1,193 |

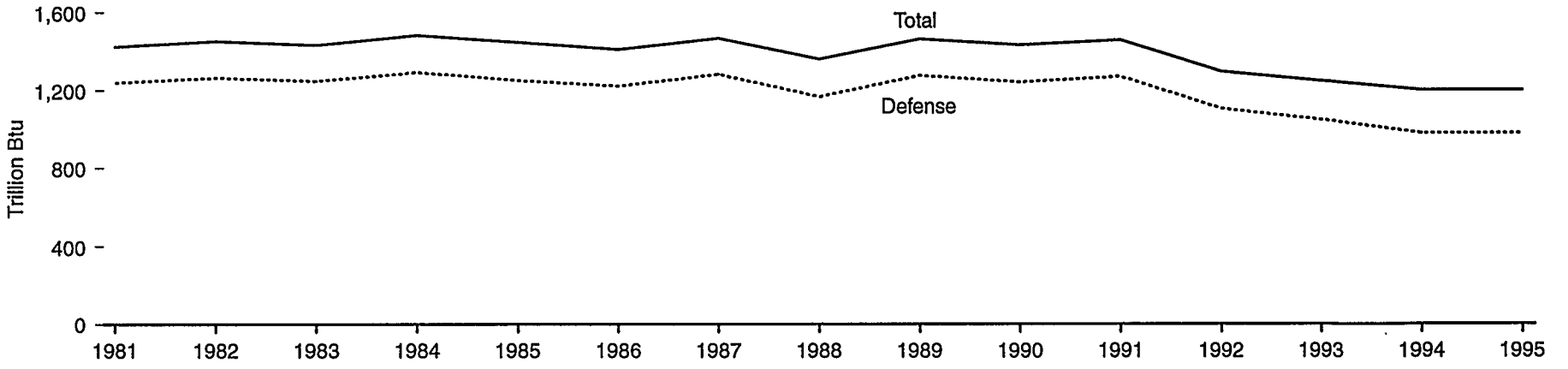
[1] Excludes Alaska and Hawaii.
[2] Based on calculations of data from 1961 through 1990.
R=Revised data. P=Preliminary data.

Notes: • Degree-days are relative measurements of outdoor air temperature. Cooling degree-days are deviations of the mean daily temperature above 65° F. For example, a weather station recording a mean daily temperature of 78° F would report 13 cooling degree-days. • Temperature information recorded by weather stations is used to calculate statewide degree-day averages based on resident State population estimated for 1990. The population-weighted State figures are aggregated into Census divisions and the national average. • See Appendix F for Census divisions.

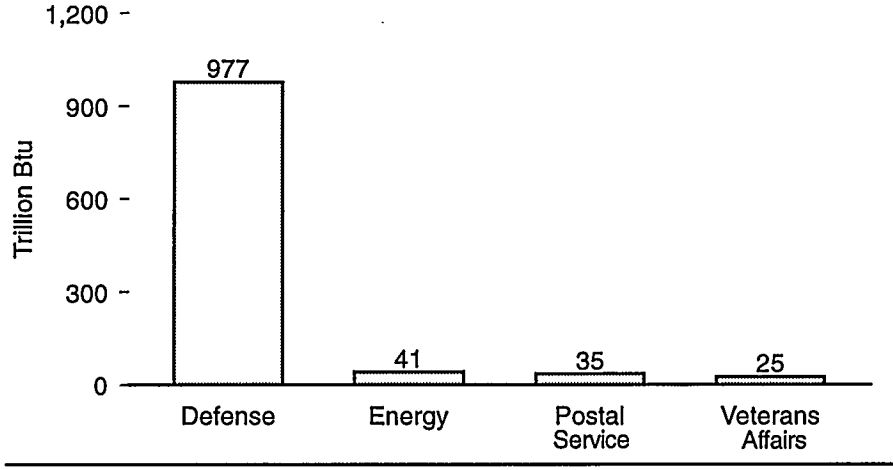
Sources: • 1949-1994 and Normals—U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, Asheville, North Carolina. Historical Climatology Series 5-2. • 1995—Energy Information Administration, *Monthly Energy Review*, January 1996 issue, Table 1.12, which reports data from NOAA, National Weather Service Climate Analysis Center, Camp Springs, Maryland.

## Figure 1.12 U.S. Government Energy Consumption, Fiscal Years

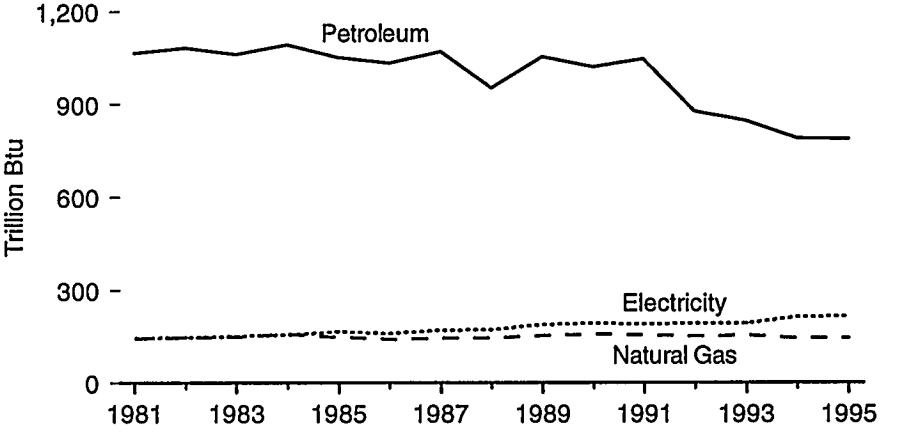
**Total and U.S. Department of Defense, 1981-1995**




**Top Four Consuming Agencies, 1995**




**By Major Energy Source, 1981-1995**




Notes: • The U.S. Government's fiscal year runs from October 1 through September 30.
• Because vertical scales differ, graphs should not be compared.

Source: Table 1.12.

# Table 1.12 U.S. Government Energy Consumption, Fiscal Years 1981-1995

(Trillion Btu)

| Category | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total, All Agencies** | 1,424.2 | 1,451.4 | 1,431.8 | 1,482.5 | R1,445.5 | 1,410.1 | 1,465.6 | 1,359.8 | 1,463.7 | 1,433.0 | R1,456.4 | R1,295.4 | R1,247.9 | R1,200.9 | 1,201.1 |
| Defense | 1,239.5 | 1,264.5 | 1,248.3 | 1,292.1 | 1,250.6 | 1,222.8 | 1,280.5 | 1,165.8 | 1,274.4 | 1,241.7 | 1,269.3 | 1,104.0 | 1,048.8 | R977.0 | 977.0 |
| Energy | 47.3 | 49.0 | 49.5 | 51.6 | R52.3 | 49.9 | 48.2 | 49.8 | 43.9 | 43.4 | 41.8 | 44.4 | 43.6 | 41.2 | 41.2 |
| Postal Service | 27.9 | 27.5 | 26.5 | 27.7 | 27.8 | 28.0 | 28.5 | 29.6 | 30.3 | 30.6 | 30.8 | 31.7 | 33.7 | 35.0 | 35.0 |
| Veterans Affairs | 24.0 | 24.2 | 24.1 | 24.6 | 25.1 | 25.0 | 24.9 | 26.3 | 26.2 | 24.9 | R25.1 | 25.3 | 25.7 | R25.6 | 25.4 |
| Transportation | 18.8 | 19.1 | 19.4 | 19.8 | 19.5 | 19.4 | 19.0 | 18.7 | 18.5 | 19.0 | R17.9 | R18.4 | R20.7 | R19.7 | 18.4 |
| General Services Administration | 18.0 | 18.1 | 16.1 | 16.2 | 17.3 | 14.0 | 13.1 | 12.4 | 12.7 | 14.2 | 14.0 | 13.8 | 14.1 | 14.0 | 13.7 |
| NASA | 10.0 | 10.1 | 10.3 | 10.6 | 10.8 | 11.2 | 11.1 | 11.2 | 12.1 | 12.3 | 12.4 | 12.5 | 12.4 | R12.7 | 12.4 |
| Justice | 5.4 | 5.8 | 5.5 | 6.4 | 8.2 | 8.6 | 8.1 | 9.4 | 7.7 | 7.0 | 8.0 | 7.5 | 9.1 | 10.3 | 10.3 |
| Agriculture | 7.9 | 7.6 | 7.4 | 7.9 | 8.4 | 6.8 | 7.3 | 7.8 | 8.7 | 9.5 | 9.6 | 9.1 | 9.3 | R9.4 | 9.4 |
| Health and Human Services | 6.7 | 6.4 | 6.2 | 6.4 | 7.0 | 6.2 | 6.6 | 6.4 | 6.7 | 8.0 | 7.1 | 8.0 | 8.1 | R8.4 | 8.4 |
| Interior | 7.6 | 7.4 | 7.7 | 8.4 | 7.8 | 6.9 | 6.6 | 7.0 | 7.1 | 7.4 | R7.1 | 7.0 | 7.5 | R7.9 | 7.9 |
| Other [1] | 11.1 | 11.6 | 10.8 | 10.7 | 10.7 | 11.3 | 11.6 | 15.5 | 15.3 | 15.1 | 13.4 | 13.8 | 14.7 | [2]39.8 | 42.1 |
| **Total, All Sources** | 1,424.2 | 1,451.4 | 1,431.8 | 1,482.5 | R1,445.5 | 1,410.1 | 1,465.6 | 1,359.8 | 1,463.7 | 1,433.0 | R1,456.4 | R1,295.4 | R1,247.9 | R1,200.9 | 1,201.1 |
| Petroleum | 1,066.1 | 1,082.7 | 1,061.1 | 1,093.8 | 1,052.9 | 1,032.3 | 1,069.8 | 952.3 | 1,054.4 | 1,020.5 | R1,048.5 | R878.0 | R845.4 | R790.3 | 788.4 |
| Jet Fuel | 653.3 | 672.7 | 673.4 | 693.7 | 705.7 | 710.2 | 702.3 | 617.2 | 761.7 | 732.4 | 774.5 | R628.2 | R612.4 | R550.7 | 550.1 |
| Distillate and Residual Fuel Oil | 351.3 | 349.4 | 329.5 | 342.9 | 290.8 | 271.5 | 319.4 | 284.7 | 245.1 | 244.1 | R235.9 | R205.1 | R192.1 | R202.4 | 202.1 |
| Motor Gasoline | 53.2 | 53.1 | 51.6 | 51.2 | 50.5 | 45.3 | 43.1 | 41.2 | 41.1 | 37.2 | R34.0 | 35.6 | 34.5 | R29.6 | 29.5 |
| Liquefied Petroleum Gases | 3.7 | 3.9 | 4.0 | 4.1 | 4.0 | 3.9 | 4.0 | 3.2 | 5.7 | 6.3 | 3.7 | 8.1 | 5.7 | R7.0 | 6.2 |
| Aviation Gasoline | 4.6 | 3.6 | 2.6 | 1.9 | 1.9 | 1.4 | 1.0 | 6.0 | 0.8 | 0.5 | 0.4 | 1.0 | 0.7 | R0.6 | 0.5 |
| Electricity | 144.5 | 147.5 | 151.5 | 155.9 | R165.7 | 159.1 | 169.7 | 171.1 | 188.3 | 192.4 | 190.0 | 191.5 | 192.3 | [2]213.6 | 215.6 |
| Natural Gas | 142.2 | 146.2 | 147.8 | 157.4 | R149.1 | 141.4 | 145.4 | 144.3 | 151.9 | 157.1 | 153.8 | 151.2 | 153.1 | R143.7 | 144.1 |
| Coal | 65.1 | 68.6 | 62.4 | 65.3 | 64.0 | 63.8 | 67.0 | 60.2 | 48.6 | 44.2 | 45.9 | 51.8 | 38.5 | 35.0 | 35.0 |
| Purchased Steam | 6.2 | 6.2 | 9.0 | 10.1 | 13.8 | 13.5 | 13.7 | 31.9 | 20.6 | 18.8 | 18.2 | 22.8 | 18.7 | 18.3 | 18.0 |

[1] Includes National Archives and Records Administration, U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority (TVA), U.S. Department of Labor, National Science Foundation (NSF), Federal Trade Commission, Federal Communications Commission, Environmental Protection Agency (EPA), U.S. Department of Housing and Urban Development, Railroad Retirement Board, Commodity Futures Trading Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, U.S. Department of State, U.S. Department of Treasury, Small Business Administration, Office of Personnel Management, Federal Emergency Management Agency, and U.S. Information Agency.

[2] Increase from previous years is result of initial reporting by TVA of electricity consumed for utility station service use.

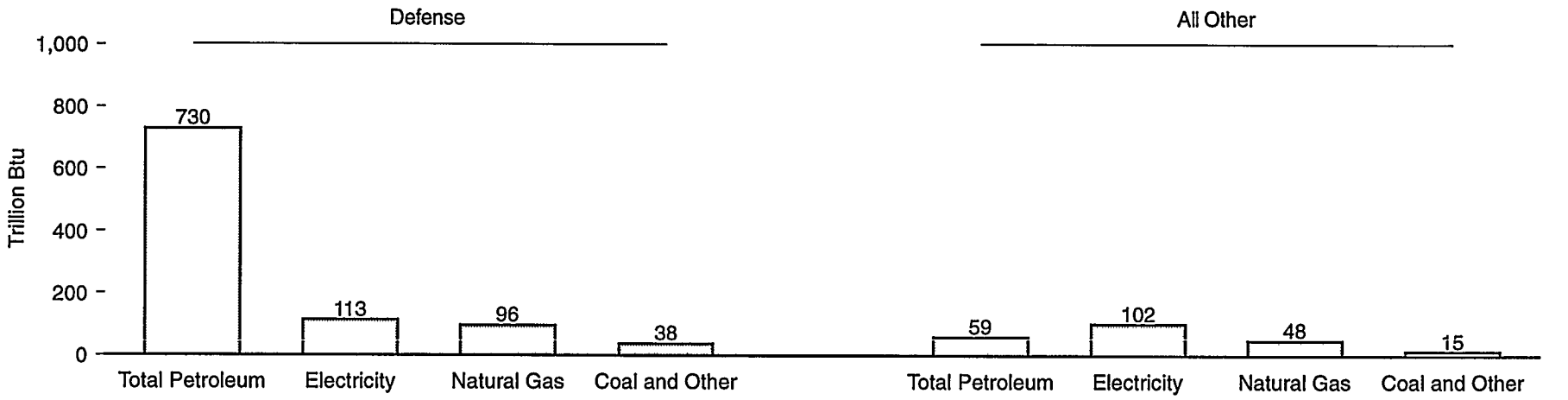
R = Revised data. P = Preliminary data. Other estimated data are those of EPA 1982 and 1988, U.S. Department of Treasury 1982 and 1983, and NSF 1988, 1989, and 1990.

Notes: • This table uses a conversion factor for electricity of 3,412 Btu per kilowatthour and a conversion factor for purchased steam of 1,000 Btu per pound. • These data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. However, other energy used by U.S. agencies that produce electricity or enriched uranium is included. • The U.S. Government's fiscal year runs from October 1 through September 30. • Totals may not equal sum of components due to independent rounding.

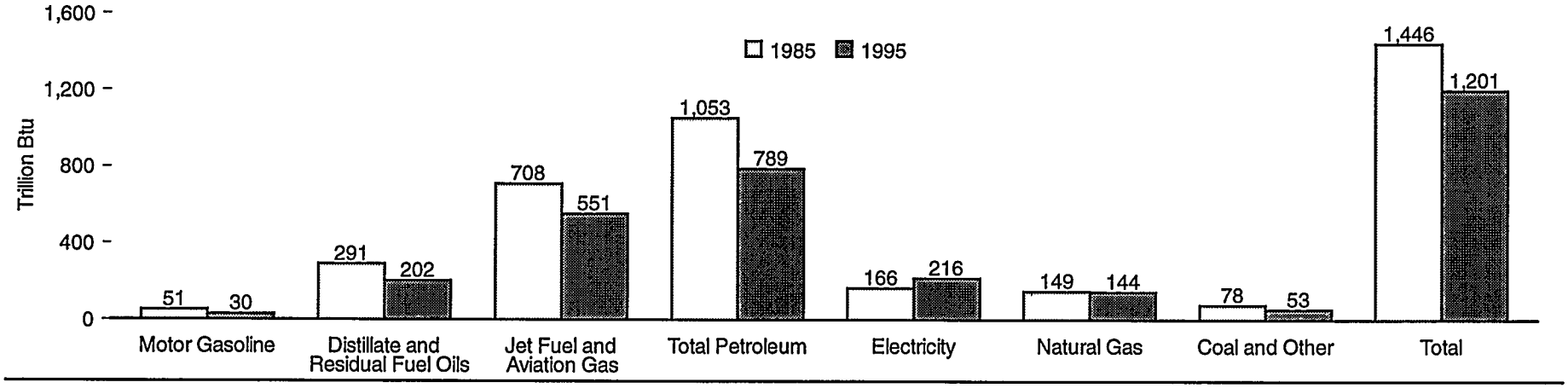
Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

## Figure 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years

**By Agency, 1995**




**By Source, 1985 and 1995**




Notes: • The U.S. Government's fiscal year runs from October 1 through September 30.
• Because vertical scales differ, graphs should not be compared.

Source: Table 1.13.

# Table 1.13 U.S. Government Energy Consumption by Agency and Source, Fiscal Years 1985 and 1995

(Trillion Btu)

| Agency | Petroleum | | | | | Electricity | Natural Gas | Coal and Other [2] | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Motor Gasoline | Distillate and Residual Fuel Oils | Jet Fuel and Aviation Gas | Other [1] | Total | | | | |
| **Total, 1985** | **50.5** | **290.8** | **707.6** | **4.0** | **1,052.9** | **165.7** | **149.1** | **77.8** | **1,445.5** |
| Defense | 25.4 | 265.0 | 699.3 | 2.3 | 992.1 | 101.1 | 106.4 | 51.0 | 1,250.6 |
| Energy | 1.5 | 3.6 | 0.5 | 0.2 | 5.7 | 18.8 | 6.8 | 21.0 | 52.3 |
| Postal Service | 9.9 | 3.1 | 0.0 | 0.2 | 13.2 | 9.6 | 4.5 | 0.5 | 27.8 |
| Veterans Affairs | 0.5 | 2.2 | 0.0 | 0.0 | 2.8 | 7.2 | 13.9 | 1.3 | 25.1 |
| Transportation | 1.3 | 8.0 | 5.5 | 0.0 | 14.8 | 3.8 | 0.9 | 0.0 | 19.5 |
| General Services Administration | 0.1 | 1.1 | 0.0 | 0.0 | 1.2 | 10.3 | 3.3 | 2.5 | 17.3 |
| NASA | 0.3 | 0.8 | 1.6 | 0.0 | 2.7 | 5.2 | 2.6 | 0.3 | 10.8 |
| Interior | 4.0 | 0.9 | -0.1 | 0.3 | 5.2 | 1.6 | 1.5 | 0.1 | 8.4 |
| Agriculture | 1.8 | 0.4 | 0.1 | 0.1 | 2.4 | 1.2 | 4.2 | 0.4 | 8.2 |
| Health and Human Services | 2.2 | 1.6 | 0.1 | 0.8 | 4.6 | 1.5 | 1.4 | 0.2 | 7.8 |
| Justice | 0.4 | 2.1 | 0.0 | 0.1 | 2.6 | 2.5 | 1.9 | 0.1 | 7.0 |
| Other [3] | 2.9 | 2.1 | 0.4 | 0.0 | 5.4 | 3.0 | 1.9 | 0.4 | 10.7 |
| **Total, 1995 [P]** | **29.5** | **202.1** | **550.7** | **6.2** | **788.5** | **215.6** | **144.1** | **53.0** | **1,201.1** |
| Defense | 4.3 | 182.3 | 540.8 | 2.1 | 729.5 | 113.3 | 95.9 | 38.4 | 977.0 |
| Energy | 1.2 | 2.4 | 0.4 | 0.4 | 4.3 | 17.1 | 9.8 | 10.0 | 41.2 |
| Postal Service | 11.2 | 3.2 | 0.0 | 0.0 | 14.3 | 14.0 | 6.0 | 0.6 | 35.0 |
| Veterans Affairs | 0.3 | 1.4 | 0.0 | 0.0 | 1.6 | 8.9 | 13.6 | 1.3 | 25.4 |
| Transportation | 0.6 | 5.7 | 5.7 | 1.2 | 13.3 | 4.1 | 0.9 | 0.1 | 18.4 |
| General Services Administration | 0.1 | 0.3 | 0.0 | 0.0 | 0.3 | 9.1 | 2.8 | 1.4 | 13.7 |
| NASA | 0.3 | 0.6 | 1.4 | 0.0 | 2.3 | 6.9 | 3.0 | 0.2 | 12.4 |
| Justice | 2.5 | 0.5 | 0.8 | 0.0 | 3.8 | 2.6 | 3.6 | 0.2 | 10.3 |
| Agriculture | 4.6 | 0.6 | 0.2 | 0.2 | 5.6 | 2.1 | 1.6 | 0.1 | 9.4 |
| Health and Human Services | 0.2 | 1.3 | 0.0 | 0.3 | 1.7 | 3.4 | 3.3 | 0.0 | 8.4 |
| Interior | 2.1 | 1.3 | 0.2 | 2.0 | 5.5 | 1.8 | 0.5 | 0.1 | 7.9 |
| Other [4] | 2.2 | 2.6 | 1.3 | 0.0 | 6.2 | 32.4 | 3.0 | 0.6 | 42.1 |

[1] Includes liquefied petroleum gases and other.

[2] Includes purchased steam, coal, and other.

[3] Includes U.S. Department of Commerce, Panama Canal Commission, Tennessee Valley Authority, U.S. Department of Labor, National Science Foundation, U.S. Department of Housing and Urban Development, Federal Communications Commission, Office of Personnel Management, U.S. Department of State, U.S. Department of Treasury, Small Business Administration, and Environmental Protection Agency.

[4] Includes National Archives and Records Administration, U.S. Department of Commerce, U.S. Department of Labor, U.S. Department of State, Environmental Protection Agency, Federal Communications Commission, Federal Trade Commission, Panama Canal Commission, Equal Employment Opportunity Commission, Nuclear Regulatory Commission, Office of Personnel Management, U.S. Department of Housing and Urban Development, U.S. Department of Treasury, Railroad Retirement Board, Tennessee Valley Authority, Federal Emergency Management Agency, and U.S. Information Agency.

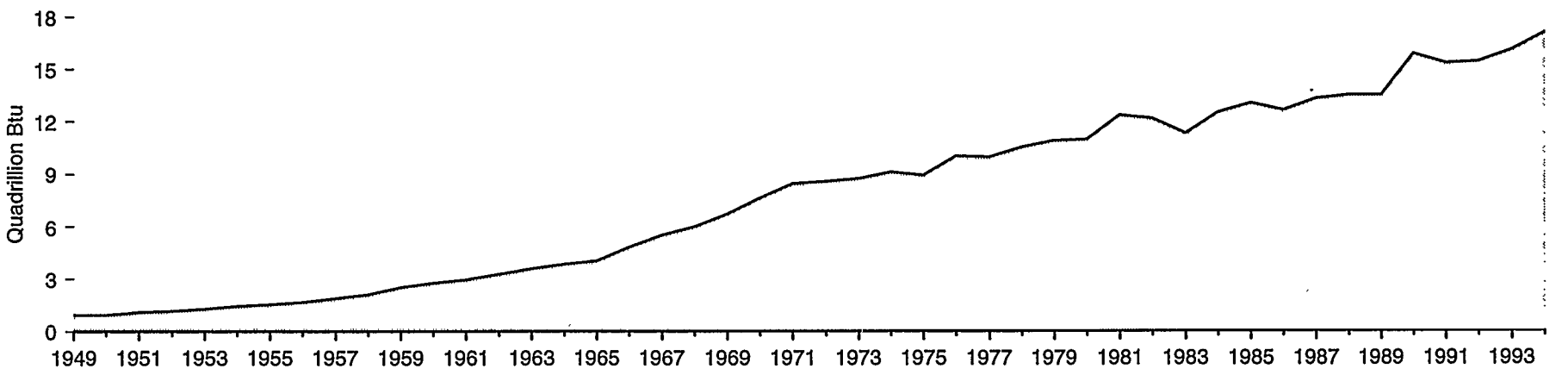
R=Revised data. P=Preliminary data.

Notes: • This table uses a conversion factor for electricity of 3,412 Btu per kilowatthour and a conversion factor for purchased steam of 1,000 Btu per pound. • These data include energy consumed at foreign installations and in foreign operations, including aviation and ocean bunkering, primarily by the U.S. Department of Defense. U.S. Government energy use for electricity generation and uranium enrichment is excluded. However, other energy used by U.S. agencies that produce electricity or enriched uranium is included. • The U.S. Government's fiscal year runs from October 1 through September 30. • Totals may not equal sum of components due to independent rounding.

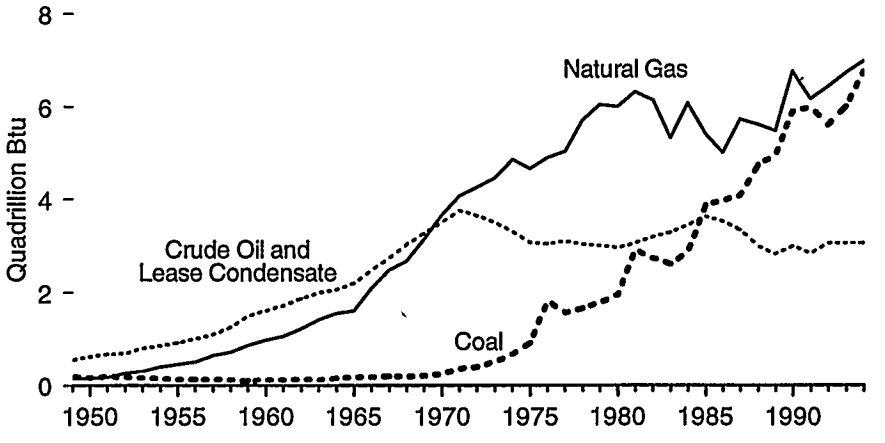
Source: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Office of Federal Energy Management Programs.

## Figure 1.14 Fossil Fuel Production on Federally Administered Lands

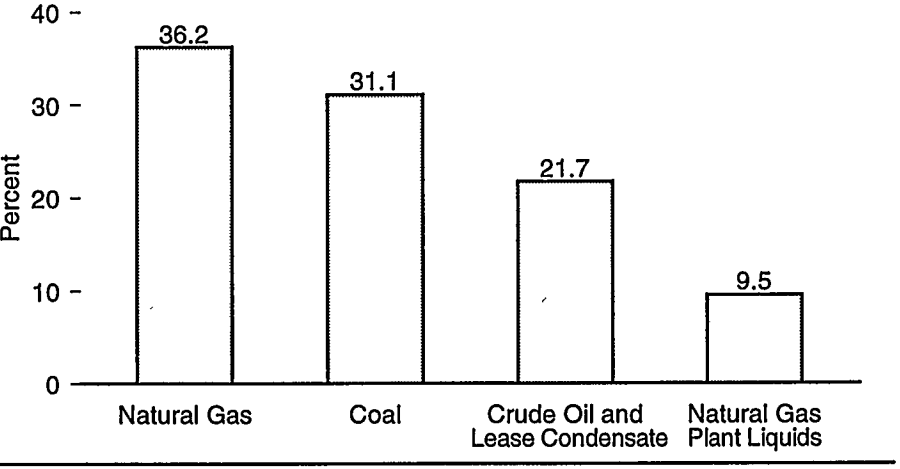
**Total, 1949-1994**




**By Source, 1949-1994**




**Production on Federal Lands as Share of U.S. Total Production, by Source, 1994**




Notes: • Federally Administered Lands include all classes of land owned by the Federal Government, including acquired military, Outer Continental Shelf, and public lands. • Because vertical scales differ, graphs should not be compared.

Source: Table 1.14.

# Table 1.14 Fossil Fuel Production on Federally Administered Lands, 1949-1994

| Year | Crude Oil and Lease Condensate [1] | | | Natural Gas Plant Liquids [2] | | | Natural Gas [3] | | | Coal [4] | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Million Barrels | Quadrillion Btu | Percent U.S. Total [5] | Million Barrels | Quadrillion Btu | Percent U.S. Total [5] | Trillion Cubic Feet | Quadrillion Btu | Percent U.S. Total [5] | Million Short Tons | Quadrillion Btu | Percent U.S. Total [5] | Quadrillion Btu | Percent U.S. Total |
| 1949 | 95.2 | 0.55 | 5.2 | 4.4 | 0.02 | 2.8 | 0.15 | 0.15 | 2.8 | 9.5 | 0.20 | 2.0 | 0.92 | 3.2 |
| 1950 | 105.9 | 0.61 | 5.4 | 4.4 | 0.02 | 2.4 | 0.14 | 0.15 | 2.4 | 7.7 | 0.16 | 1.4 | 0.94 | 2.9 |
| 1951 | 117.3 | 0.68 | 5.2 | 5.3 | 0.02 | 2.6 | 0.17 | 0.18 | 2.4 | 9.3 | 0.20 | 1.6 | 1.08 | 3.0 |
| 1952 | 118.7 | 0.69 | 5.2 | 5.5 | 0.02 | 2.5 | 0.25 | 0.25 | 3.2 | 8.7 | 0.18 | 1.7 | 1.15 | 3.3 |
| 1953 | 136.9 | 0.79 | 5.8 | 5.7 | 0.03 | 2.4 | 0.29 | 0.30 | 3.6 | 7.5 | 0.16 | 1.5 | 1.28 | 3.6 |
| 1954 | 146.5 | 0.85 | 6.3 | 6.1 | 0.03 | 2.4 | 0.39 | 0.40 | 4.6 | 7.4 | 0.16 | 1.8 | 1.43 | 4.2 |
| 1955 | 159.5 | 0.92 | 6.4 | 6.0 | 0.03 | 2.1 | 0.43 | 0.45 | 4.8 | 5.9 | 0.12 | 1.2 | 1.53 | 4.1 |
| 1956 | 174.1 | 1.01 | 6.7 | 6.4 | 0.03 | 2.2 | 0.49 | 0.51 | 5.1 | 5.8 | 0.12 | 1.1 | 1.67 | 4.2 |
| 1957 | 189.4 | 1.10 | 7.2 | 6.6 | 0.03 | 2.2 | 0.62 | 0.64 | 6.1 | 5.7 | 0.12 | 1.1 | 1.89 | 4.7 |
| 1958 | 216.8 | 1.26 | 8.9 | 8.0 | 0.04 | 2.7 | 0.69 | 0.71 | 6.5 | 5.3 | 0.11 | 1.2 | 2.11 | 5.7 |
| 1959 | 258.2 | 1.50 | 10.0 | 9.5 | 0.04 | 3.0 | 0.83 | 0.86 | 7.2 | 4.9 | 0.10 | 1.1 | 2.50 | 6.4 |
| 1960 | 277.3 | 1.61 | 10.8 | 11.6 | 0.05 | 3.4 | 0.95 | 0.98 | 7.8 | 5.2 | 0.11 | 1.2 | 2.75 | 6.9 |
| 1961 | 297.3 | 1.72 | 11.3 | 13.5 | 0.06 | 3.7 | 1.03 | 1.06 | 8.1 | 5.2 | 0.11 | 1.2 | 2.95 | 7.3 |
| 1962 | 321.7 | 1.87 | 12.0 | 15.3 | 0.07 | 4.1 | 1.18 | 1.22 | 8.9 | 5.8 | 0.12 | 1.3 | 3.27 | 7.8 |
| 1963 | 342.8 | 1.99 | 12.5 | 16.0 | 0.07 | 4.0 | 1.37 | 1.41 | 9.7 | 5.4 | 0.11 | 1.1 | 3.58 | 8.1 |
| 1964 | 356.0 | 2.07 | 12.8 | 15.5 | 0.07 | 3.7 | 1.51 | 1.55 | 10.2 | 7.1 | 0.15 | 1.4 | 3.84 | 8.4 |
| 1965 | 378.6 | 2.20 | 13.3 | 14.3 | 0.06 | 3.2 | 1.56 | 1.61 | 10.2 | 8.2 | 0.17 | 1.6 | 4.04 | 8.5 |
| 1966 | 426.7 | 2.47 | 14.1 | 15.2 | 0.06 | 3.2 | 2.02 | 2.09 | 12.3 | 8.3 | 0.17 | 1.5 | 4.80 | 9.6 |
| 1967 | 472.6 | 2.74 | 14.7 | 20.1 | 0.09 | 3.9 | 2.41 | 2.48 | 13.8 | 9.5 | 0.20 | 1.7 | 5.51 | 10.5 |
| 1968 | 523.7 | 3.04 | 15.7 | 13.7 | 0.06 | 2.5 | 2.61 | 2.69 | 14.1 | 9.1 | 0.19 | 1.6 | 5.97 | 11.0 |
| 1969 | 563.8 | 3.27 | 16.7 | 19.9 | 0.08 | 3.4 | 3.05 | 3.14 | 15.4 | 10.1 | 0.21 | 1.8 | 6.70 | 11.9 |
| 1970 | 605.6 | 3.51 | 17.2 | 40.6 | 0.17 | 6.7 | 3.56 | 3.67 | 16.9 | 12.0 | 0.25 | 2.0 | 7.60 | 12.8 |
| 1971 | 648.9 | 3.76 | 18.8 | 54.0 | 0.22 | 8.7 | 3.95 | 4.08 | 18.3 | 17.3 | 0.36 | 3.1 | 8.42 | 14.5 |
| 1972 | 630.5 | 3.66 | 18.2 | 56.7 | 0.23 | 8.9 | 4.17 | 4.28 | 19.3 | 19.0 | 0.40 | 3.1 | 8.56 | 14.5 |
| 1973 | 604.3 | 3.51 | 18.0 | 54.9 | 0.22 | 8.7 | 4.37 | 4.46 | 20.1 | 24.2 | 0.51 | 4.1 | 8.70 | 14.9 |
| 1974 | 570.2 | 3.31 | 17.8 | 61.9 | 0.25 | 10.1 | 4.75 | 4.87 | 22.9 | 32.1 | 0.67 | 5.3 | 9.10 | 16.1 |
| 1975 | 531.5 | 3.08 | 17.4 | 59.7 | 0.24 | 10.0 | 4.57 | 4.67 | 23.8 | 43.6 | 0.92 | 6.7 | 8.90 | 16.3 |
| 1976 | 525.7 | 3.05 | 17.7 | 57.2 | 0.23 | 9.7 | 4.81 | 4.91 | 25.2 | 86.4 | 1.82 | 12.6 | 10.00 | 18.3 |
| 1977 | 535.0 | 3.10 | 17.8 | 57.4 | 0.23 | 9.7 | 4.94 | 5.04 | 25.8 | 74.8 | 1.57 | 10.7 | 9.94 | 18.0 |
| 1978 | 523.6 | 3.04 | 16.5 | 25.9 | 0.10 | 4.5 | 5.60 | 5.71 | 29.3 | 79.2 | 1.66 | 11.8 | 10.51 | 19.1 |
| 1979 | 519.8 | 3.01 | 16.7 | 11.9 | 0.05 | 2.1 | 5.93 | 6.05 | 30.1 | 84.9 | 1.78 | 10.9 | 10.89 | 18.8 |
| 1980 | 510.4 | 2.96 | 16.2 | 10.5 | 0.04 | 1.8 | 5.85 | 6.01 | 30.2 | 92.9 | 1.95 | 11.2 | 10.96 | 18.6 |
| 1981 | 529.3 | 3.07 | 16.9 | 12.3 | 0.05 | 2.1 | 6.15 | 6.31 | 32.1 | 138.8 | 2.91 | 16.8 | 12.35 | 21.1 |
| 1982 | 552.3 | 3.20 | 17.5 | 15.0 | 0.06 | 2.7 | 5.97 | 6.14 | 33.5 | 130.0 | 2.73 | 15.5 | 12.13 | 21.1 |
| 1983 | 568.8 | 3.30 | 17.9 | 14.0 | 0.05 | 2.5 | 5.17 | 5.33 | 32.1 | 124.3 | 2.61 | 15.9 | 11.30 | 20.8 |
| 1984 | 595.8 | 3.46 | 18.3 | 25.4 | 0.10 | 4.3 | 5.88 | 6.07 | 33.7 | 136.3 | 2.86 | 15.2 | 12.48 | 21.2 |
| 1985 | 628.3 | 3.64 | 19.2 | 26.6 | 0.10 | 4.5 | 5.24 | 5.41 | 31.8 | 184.6 | 3.88 | 20.9 | 13.03 | 22.6 |
| 1986 | 608.4 | 3.53 | 19.2 | 23.3 | 0.09 | 4.1 | 4.87 | 5.01 | 30.3 | 189.7 | 3.98 | 21.3 | 12.61 | 22.3 |
| 1987 | 577.3 | 3.35 | 18.9 | 23.7 | 0.09 | 4.1 | 5.56 | 5.73 | 33.4 | 195.2 | 4.10 | 21.2 | 13.27 | 23.2 |
| 1988 | 516.3 | 2.99 | 17.3 | 37.0 | 0.14 | 6.2 | 5.45 | 5.61 | 31.9 | 225.4 | 4.73 | 23.7 | 13.48 | 23.3 |
| 1989 | 488.9 | 2.84 | 17.6 | 45.1 | 0.17 | 8.0 | 5.32 | 5.49 | 30.7 | 236.3 | 4.96 | 24.1 | 13.46 | 23.4 |
| 1990 | 515.9 | 2.99 | 19.2 | 50.9 | 0.19 | 8.9 | 6.55 | 6.75 | 36.8 | 280.6 | 5.89 | 27.3 | 15.83 | 27.0 |
| 1991 | 491.0 | 2.85 | 18.1 | 72.7 | 0.28 | 12.0 | 5.99 | 6.17 | 33.8 | 285.1 | 5.99 | 28.6 | 15.28 | 26.4 |
| 1992 | 529.1 | 3.07 | 20.2 | 70.7 | 0.27 | 11.4 | 6.25 | 6.43 | 35.0 | 266.7 | 5.60 | 26.7 | 15.37 | 26.7 |
| 1993 | 529.3 | 3.07 | 21.2 | 64.4 | 0.24 | 10.2 | 6.56 | 6.74 | R36.3 | 285.7 | 6.00 | 30.2 | 16.05 | 28.7 |
| 1994 | 527.7 | 3.06 | 21.7 | 60.0 | 0.23 | 9.5 | 6.78 | 6.97 | 36.2 | 321.4 | 6.75 | 31.1 | 17.01 | 29.4 |

[1] Production from Naval Petroleum Reserve No. 1 (NPR#1) for 1974 and earlier years is for fiscal years (July through June).

[2] Includes only those quantities for which the royalties were paid on the basis of the value of the natural gas plant liquids produced. Additional quantities of natural gas plant liquids were produced; however, the royalties paid were based on the value of natural gas processed. These latter quantities are included with natural gas.

[3] Includes some quantities of natural gas processed into liquids at natural gas processing plants and fractionators.

[4] Converted to British thermal units (Btu) on the basis of an estimated heat content of coal produced on Federally administered lands of 21.0 million Btu per short ton.

[5] Based on physical units.

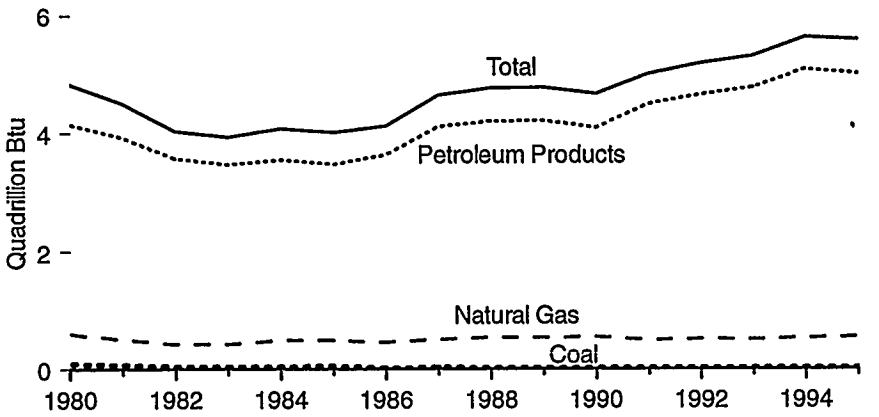
Note: Federally Administered Lands include all classes of land owned by the Federal Government, including acquired military, Outer Continental Shelf, and public lands.

R=Revised data.

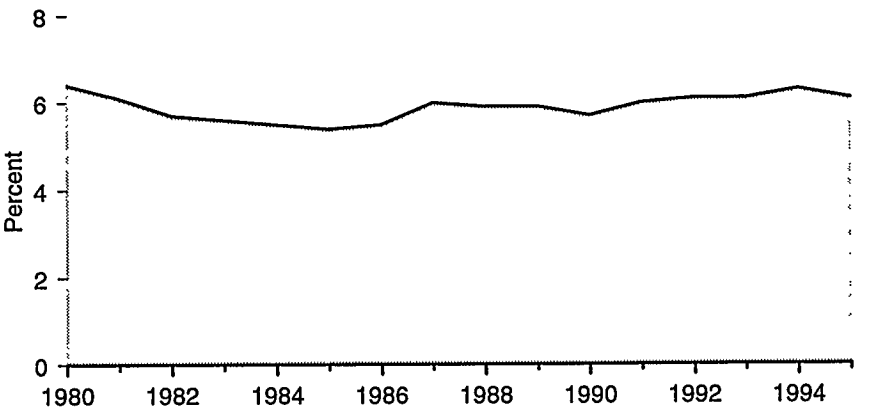
Source: See Note 2 at end of section.

# Figure 1.15 Fossil Fuel Consumption for Nonfuel Use

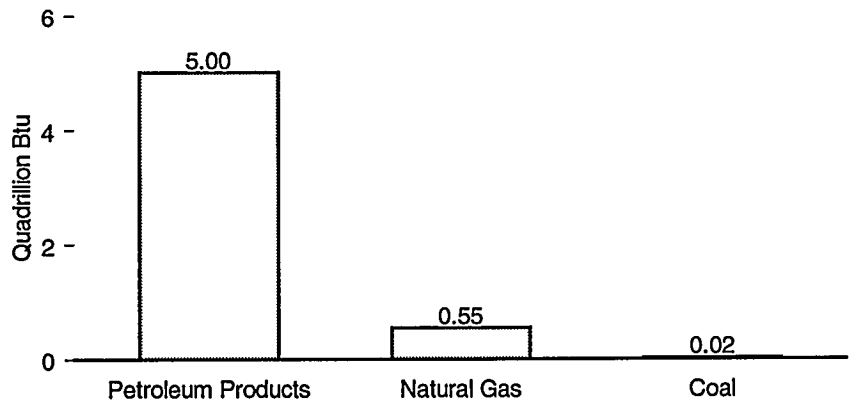
**Total, 1980-1995**



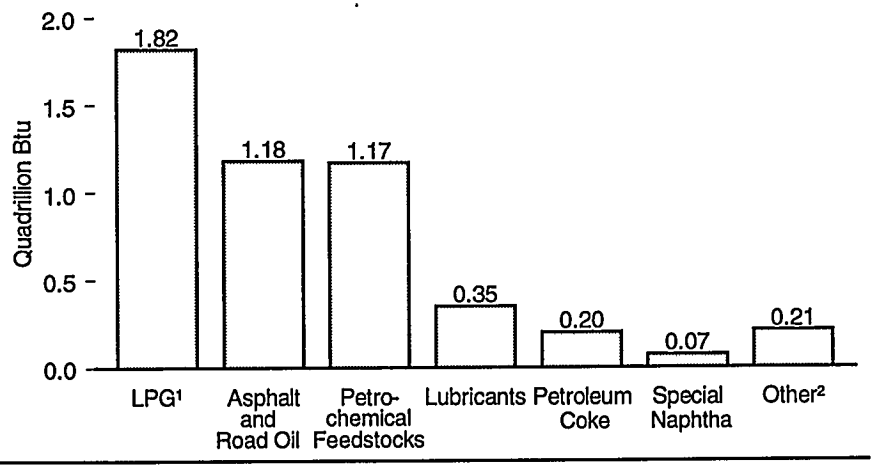

**As Share of Total Energy Consumption, 1980-1995**




**By Fuel, 1995**




**By Petroleum Product, 1995**




[1] Liquefied petroleum gases.
[2] "Other" is distillate fuel, residual fuel oil, waxes, and miscellaneous products.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 1.15.

# Table 1.15 Fossil Fuel Consumption for Nonfuel Use, 1980-1995

| Year | Petroleum Products | | | | | | | | Natural Gas | Coal | Total | Percent of Total Energy Consumption |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Asphalt and Road Oil | Liquefied Petroleum Gases | Lubricants | Petro-chemical Feedstocks | Petroleum Coke | Special Naphtha | Other [1] | Total | | | | |
| | Physical Units [2] | | | | | | | | | | | |
| 1980 | 145 | 231 | 58 | 253 | R8 | 37 | 58 | R790 | 589 | 2.6 | — | — |
| 1981 | 125 | 230 | 56 | 236 | R26 | 27 | 54 | R754 | 482 | 2.3 | — | — |
| 1982 | 125 | 259 | 51 | 169 | R20 | 25 | 48 | R697 | 415 | 1.5 | — | — |
| 1983 | 136 | 267 | 53 | 153 | R7 | 30 | 45 | R691 | 418 | 1.4 | — | — |
| 1984 | 149 | 260 | 57 | 144 | R14 | 40 | 38 | R702 | 471 | 1.6 | — | — |
| 1985 | 153 | 255 | 53 | 143 | R14 | 30 | 38 | R686 | 475 | 1.8 | — | — |
| 1986 | 164 | 268 | 47 | 180 | R13 | 24 | 41 | R737 | 444 | 0.8 | — | — |
| 1987 | 170 | 316 | 59 | 170 | R24 | 28 | 40 | R807 | 490 | 0.9 | — | — |
| 1988 | 171 | 340 | 56 | 174 | R25 | 22 | 45 | R833 | 526 | 0.8 | — | — |
| 1989 | 165 | 349 | 58 | 172 | R23 | 20 | 44 | R831 | 528 | 0.7 | — | — |
| 1990 | 164 | 362 | 60 | 153 | R32 | 20 | 40 | R831 | 533 | 0.8 | — | — |
| 1991 | 162 | 404 | 53 | 203 | R27 | 17 | 43 | R909 | 475 | 0.7 | — | — |
| 1992 | 166 | 411 | 54 | 214 | R42 | 20 | 35 | R942 | 503 | 0.8 | — | — |
| 1993 | 173 | 444 | 56 | 214 | R31 | 20 | 35 | R973 | 495 | 0.8 | — | — |
| 1994 | 176 | R493 | R58 | R224 | R33 | 15 | 37 | R1,036 | R517 | 0.8 | — | — |
| 1995 P | 177 | 498 | 57 | 207 | 33 | 13 | 36 | 1,021 | 532 | 0.8 | — | — |
| | Quadrillion Btu | | | | | | | | | | | |
| 1980 | 0.96 | 0.82 | 0.35 | 1.43 | 0.05 | 0.19 | 0.34 | 4.14 | 0.60 | 0.09 | 4.83 | 6.4 |
| 1981 | 0.83 | 0.81 | 0.34 | 1.33 | 0.16 | 0.14 | 0.32 | 3.93 | 0.50 | 0.07 | 4.50 | 6.1 |
| 1982 | 0.83 | 0.90 | 0.31 | 0.95 | 0.12 | 0.13 | 0.28 | 3.57 | 0.43 | 0.04 | 4.04 | 5.7 |
| 1983 | 0.90 | 0.93 | 0.32 | 0.86 | 0.04 | 0.16 | 0.26 | 3.47 | 0.43 | 0.04 | 3.94 | 5.6 |
| 1984 | 0.99 | 0.89 | 0.35 | 0.81 | 0.08 | 0.21 | 0.22 | 3.55 | 0.49 | 0.04 | 4.08 | 5.5 |
| 1985 | 1.02 | 0.86 | 0.32 | 0.81 | 0.08 | 0.16 | 0.22 | 3.47 | 0.49 | 0.05 | 4.01 | 5.4 |
| 1986 | 1.09 | 0.82 | 0.29 | 1.02 | 0.08 | 0.13 | 0.21 | 3.64 | 0.46 | 0.02 | 4.12 | 5.5 |
| 1987 | 1.13 | 1.12 | 0.35 | 1.00 | 0.14 | 0.14 | 0.23 | 4.11 | 0.50 | 0.03 | 4.64 | 6.0 |
| 1988 | 1.14 | 1.21 | 0.35 | 1.00 | 0.15 | 0.11 | 0.24 | 4.20 | 0.54 | 0.02 | 4.76 | 5.9 |
| 1989 | 1.10 | 1.26 | 0.35 | 1.00 | 0.14 | 0.11 | 0.25 | 4.21 | 0.54 | 0.02 | 4.77 | 5.9 |
| 1990 | 1.09 | 1.28 | 0.37 | 0.82 | 0.19 | 0.11 | 0.23 | 4.09 | 0.55 | 0.02 | 4.66 | 5.7 |
| 1991 | 1.08 | 1.42 | 0.33 | 1.15 | 0.16 | 0.09 | 0.26 | 4.49 | 0.49 | 0.02 | 5.00 | 6.0 |
| 1992 | 1.10 | 1.45 | 0.33 | 1.20 | 0.26 | 0.10 | 0.21 | 4.65 | 0.52 | 0.02 | 5.19 | 6.1 |
| 1993 | 1.15 | 1.60 | 0.34 | 1.21 | 0.18 | 0.10 | 0.20 | 4.78 | 0.51 | 0.02 | 5.31 | 6.1 |
| 1994 | 1.17 | R1.80 | 0.35 | R1.26 | R0.20 | 0.08 | 0.22 | R5.07 | R0.53 | 0.02 | R5.62 | R6.3 |
| 1995 P | 1.18 | 1.82 | 0.35 | 1.17 | 0.20 | 0.07 | 0.21 | 5.00 | 0.55 | 0.02 | 5.57 | 6.1 |

[1] "Other" is distillate fuel oil, residual fuel oil, waxes, and miscellaneous products.
[2] Petroleum - million barrels; natural gas - billion cubic feet; and coal - million short tons.
R=Revised data. P=Preliminary data. — = Not applicable.
Sources: **Petroleum Products:** • 1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual* and *Sales of Liquefied Petroleum Gases and Ethane in 1980.* • 1981-1985—EIA, *Petroleum Supply Annual* and unpublished data. • 1986 forward—EIA, *Petroleum Supply Monthly* and EIA estimates. **Natural Gas:** • 1980—Bureau of the Census, 1980 Survey of Manufactures, *Hydrocarbon, Coal, and Coke Materials Consumed.* • 1981 forward—U.S. Department of Commerce estimates. **Coal:** U.S. International Trade Commission, *Synthetic Organic Chemicals, United States Production and Sales, 1994* (January 1996). **Percent of Total Energy Consumption:** Derived by dividing total by total consumption on Table 1.3.

## Energy Overview Notes

1. Data on the generation of electricity in the United States represent net generation, which is gross output of electricity (measured at the generator terminals) minus power plant use. Nuclear electricity generation data identified by individual countries in Section 11 are gross outputs of electricity.

2. Table 1.14 Sources: **Coal:** 1949–1980—U.S. Geological Survey, *Coal*, Phosphate, Potash, Sodium, and Other Mineral Production, Royalty Income, and Related Statistics, June 1981. 1981 forward—U.S. Minerals Management Service, *Mineral Revenues–The 1992 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports.

**All Other Data:** 1949–1980—U.S. Geological Survey, *Oil and Gas Production,* Royalty Income, and Related Statistics, June 1981; Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data. 1981–1983—U.S. Minerals Management Service, *Mineral Revenues–The 1983 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports; Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data; and U.S. Geological Survey, National Petroleum Reserve in Alaska, unpublished data. 1984 forward—U.S. Minerals Management Service, *Mineral Revenues–The 1992 Report on Receipts from Federal and Indian Leases*, and predecessor annual reports; Department of Energy, Office of Naval Petroleum and Oil Shale Reserves, unpublished data.

# 2. End-Use Energy Consumption

**Types of Consumption Data**

The Energy Information Administration publishes two sets of statistics on end-use energy consumption. The first set, based on surveys directed to suppliers and marketers, provides continuous series for the years 1949 through 1995 and allocates U.S. total energy consumption to one of three end-use sectors: industrial, residential and commercial, or transportation. The second set, based on surveys directed to end-users of energy, provides detailed information on the types of energy consumed and the energy-related characteristics of manufacturing establishments, commercial buildings, households, and household vehicles.

## End-Use Energy Overview, 1949-1995

***Industrial.*** Energy consumption by the industrial sector increased throughout the 1960's and in 1973 reached 32 quadrillion Btu. Of the three end-use sectors, the industrial sector proved to be the most responsive to the turmoil in energy markets after the 1973-1974 embargo (2.1).* In 1979, industrial consumption of energy reached the then-record level of 33 quadrillion Btu. In the early 1980's, a stagnant economy restrained industrial consumption, which declined to a 16-year low of 26 quadrillion Btu in 1983. In 1988 and 1989, economic growth spurred demand for energy in the industrial sector, and industrial energy consumption in 1989 rose to 29 quadrillion Btu. Despite slow economic growth in the early 1990's, industrial energy consumption trended upward. In 1995, industrial consumption of energy reached 34 quadrillion Btu, the highest level recorded.

***Residential and commercial.*** Much of the growth in energy consumption during the 1949-through-1995 period occurred in the residential and commercial sector (2.1). Residential and commercial consumption leveled off in response to higher energy prices in the late 1970's and early 1980's, but lower prices in the 1986-through-1995 period played a role in boosting residential and commercial energy consumption to the record level of 32 quadrillion Btu in 1995.

***Transportation.*** Energy consumption by the transportation sector was primarily petroleum consumption. Over the 47-year period, the transportation sector's consumption of petroleum more than tripled, but growth was slower during the 1980's than in previous decades. In 1995, consumption of petroleum in the transportation sector totaled 24 quadrillion Btu, also a record level.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Consumption of Energy for Manufacturing in 1991

The U.S. manufacturing sector consumed an estimated 20 quadrillion Btu[1] of energy in 1991. Natural gas accounted for 6.1 quadrillion Btu, a 30-percent share of total energy consumption (2.2). Net electricity[2] accounted for 2.4 quadrillion Btu, a 12-percent share, and coal consumption accounted for 2.0 quadrillion Btu, a 10-percent share. Fuel oil consumption of 0.6 quadrillion Btu accounted for a 3.0-percent share.

Of all the industries, the petroleum and coal products industry was the largest user of energy in 1991, consuming 6.0 quadrillion Btu. At 5.1 quadrillion Btu, the chemicals and allied products industry was the second largest user. Together, the two industries accounted for more than half of the energy consumed in the manufacturing sector.

Because the manufacturing sector accounts for a large share of total U.S. energy consumption, manufacturers' ability to cope with fluctuations in energy supplies and prices by switching to alternative sources of energy plays a significant role in the Nation's energy security. Fuel

[1]The manufacturing sector is composed of establishments that use mechanical or chemical processes to transform raw materials into intermediate or final products. It does not include the remainder of the industrial sector (construction, mining, agricultural, fishing, and forestry establishments) or electric utilities. The 20 quadrillion Btu total is the *primary consumption of energy*; it includes energy consumed to produce heat and power and to generate electricity, as well as sources of energy consumed as petrochemical feedstocks and raw material inputs, but it excludes byproduct fuels produced from other energy sources.

[2]Net electricity is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

switching to alternative sources of energy plays a significant role in the Nation's energy security. Fuel switiching capability[3] in 1991 was determined for five major energy sources: natural gas, purchased electricity, coal, residual fuel oil, and distillate fuel oil (2.3).

Residual fuel oil registered the largest value (45 percent) for switchable consumption as a percentage of actual consumption, indicating substantial fuel-switching capabilities. In addition, 20 percent of distillate fuel oil consumption could have been supplied by other sources. It is estimated that about 99 thousand barrels per day of fuel oil (residual and distillate combined) consumed could have been switched to nonpetroleum sources.

Natural gas registered the largest absolute amount of total switchable consumption. Of the 5.5 quadrillion Btu total of natural gas consumption, 1.9 quadrillion Btu (35 percent) could have been switched to other sources. Of the 1.2 quadrillion Btu of coal consumed, 0.5 quadrillion Btu (45 percent) were switchable. Very little (less than 3 percent) of the 2.5 quadrillion Btu of purchased electricity consumed by manufacturers in 1991 could have been switched to other sources if manufacturing output were to be maintained.

## Household Uses of Energy in 1993

In 1993, household energy consumption totaled 10 quadrillion Btu and energy consumption per household averaged 104 million Btu (2.9). Household energy consumption is strongly influenced by climate. Households in the West and South consumed the least amount of energy in 1993, an average of 76 million Btu per household in the West and 88 million Btu per household in the South. Consumption in the colder climates was higher in 1993; households in the Midwest averaged 134 million Btu per household and those in the Northeast 122 million Btu per household. Many other factors influence consumption, including the fact that houses in the Northeast and Midwest tend to be larger and older.

Energy consumed by households can be attributed to four primary applications: space heating, air conditioning, water heating, and appliance operation (2.10). In 1993, space heating was the most prevalent application of energy consumed by households and accounted for 5.3 quadrillion Btu. Natural gas was the primary source of energy for space heating and provided the main source of heat in 51 million households (2.11). Natural gas was also the primary source of energy for water heating (2.10).

[3]The capability of U.S. manufacturers to switch fuels within 30 days, using only existing equipment and keeping production output constant.

***Natural gas was the primary source of energy for space heating and provided the main source of heat in 51 million households in 1993.***

About 2.4 quadrillion Btu were used to operate appliances and, as would be expected, electricity was the major source of energy for that application. Refrigerators, color television sets, ovens (regular and microwave), and clothes washers were the most common household appliances (2.12).

Electricity was essentially the only source of energy used for air conditioning. Although air conditioning accounted for only 4.6 percent of household energy consumption, it accounted for 9.1 percent ($11.3 billion) of total household energy expenditures of $124 billion (2.10).

The cost of energy used to operate appliances totaled $56 billion in 1993, and the cost for space heating was $40 billion. Energy expenses for water heating came to about $17 billion.

## Improvements in Passenger Car Efficiency, 1973–1994

Because motor gasoline consistently accounts for the largest share of all petroleum products supplied (5.11), motor gasoline consumption has a significant effect on U.S. dependence on foreign sources of crude oil. Following the oil embargo in the mid-1970's, concerns about U.S. dependence on foreign oil led to interest in improving motor vehicle efficiency.

In 1973, average annual mileage exceeded 10 thousand miles per passenger car (2.15). The average fuel rate of passenger cars, which make up a sizable proportion of the U.S. motor vehicle fleet, was 13 miles per gallon. That measure of fuel efficiency had declined for the previous several years.

In 1973 and 1974, however, crude oil supply interruptions and rising prices led to public concern over the continued availability of motor gasoline. The immediate effect of higher prices was a decline in mileage to an average of 9.6 thousand miles per passenger car in 1974 (2.15). At the same time, the average fuel rate of the passenger car fleet began to improve. It increased throughout the 1970's and 1980's, peaking at an average of 21.7 miles per gallon in 1991. In 1994, the fuel rate was 21.5 miles per gallon. The Federal Corporate Average Fuel Economy standards, which required automobile manufacturers to meet fleet fuel-rate minimum averages, played a major role in the increase in fuel rates.

## Energy Consumption by Household Vehicles in 1994

In spite of the recent rapid growth in the number of minivans and sport-utility vehicles owned by U.S. households, the average on-road fuel efficiency of the household vehicle fleet rose from 15 miles per gallon in 1983 to 20 miles per gallon in 1994 (2.14). In 1994, nearly 85 million households owned or had access to at least one vehicle. The 157 million household vehicles traveled a total of 1.8 trillion miles, up from 1.2 trillion miles in 1983.

In 1994, household vehicles consumed 87 billion gallons of unleaded motor gasoline and a quantity of leaded motor gasoline too small to be accurately measured. Consumption in 1991 was 81 billion gallons, of which 96 percent was unleaded. In 1983, by comparison, 59 percent of the 79 billion gallons consumed was unleaded. The average price of motor gasoline was slightly lower in 1994 than in 1983. According to household survey data, unleaded motor gasoline averaged $1.16 per gallon in 1994, down from $1.22 per gallon in 1983.

## Energy-Related Characteristics of Commercial Buildings in 1992

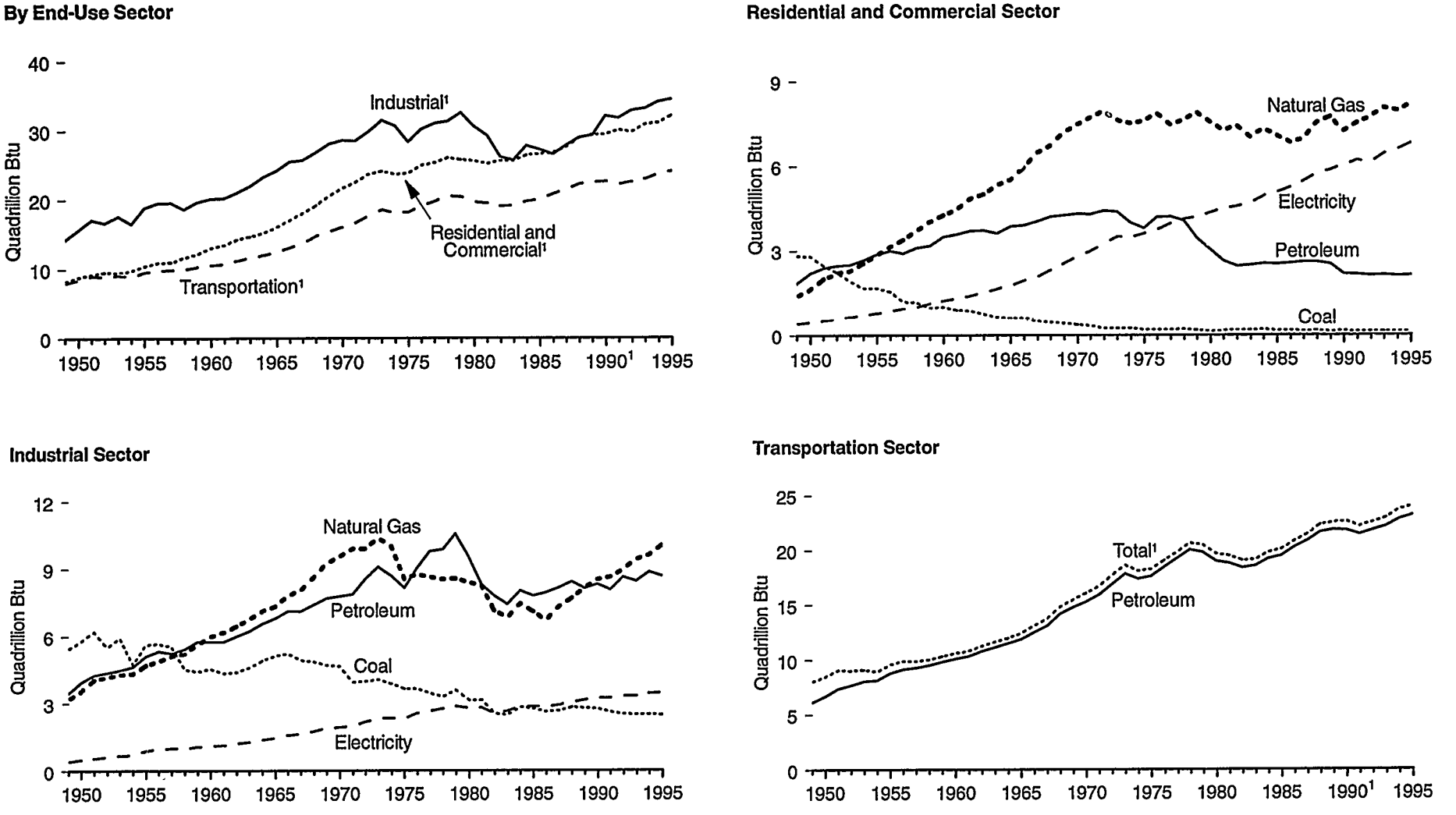
Commercial buildings are those which house mercantile, service, office, education, and other activities. In 1992, there were approximately 68 billion square feet of commercial floorspace in the United States (2.17). The largest amount of commercial floorspace, 25 billion square feet, was found in the South and accounted for 36 percent of the U.S. total. On the basis of the amount of commercial floorspace in which a given energy source is consumed, electricity was the most prevalent. Electricity was an energy source for almost 67 billion square feet of commercial floorspace. Natural gas was also commonly used and supplied energy for 45 billion square feet. Fuel oil, district heat,[4] and propane were consumed in smaller, but still significant, amounts in commercial buildings.

On a Btu basis, electricity and natural gas were the most common sources of energy in commercial buildings (2.20). In 1992, 2.6 quadrillion Btu of electricity and 2.2 quadrillion Btu of natural gas were consumed in commercial buildings. Consumption of district heat totaled 0.4 quadrillion Btu and consumption of fuel oil totaled 0.3 quadrillion Btu. (Propane also supplied small amounts of energy in commercial buildings, but propane data were not collected in 1992.)

Of the $72 billion spent on energy for commercial buildings in 1992, by far the largest amount went for electricity (2.20). Electricity expenditures came to $58 billion, whereas expenditures for natural gas came to $9.9 billion. Expenditures for district heat were $2.9 billion and expenditures for fuel oil were $1.4 billion.

[4]District heat is steam or hot water that circulates from a central plant or utility.

# Figure 2.1 Energy Consumption by End-Use Sector, 1949-1995




[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 2.1.

# Table 2.1 Energy Consumption by End-Use Sector, 1949-1995

(Quadrillion Btu)

| | Residential and Commercial | | | | | | Industrial | | | | | | Transportation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Coal | Natural Gas [1] | Petroleum | Electricity | Losses [2] | Total [3] | Coal | Natural Gas [1] | Petroleum | Electricity | Losses [2] | Total [3,4] | Petroleum | Total [3,5] | Total [3] |
| 1949 | 2.83 | 1.39 | 1.85 | 0.43 | 1.72 | 8.21 | 5.43 | 3.19 | 3.47 | 0.42 | 1.68 | 14.26 | 6.15 | 7.99 | 30.46 |
| 1950 | 2.80 | 1.64 | 2.20 | 0.47 | 1.76 | 8.87 | 5.78 | 3.55 | 3.95 | 0.50 | 1.86 | 15.71 | 6.69 | 8.49 | 33.08 |
| 1951 | 2.47 | 2.01 | 2.40 | 0.54 | 1.89 | 9.30 | 6.20 | 4.05 | 4.27 | 0.57 | 2.00 | 17.13 | 7.36 | 9.04 | 35.47 |
| 1952 | 2.25 | 2.21 | 2.46 | 0.59 | 2.02 | 9.54 | 5.52 | 4.18 | 4.36 | 0.60 | 2.05 | 16.76 | 7.71 | 9.00 | 35.30 |
| 1953 | 1.93 | 2.29 | 2.50 | 0.65 | 2.12 | 9.50 | 5.93 | 4.30 | 4.48 | 0.68 | 2.20 | 17.65 | 8.06 | 9.12 | 36.27 |
| 1954 | 1.68 | 2.57 | 2.67 | 0.72 | 2.15 | 9.78 | 4.73 | 4.32 | 4.63 | 0.71 | 2.14 | 16.58 | 8.12 | 8.90 | 35.27 |
| 1955 | 1.67 | 2.85 | 2.87 | 0.79 | 2.23 | 10.41 | 5.62 | 4.70 | 5.11 | 0.89 | 2.51 | 18.86 | 8.80 | 9.55 | 38.82 |
| 1956 | 1.55 | 3.15 | 3.00 | 0.87 | 2.39 | 10.96 | 5.67 | 4.87 | 5.34 | 0.98 | 2.68 | 19.55 | 9.15 | 9.86 | 40.38 |
| 1957 | 1.19 | 3.39 | 2.91 | 0.95 | 2.55 | 10.98 | 5.54 | 5.11 | 5.24 | 1.00 | 2.70 | 19.60 | 9.29 | 9.90 | 40.48 |
| 1958 | 1.16 | 3.71 | 3.12 | 1.01 | 2.64 | 11.65 | 4.53 | 5.21 | 5.41 | 0.98 | 2.54 | 18.70 | 9.51 | 10.00 | 40.35 |
| 1959 | 0.99 | 4.02 | 3.18 | 1.12 | 2.84 | 12.15 | 4.41 | 5.65 | 5.74 | 1.08 | 2.73 | 19.64 | 9.85 | 10.35 | 42.14 |
| 1960 | 0.99 | 4.27 | 3.49 | 1.23 | 3.06 | 13.04 | 4.54 | 5.97 | 5.75 | 1.11 | 2.76 | 20.16 | 10.13 | 10.60 | 43.80 |
| 1961 | 0.90 | 4.48 | 3.58 | 1.30 | 3.18 | 13.44 | 4.35 | 6.17 | 5.75 | 1.15 | 2.80 | 20.25 | 10.32 | 10.77 | 44.46 |
| 1962 | 0.88 | 4.85 | 3.72 | 1.41 | 3.40 | 14.27 | 4.38 | 6.45 | 6.00 | 1.23 | 2.95 | 21.04 | 10.77 | 11.23 | 46.53 |
| 1963 | 0.76 | 5.01 | 3.72 | 1.54 | 3.68 | 14.71 | 4.59 | 6.75 | 6.23 | 1.29 | 3.08 | 21.95 | 11.17 | 11.66 | 48.32 |
| 1964 | 0.65 | 5.33 | 3.62 | 1.67 | 3.96 | 15.23 | 4.91 | 7.11 | 6.55 | 1.38 | 3.29 | 23.27 | 11.50 | 12.00 | 50.50 |
| 1965 | 0.62 | 5.52 | 3.87 | 1.78 | 4.25 | 16.03 | 5.13 | 7.34 | 6.79 | 1.46 | 3.49 | 24.22 | 11.87 | 12.43 | 52.68 |
| 1966 | 0.61 | 5.95 | 3.91 | 1.94 | 4.65 | 17.06 | 5.21 | 7.80 | 7.11 | 1.58 | 3.79 | 25.50 | 12.50 | 13.10 | 55.66 |
| 1967 | 0.52 | 6.47 | 4.04 | 2.09 | 4.98 | 18.10 | 4.93 | 8.04 | 7.12 | 1.65 | 3.95 | 25.72 | 13.11 | 13.75 | 57.57 |
| 1968 | 0.47 | 6.73 | 4.20 | 2.32 | 5.52 | 19.23 | 4.85 | 8.63 | 7.39 | 1.78 | 4.24 | 26.90 | 14.21 | 14.86 | 61.00 |
| 1969 | 0.44 | 7.20 | 4.26 | 2.57 | 6.12 | 20.59 | 4.71 | 9.23 | 7.70 | 1.91 | 4.56 | 28.10 | 14.81 | 15.50 | 64.19 |
| 1970 | 0.37 | 7.46 | 4.31 | 2.79 | 6.78 | 21.71 | 4.66 | 9.54 | 7.79 | 1.95 | 4.72 | 28.63 | 15.31 | 16.09 | 66.43 |
| 1971 | 0.35 | 7.71 | 4.29 | 2.99 | 7.25 | 22.59 | 3.94 | 9.89 | 7.86 | 2.01 | 4.87 | 28.57 | 15.92 | 16.72 | 67.89 |
| 1972 | 0.27 | 7.94 | 4.43 | 3.25 | 7.80 | 23.69 | 3.99 | 9.88 | 8.53 | 2.19 | 5.25 | 29.86 | 16.89 | 17.71 | 71.26 |
| 1973 | 0.25 | 7.63 | 4.39 | 3.50 | 8.38 | 24.14 | 4.06 | 10.39 | 9.10 | 2.34 | 5.61 | 31.53 | 17.83 | 18.60 | 74.28 |
| 1974 | 0.26 | 7.52 | 4.00 | 3.47 | 8.48 | 23.72 | 3.87 | 10.00 | 8.69 | 2.34 | 5.70 | 30.70 | 17.40 | 18.12 | 72.54 |
| 1975 | 0.21 | 7.58 | 3.80 | 3.60 | 8.70 | 23.90 | 3.67 | 8.53 | 8.15 | 2.35 | 5.66 | 28.40 | 17.62 | 18.25 | 70.55 |
| 1976 | 0.20 | 7.87 | 4.18 | 3.75 | 9.02 | 25.02 | 3.66 | 8.76 | 9.01 | 2.57 | 6.20 | 30.24 | 18.51 | 19.10 | 74.36 |
| 1977 | 0.21 | 7.46 | 4.21 | 3.96 | 9.56 | 25.39 | 3.45 | 8.64 | 9.78 | 2.68 | 6.48 | 31.08 | 19.24 | 19.82 | 76.29 |
| 1978 | 0.21 | 7.62 | 4.07 | 4.12 | 10.07 | 26.09 | 3.31 | 8.54 | 9.87 | 2.76 | 6.75 | 31.39 | 20.04 | 20.61 | 78.09 |
| 1979 | 0.19 | 7.89 | 3.45 | 4.18 | 10.10 | 25.81 | 3.59 | 8.55 | 10.57 | 2.87 | 6.94 | 32.61 | 19.82 | 20.47 | 78.90 |
| 1980 | 0.15 | 7.54 | 3.04 | 4.35 | 10.58 | 25.65 | 3.16 | 8.39 | 9.53 | 2.78 | 6.76 | 30.61 | 19.01 | 19.69 | 75.96 |
| 1981 | 0.17 | 7.24 | 2.63 | 4.50 | 10.70 | 25.24 | 3.16 | 8.26 | 8.29 | 2.82 | 6.70 | 29.24 | 18.81 | 19.51 | 73.99 |
| 1982 | 0.19 | 7.43 | 2.45 | 4.57 | 11.00 | 25.63 | 2.55 | 7.12 | 7.80 | 2.54 | 6.12 | 26.14 | 18.42 | 19.07 | 70.85 |
| 1983 | 0.19 | 7.02 | 2.50 | 4.68 | 11.24 | 25.63 | 2.49 | 6.83 | 7.42 | 2.65 | 6.36 | 25.75 | 18.59 | 19.13 | 70.52 |
| 1984 | 0.21 | 7.29 | 2.54 | 4.93 | 11.51 | 26.48 | 2.84 | 7.45 | 8.01 | 2.86 | 6.68 | 27.86 | 19.22 | 19.80 | 74.14 |
| 1985 | 0.18 | 7.08 | 2.52 | 5.06 | 11.87 | 26.70 | 2.76 | 7.08 | 7.81 | 2.86 | 6.69 | 27.22 | 19.50 | 20.07 | 73.98 |
| 1986 | 0.18 | 6.82 | 2.56 | 5.24 | 12.06 | 26.85 | 2.64 | 6.69 | 7.92 | 2.83 | 6.53 | 26.63 | 20.27 | 20.81 | 74.30 |
| 1987 | 0.16 | 6.95 | 2.59 | 5.44 | 12.48 | 27.62 | 2.67 | 7.32 | 8.15 | 2.93 | 6.71 | 27.83 | 20.87 | 21.45 | 76.89 |
| 1988 | 0.17 | 7.51 | 2.60 | 5.72 | 12.92 | 28.92 | 2.83 | 7.70 | 8.43 | 3.06 | 6.90 | 28.99 | 21.63 | 22.30 | 80.22 |
| 1989 | 0.15 | 7.73 | 2.53 | 5.86 | 13.14 | 29.40 | 2.79 | 8.13 | 8.13 | 3.16 | 7.08 | 29.35 | 21.87 | 22.56 | 81.33 |
| 1990 | 0.16 | 7.22 | 2.17 | 6.02 | 13.22 | [6]29.43 | 2.76 | 8.50 | 8.32 | 3.23 | 7.09 | [R,6]32.10 | 21.81 | [6]22.62 | [R,6]84.17 |
| 1991 | 0.14 | 7.51 | 2.15 | 6.18 | 13.44 | 30.10 | 2.60 | 8.62 | 8.06 | 3.23 | 7.02 | [R]31.76 | 21.46 | 22.19 | [R]84.05 |
| 1992 | 0.14 | 7.73 | 2.13 | 6.10 | 13.01 | 29.80 | 2.51 | 8.97 | 8.64 | 3.32 | 7.08 | [R]32.90 | 21.81 | 22.54 | [R]85.26 |
| 1993 | 0.14 | 8.04 | 2.14 | 6.42 | 13.49 | [R]30.88 | 2.50 | [R]9.41 | 8.45 | 3.33 | 7.01 | [R]33.17 | 22.20 | 22.97 | [R]87.03 |
| 1994 | [R]0.14 | [R]7.97 | [R]2.09 | 6.56 | [R]13.67 | [R]31.07 | [R]2.51 | [R]9.61 | [R]8.85 | [R]3.44 | [R]7.17 | [R]34.14 | [R]22.83 | [R]23.67 | [R]88.90 |
| 1995[P] | 0.13 | 8.17 | 2.12 | 6.79 | 14.15 | 32.07 | 2.48 | 10.03 | 8.67 | 3.45 | 7.19 | 34.47 | 23.18 | 24.06 | 90.62 |

[1] Includes supplemental natural gas.

[2] Electrical system energy losses. See Glossary and Diagram 5. Total losses are calculated as the sum of energy consumed at electric utilities to generate electricity, utility purchases of electricity from nonutility power producers, and imported electricity, minus exported electricity and electricity consumed by end users. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity use.

[3] Beginning in 1990, includes renewable energy. See Table 10.1b.

[4] Also includes hydroelectric power and net imports of coal coke.

[5] Also includes coal, natural gas, electricity, and electrical system energy losses.

[6] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990. See Table 10.1b for quantities.

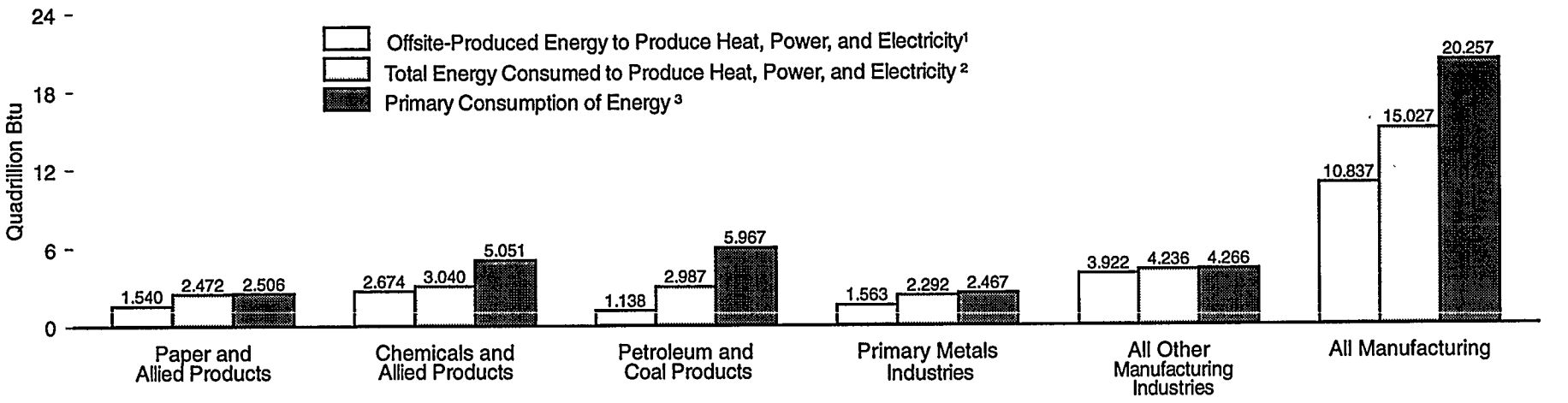
R=Revised data. P=Preliminary data.

Note: Totals may not equal sum of components due to independent rounding.

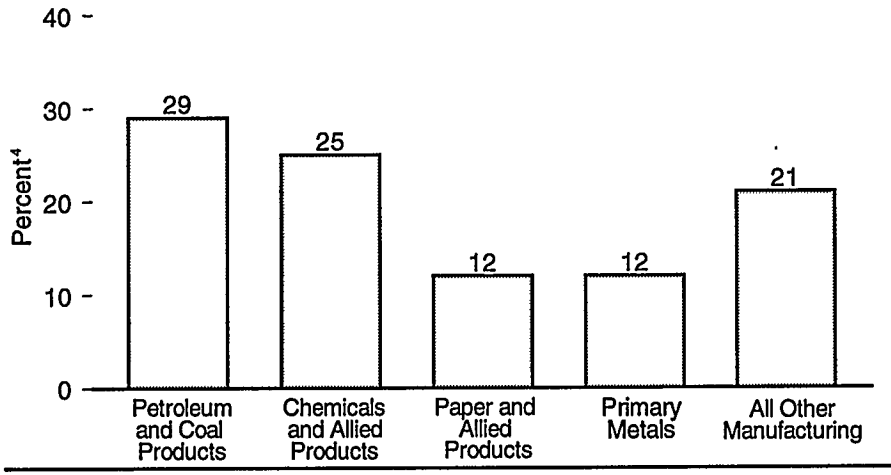
Sources: Tables 5.12a, 5.12b, 6.6, 7.3, 7.7, 8.1, 8.4, 8.6, 10.8, A3-A7, and Energy Information Administration estimates for industrial hydroelectric power. "Other" from Table 8.6 is allocated to the Residential and Commercial Sector, except for approximately 4 percent used by railroads and railways and attributed to the Transportation Sector.

## Figure 2.2 Manufacturing Energy Consumption Measures, 1991

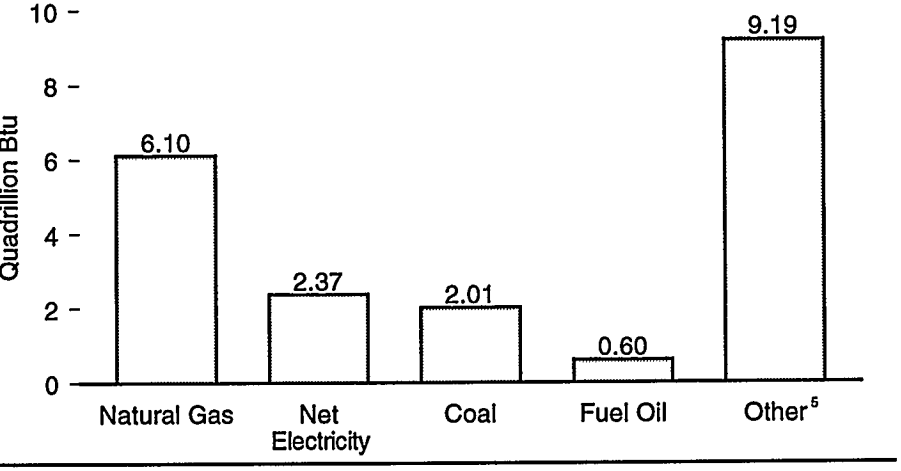
### By Industry and Type of Consumption




### Primary Energy Consumption by Industry




### Primary Energy Consumption by Source




[1] Energy that was produced offsite and then acquired by purchase or transfer and consumed onsite for the production of heat or power.

[2] Includes by-product energy.

[3] Includes feedstocks; does not include by-product fuels.

[4] Totals may not equal sum of components due to independent rounding.

[5] "Other" includes all other types of energy that respondents indicated were consumed; included are feedstocks and raw materials for nonenergy products, such as asphalt.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 2.2.

# Table 2.2 Manufacturing Energy Consumption Measures, 1991

(Quadrillion Btu, Except as Noted)

| Type of Consumption and Selected Industries | Net Electricity[1] | Fuel Oil | Natural Gas | Coal | Other[2] | Total | Percent |
|---|---|---|---|---|---|---|---|
| **Primary Consumption of Energy[3]** | **2.370** | **0.600** | **6.095** | **2.006** | **9.186** | **20.257** | **100** |
| Paper and Allied Products | 0.201 | 0.165 | W | 0.296 | W | 2.506 | 12 |
| Chemicals and Allied Products | 0.440 | W | 2.227 | W | W | 5.051 | 25 |
| Petroleum and Coal Products[4] | 0.105 | 0.086 | 0.838 | W | W | 5.967 | 29 |
| Primary Metal Industries | 0.499 | W | 0.708 | 0.853 | W | 2.467 | 12 |
| All Other Manufacturing Industries | 1.125 | W | W | W | W | 4.266 | 21 |
| **Total Energy Consumed to Produce Heat, Power, and Electricity[5]** | **2.370** | **0.553** | **5.506** | **1.184** | **5.414** | **15.027** | **100** |
| Paper and Allied Products | 0.201 | 0.165 | 0.548 | 0.296 | 1.262 | 2.472 | 16 |
| Chemicals and Allied Products | 0.440 | 0.060 | 1.669 | 0.253 | 0.618 | 3.040 | 20 |
| Petroleum and Coal Products | 0.105 | 0.108 | 0.838 | W | W | 2.987 | 20 |
| Primary Metal Industries | 0.499 | 0.044 | 0.686 | 0.046 | 1.017 | 2.292 | 15 |
| All Other Manufacturing Industries | 1.125 | 0.176 | 1.765 | W | W | 4.236 | 28 |
| **Offsite-Produced Energy Consumed to Produce Heat, Power, and Electricity[6]** | **2.451** | **0.485** | **5.492** | **1.175** | **1.234** | **10.837** | **100** |
| Paper and Allied Products | 0.222 | 0.165 | 0.548 | 0.292 | 0.313 | 1.540 | 14 |
| Chemicals and Allied Products | 0.474 | 0.059 | 1.665 | 0.249 | 0.227 | 2.674 | 25 |
| Petroleum and Coal Products | 0.114 | 0.041 | 0.830 | W | W | 1.138 | 11 |
| Primary Metal Industries | 0.502 | 0.044 | 0.686 | 0.046 | 0.285 | 1.563 | 14 |
| All Other Manufacturing Industries | 1.139 | 0.176 | 1.763 | W | W | 3.922 | 36 |

[1] "Net electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantities sold and transferred out. It excludes electricity generated from combustible fuels.

[2] Includes all other types of energy that respondents indicated were consumed.

[3] Includes feedstocks; does not include by-product fuels.

[4] Includes feedstocks and raw materials for the production of nonenergy products, regardless of the type of energy.

[5] Includes by-product energy.

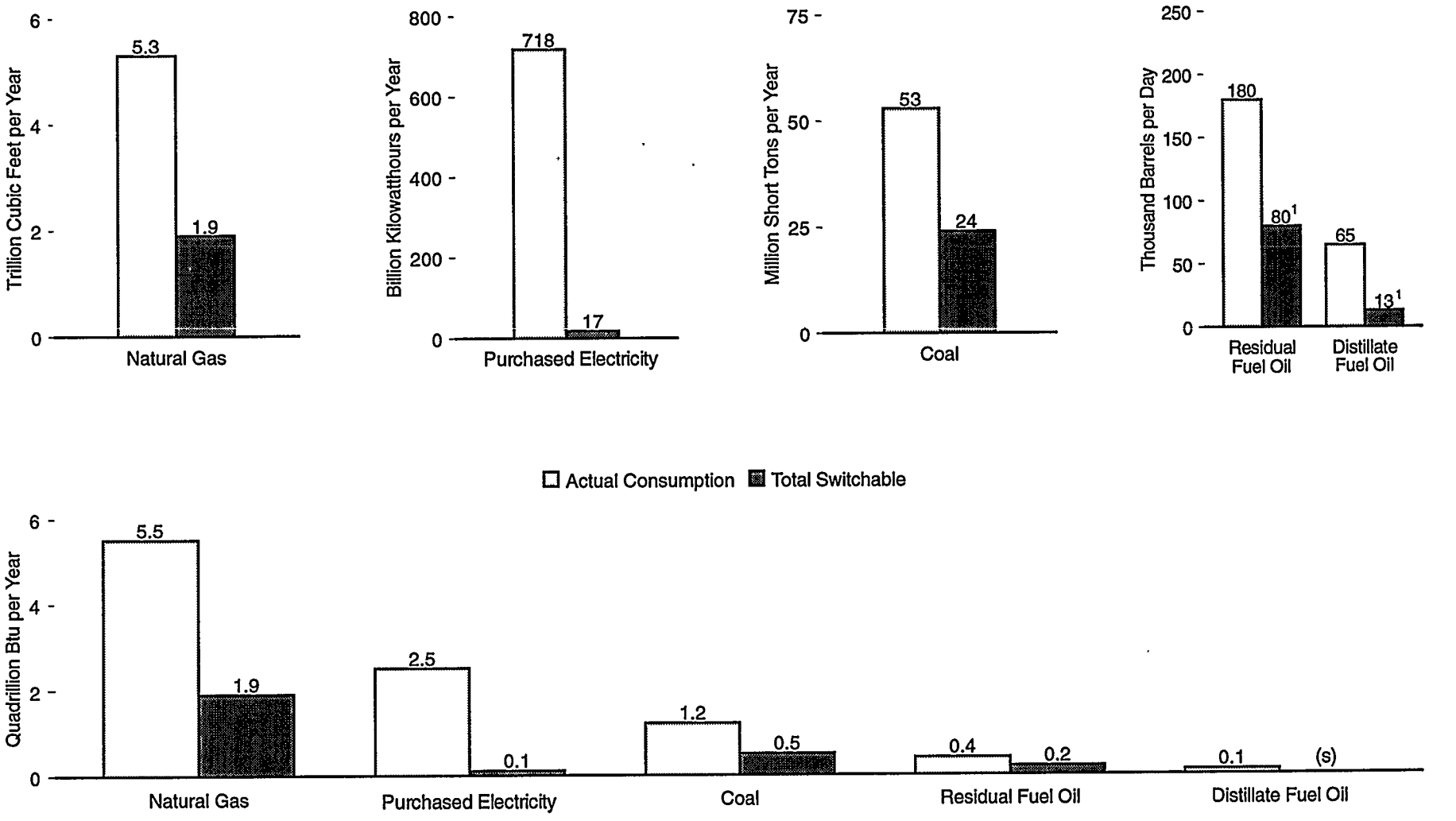
[6] Energy that was produced offsite and then acquired by purchase or transfer and consumed onsite for the production of heat or power.

W=Withheld to avoid disclosing data for individual establishments. Data are included in higher level totals.

Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, *Manufacturing Consumption of Energy 1991* (December 1994).

## Figure 2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991




[1] The quantity of residual and distillate fuel oils that is switchable to nonpetroleum alternative fuels is 99 thousand barrels per day, if all possible switching from nonpetroleum fuels took place.

(s)=Less than 0.05 quadrillion Btu.
Source: Table 2.3.

# Table 2.3 Manufacturing Fuel-Switching Capability Within 30 Days, 1991

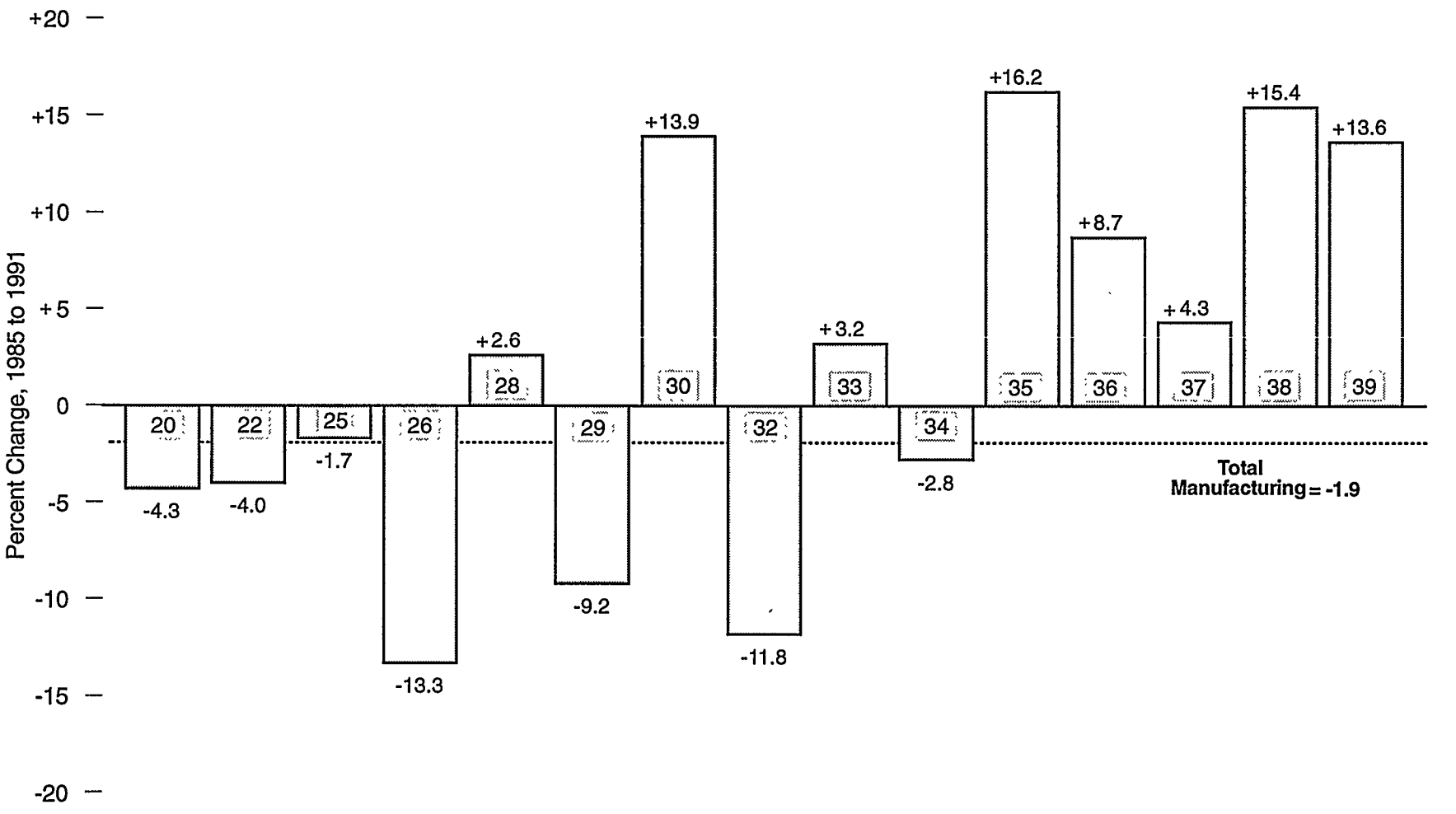
| Measure of Consumption | Natural Gas | | Purchased Electricity [1] | | Coal | | Residual Fuel Oil | | Distillate Fuel Oil | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Billion Cubic Feet per Year | Quadrillion Btu per Year | Million Kilowatt-hours per Year | Quadrillion Btu per Year | Thousand Short Tons per Year | Quadrillion Btu per Year | Thousand Barrels per Day | Quadrillion Btu per Year | Thousand Barrels per Day | Quadrillion Btu per Year |
| Actual | 5,345 | 5.505 | 718,480 | 2.451 | 53,035 | 1.181 | 180 | 0.414 | 65 | 0.139 |
| Minimum [2] | 3,485 | 3.590 | 701,478 | 2.393 | 29,425 | 0.655 | 100 | 0.229 | 52 | 0.111 |
| Maximum [3] | 5,887 | 6.064 | 766,887 | 2.617 | 58,996 | 1.314 | 553 | 1.269 | 551 | 1.171 |
| Total Switchable [4] | 1,860 | 1.916 | 17,003 | 0.058 | 23,610 | 0.526 | [5] 80 | 0.185 | [5] 13 | 0.028 |

[1] Those quantities for which payment was made and that were available onsite for consumption.
[2] The amount of fuel actually consumed, minus the amount actually consumed that could have been replaced by other fuels.
[3] The amount of fuel actually consumed, plus the amount of additional fuels consumed that could have occurred if all possible switching from other fuels took place.
[4] The amount of fuels actually consumed that could have been replaced by other fuels.
[5] The quantity of residual fuel oil and distillate fuel oil that is switchable to nonpetroleum alternative fuels is 99 thousand barrels per day, if all possible switching from nonpetroleum fuels took place.

Note: Consumption includes energy consumed for heat, power, and onsite electricity generation. It excludes energy consumed as petrochemical feedstocks and raw material inputs.

Source: Energy Information Administration, *Manufacturing Consumption of Energy 1991* (December 1994).

## Figure 2.4 Manufacturing Offsite Energy Intensity Change by Industry Group, 1985 to 1991




Notes: • Numbers that appear within each bar are the Standard Industrial Classification (SIC) codes for industry groups. See Table 2.4 for industry group titles. • A decrease in the energy intensity ratio implies an increase in energy efficiency and is represented by a positive value.
Source: Table 2.4.

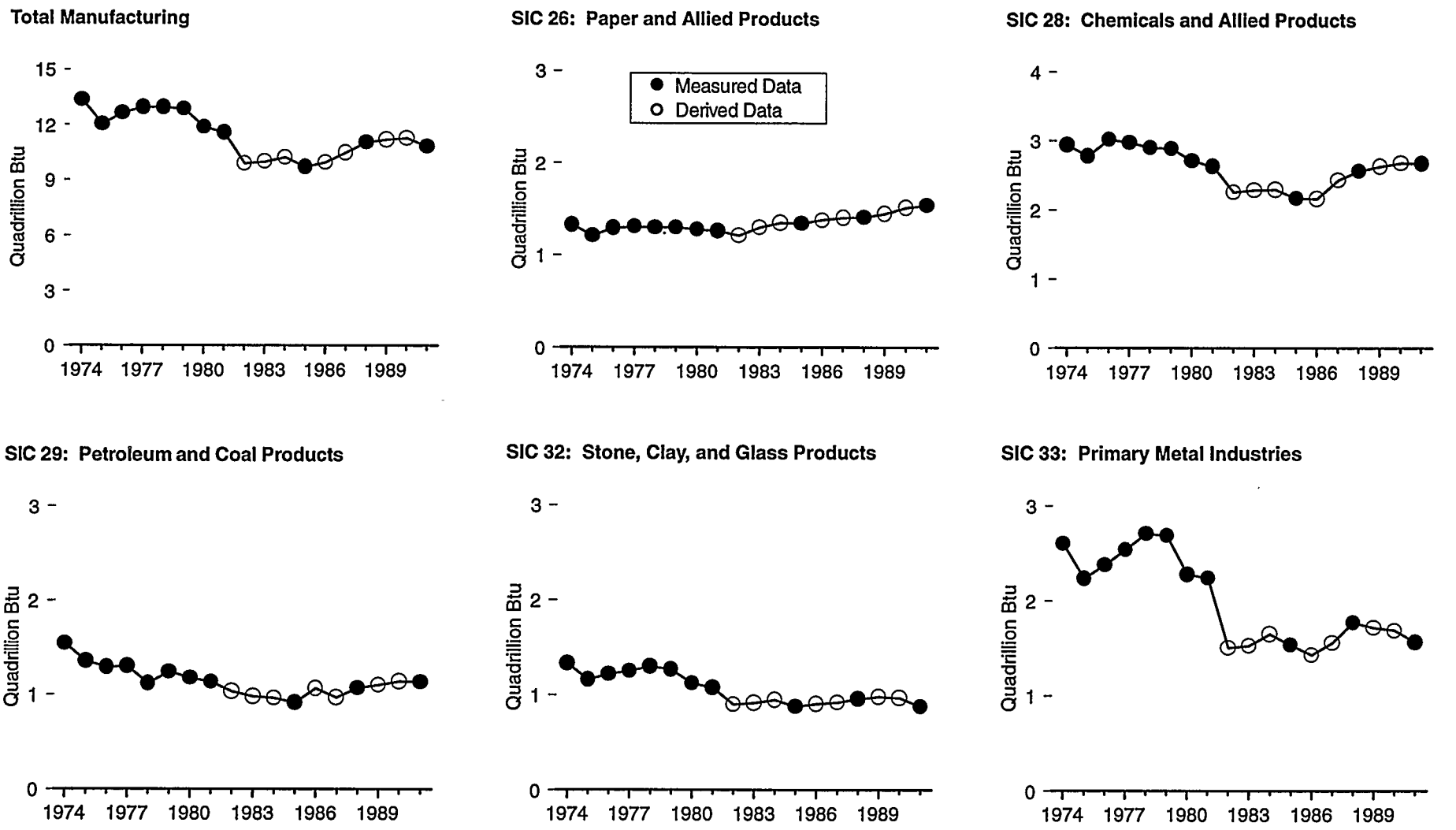
# Table 2.4 Manufacturing Energy Intensity by Industry, 1985, 1988, and 1991

| SIC [2] Code | Major Group and Industry | Offsite Energy Intensity Ratios [3] | | | Offsite Energy Intensity Change [1] (percent) | | |
|---|---|---|---|---|---|---|---|
| | | 1985 | 1988 | 1991 | 1985 to 1988 | 1985 to 1991 | 1988 to 1991 |
| 20 | Food and Kindred Products | 2.53 | 2.79 | 2.64 | -10.1 | -4.3 | 5.3 |
| 21 | Tobacco Products | NA | NA | NA | NA | NA | NA |
| 22 | Textile Mill Products | 4.49 | 4.54 | 4.67 | -1.1 | -4.0 | -2.9 |
| 23 | Apparel and Other Textile Products | NA | NA | NA | NA | NA | NA |
| 24 | Lumber and Wood Products | NA | NA | NA | NA | NA | NA |
| 25 | Furniture and Fixtures | 1.37 | 1.48 | 1.39 | -8.2 | -1.7 | 6.1 |
| 26 | Paper and Allied Products | 12.27 | 11.29 | 13.90 | 8.0 | -13.3 | -23.1 |
| 2621 | Paper Mills | 24.27 | 23.22 | 26.63 | 4.3 | -9.7 | -14.7 |
| 2631 | Paperboard Mills | 36.31 | 33.89 | 39.47 | 6.7 | -8.7 | -16.5 |
| 27 | Printing and Publishing | NA | NA | NA | NA | NA | NA |
| 28 | Chemicals and Allied Products | 11.85 | 11.28 | 11.55 | 4.8 | 2.6 | -2.3 |
| 2819 | Industrial Inorganic Chemicals, nec | 19.08 | 19.68 | 21.14 | -3.1 | -10.8 | -7.4 |
| 2821 | Plastics Materials and Resins | 10.22 | 10.42 | 9.80 | -2.0 | 4.1 | 6.0 |
| 2869 | Industrial Organic Chemicals, nec | 22.66 | 19.75 | 21.01 | 12.8 | 7.3 | -6.4 |
| 2873 | Nitrogenous Fertilizers | 79.89 | 90.60 | 111.64 | -13.4 | -39.8 | -23.2 |
| 29 | Petroleum and Coal Products | 7.63 | 7.83 | 8.33 | -2.6 | -9.2 | -6.4 |
| 2911 | Petroleum Refining | 7.75 | 7.87 | 8.63 | -1.3 | -11.0 | -9.6 |
| 30 | Rubber and Misc. Plastics Products | 3.04 | 3.05 | 2.62 | -0.5 | 13.9 | 14.3 |
| 31 | Leather and Leather Products | NA | NA | NA | NA | NA | NA |
| 32 | Stone, Clay, and Glass Products | 15.52 | 16.39 | 17.35 | -5.6 | -11.8 | -5.8 |
| 3241 | Hydraulic Cement | 81.04 | 78.06 | 86.89 | 3.7 | -7.2 | -11.3 |
| 33 | Primary Metal Industries | 13.84 | 13.66 | 13.40 | 1.3 | 3.2 | 1.9 |
| 3312 | Blast Furnaces and Steel Mills | 22.32 | 23.21 | 21.96 | -4.0 | 1.6 | 5.4 |
| 3334 | Primary Aluminum | 45.21 | 41.11 | 37.94 | 9.1 | 16.1 | 7.7 |
| 34 | Fabricated Metal Products | 2.18 | 2.33 | 2.24 | -6.8 | -2.8 | 3.8 |
| 35 | Industrial Machinery and Equipment | 1.20 | 1.10 | 1.00 | 7.8 | 16.2 | 9.0 |
| 36 | Electronic and Other Electric Equipment | 1.15 | 1.21 | 1.05 | -4.8 | 8.7 | 12.9 |
| 37 | Transportation Equipment | 1.04 | 0.97 | 1.00 | 6.8 | 4.3 | -2.7 |
| 38 | Instruments and Related Products | 1.05 | 0.91 | 0.89 | 13.2 | 15.4 | 2.5 |
| 39 | Miscellaneous Manufacturing Industries | 1.25 | 1.27 | 1.08 | [R] -1.5 | 13.6 | 14.9 |
| — | Total Manufacturing | 4.35 | 4.26 | 4.44 | 2.1 | -1.9 | -4.1 |

[1] A decrease in the energy intensity ratio results in an increase in energy efficiency represented by a positive value.
[2] Based on 1987 Standard Industrial Classification system.
[3] Thousand Btu per constant (1987) dollar of value of shipments and receipts.
R=Revised data. NA=Not available.

Note: Data for 1985 and 1988 are different from previously published data due to deflator and SIC adjustments.
Sources: • 1985—Energy Information Administration (EIA), Form EIA-846, "1985 Manufacturing Energy Consumption Survey." • 1988—EIA, Form EIA-846, "1988 Manufacturing Energy Consumption Survey." • 1991—EIA, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

## Figure 2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 2.5.

# Table 2.5 Offsite-Produced Energy Consumed for Heat and Power by Selected Industry Group, 1974-1991

(Trillion Btu)

| Year | Data Source [2] | Industry Group by SIC Code [1] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SIC 20 | SIC 22 | SIC 26 | SIC 28 | SIC 29 | SIC 30 | SIC 32 | SIC 33 | SIC 34 | SIC 35 | SIC 36 | SIC 37 | Others [3] | Total |
| 1974 | ASM | 959 | 323 | 1,327 | 2,937 | 1,545 | 247 | 1,332 | 2,604 | 408 | 367 | 251 | 375 | 661 | 13,337 |
| 1975 | ASM | 916 | 307 | 1,210 | 2,780 | 1,357 | 227 | 1,159 | 2,235 | 367 | 330 | 227 | 348 | 575 | 12,037 |
| 1976 | ASM | 938 | 329 | 1,295 | 3,017 | 1,292 | 237 | 1,220 | 2,380 | 381 | 330 | 233 | 380 | 594 | 12,625 |
| 1977 | CM | 952 | 339 | 1,308 | 2,979 | 1,303 | 272 | 1,252 | 2,539 | 395 | 340 | 249 | 390 | 610 | 12,929 |
| 1978 | ASM | 980 | 327 | 1,301 | 2,905 | 1,123 | 261 | 1,300 | 2,711 | 400 | 351 | 255 | 398 | 617 | 12,929 |
| 1979 | ASM | 949 | 315 | 1,300 | 2,889 | 1,245 | 249 | 1,266 | 2,689 | 386 | 353 | 250 | 385 | 592 | 12,867 |
| 1980 | ASM | 948 | 295 | 1,278 | 2,717 | 1,178 | 223 | 1,122 | 2,277 | 359 | 334 | 240 | 344 | 558 | 11,874 |
| 1981 | ASM | 913 | 292 | 1,262 | 2,630 | 1,137 | 223 | 1,077 | 2,241 | 352 | 325 | 235 | 329 | 546 | 11,563 |
| 1982 | Derived | *900* | *256* | *1,210* | *2,258* | *1,035* | *231* | *901* | *1,507* | *298* | *278* | *218* | *293* | *496* | *9,881* |
| 1983 | Derived | *889* | *274* | *1,299* | *2,285* | *982* | *238* | *916* | *1,528* | *288* | *257* | *229* | *307* | *499* | *9,990* |
| 1984 | Derived | *898* | *266* | *1,349* | *2,295* | *966* | *236* | *945* | *1,650* | *319* | *268* | *235* | *325* | *510* | *10,221* |
| 1985 | MECS | 876 | 247 | 1,340 | 2,170 | 917 | 211 | 878 | 1,537 | 297 | 241 | 209 | 322 | 452 | 9,698 |
| 1986 | Derived | *894* | *258* | *1,379* | *2,167* | *1,068* | *232* | *903* | *1,431* | *302* | *243* | *219* | *339* | *502* | *9,935* |
| 1987 | Derived | *921* | *278* | *1,402* | *2,436* | *972* | *250* | *921* | *1,560* | *323* | *261* | *207* | *348* | *583* | *10,461* |
| 1988 | MECS | 946 | 276 | 1,409 | 2,568 | 1,070 | 251 | 959 | 1,773 | 343 | 278 | 215 | 350 | 616 | 11,052 |
| 1989 | Derived | *946* | *280* | *1,446* | *2,630* | *1,105* | *259* | *978* | *1,720* | *345* | *284* | *217* | *356* | *617* | *11,183* |
| 1990 | Derived | *942* | *273* | *1,514* | *2,683* | *1,140* | *255* | *970* | *1,690* | *335* | *277* | *215* | *352* | *612* | *11,256* |
| 1991 | MECS | 922 | 272 | 1,540 | 2,674 | 1,138 | 235 | 877 | 1,563 | 305 | 236 | 196 | 318 | 561 | 10,837 |

[1] Standard Industrial Classification (SIC) code industry groups displayed are:
SIC 20 Food and Kindred Products
SIC 22 Textile Mill Products
SIC 26 Paper and Allied Products
SIC 28 Chemicals and Allied Products
SIC 29 Petroleum and Coal Products
SIC 30 Rubber and Misc. Plastics Products
SIC 32 Stone, Clay, and Glass Products
SIC 33 Primary Metal Industries
SIC 34 Fabricated Metal Products
SIC 35 Industrial Machinery and Equipment
SIC 36 Electronic and Other Electric Equipment
SIC 37 Transportation Equipment.

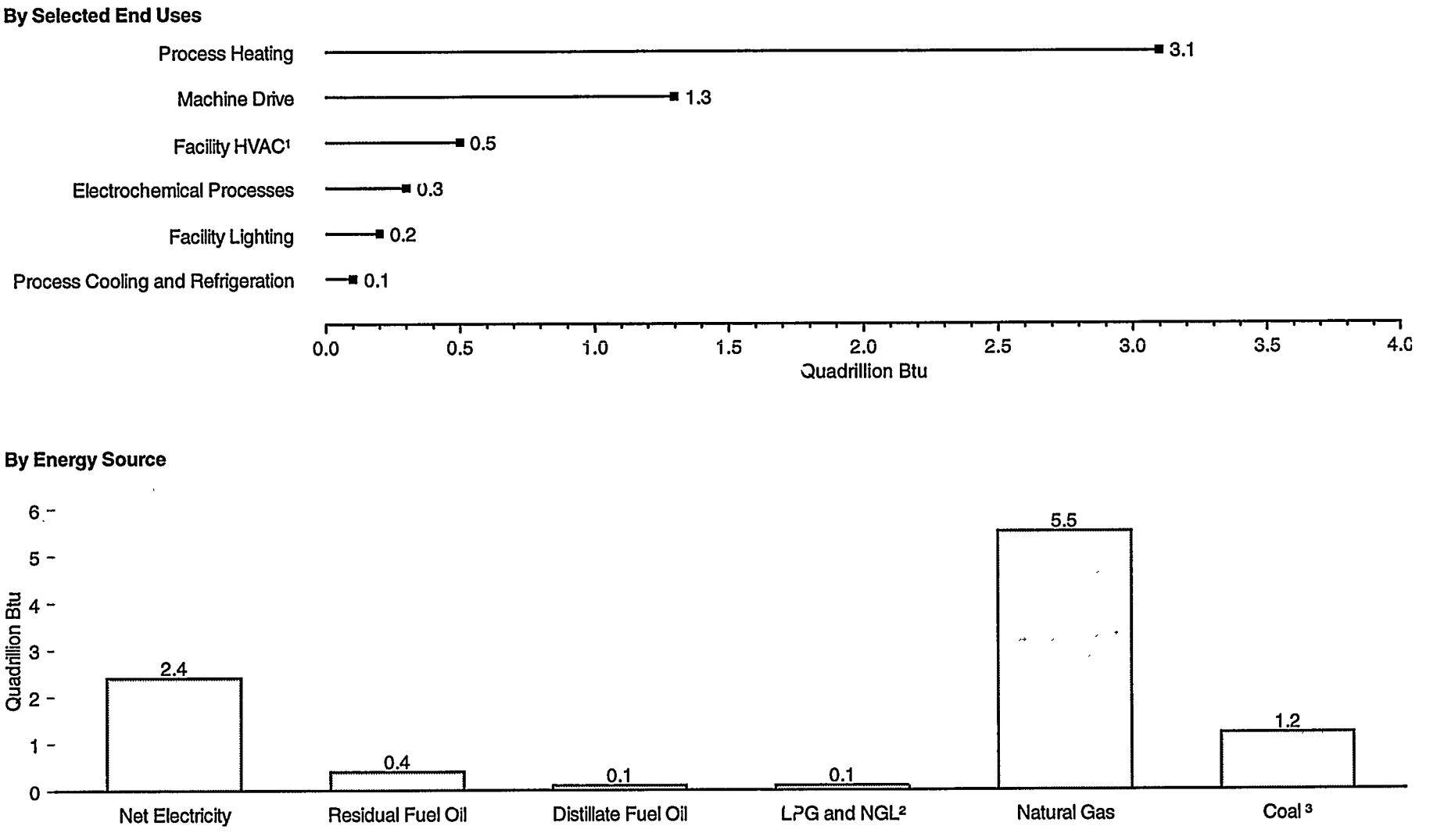
[2] ASM = U.S. Department of Commerce, Bureau of the Census, *Annual Survey of Manufactures: Fuels and Electric Energy Consumed, 1974-1976* and *1978-1981*.
CM = U.S. Department of Commerce, Bureau of the Census, *Census of Manufactures: Fuels and Electric Energy Consumed, 1977*.
MECS = Energy Information Administration, Office of Energy Markets and End Use, *Manufacturing Energy Consumption Survey: Consumption of Energy, 1985*, and *1988*.
Derived = Estimates derived by using consumption data from MECS and ASM and Federal Reserve Board production indices from the *Statistical Abstract of the United States, 1984, 1990*, and *1993*.

[3] Others are SIC 21 Tobacco Products; SIC 23 Apparel and Other Textile Products; SIC 24 Lumber and Wood Products; SIC 25 Furniture and Fixtures; SIC 27 Printing and Publishing; SIC 31 Leather and Leather Products; SIC 38 Instruments and Related Products; and SIC 39 Miscellaneous Manufacturing Industries.

Note: • Totals may not equal sum of components due to independent rounding. • Data represent the purchased consumption, defined as consumption of energy that was originally produced offsite and acquired as a result of a purchase or transfer and consumed onsite for the production of heat and power. • 1974-1986 data based on 1972 Standard Industrial Classification system. 1987-1991 data based on 1987 Standard Industrial Classification system.

Sources: • 1974-1984, 1986, and 1987—Energy Information Administration (EIA), *Derived Annual Estimates of Manufacturing Energy Consumption, 1974-1988* (August 1992), Table 1. • 1985 and 1988 forward—EIA, Form EIA-846, "1991 Manufacturing Energy Consumption Survey and unpublished estimates."

## Figure 2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation, 1991




[1] Heating, ventilation, and air conditioning.
[2] Liquefied petroleum gases and natural gas liquids.
[3] Excluding coal coke and breeze.
Source: Table 2.6.

# Table 2.6 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Energy Source, 1991

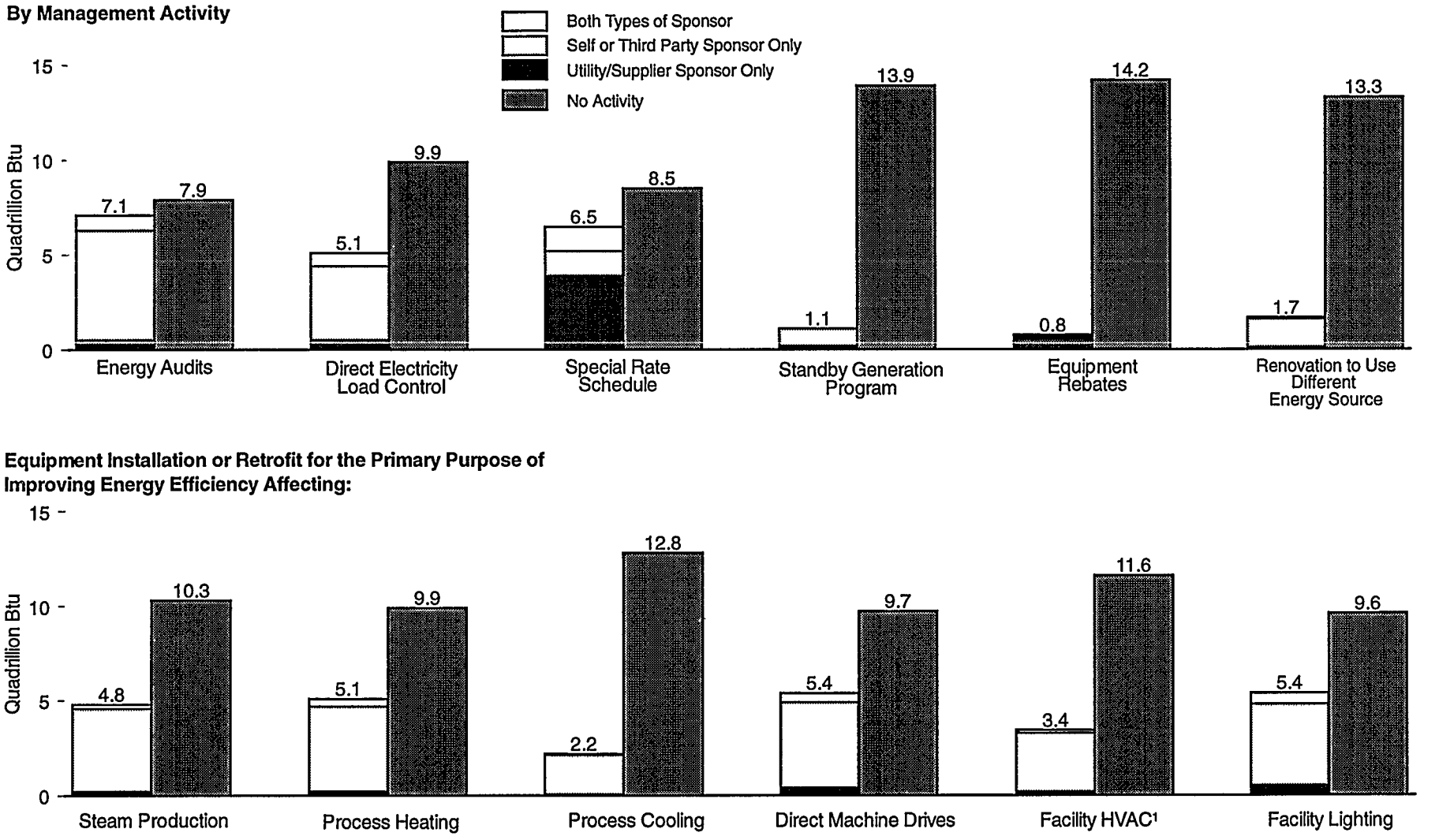
| End-Use Category | Net Electricity [1] | Residual Fuel Oil | Distillate Fuel Oil [2] | LPG and NGL [3] | Natural Gas [4] | Coal (Excluding Coal Coke and Breeze) | Total [5] |
|---|---|---|---|---|---|---|---|
| | Million Kilowatthours | Thousand Barrels | | | Billion Cubic Feet | Thousand Short Tons | |
| **Indirect End Use (Boiler Fuel)** | W | 47,009 | 6,850 | 4,928 | 2,037 | 38,473 | |
| **Direct End Use** | | | | | | | |
| **All Process Uses** | 546,382 | 17,342 | 5,800 | 16,908 | 2,503 | 14,075 | |
| Process Heating [6] | 68,853 | 16,959 | 3,177 | 12,704 | 2,312 | 14,075 | |
| Process Cooling and Refrigeration | 36,330 | 6 | 30 | 18 | 13 | 0 | |
| Machine Drive | 347,899 | 353 | 2,398 | 4,093 | 123 | 0 | |
| Electrochemical Processes | 89,005 | — | — | — | — | — | |
| Other Process Uses | 4,295 | 24 | 196 | 93 | 55 | (s) | |
| **All Non-Process Uses** | 116,156 | 1,148 | 9,134 | 5,105 | 682 | W | |
| Facility Heating, Ventilation, and Air Conditioning [6] | 56,165 | 673 | 1,372 | 731 | 275 | 15 | |
| Facility Lighting | 47,309 | — | — | — | — | — | |
| Other Facility Support | 10,537 | W | 81 | 62 | 22 | 0 | |
| Onsite Transportation | 1,114 | — | 6,533 | 4,242 | (s) | — | |
| Conventional Electricity Generation | — | 325 | 734 | 41 | 337 | W | |
| Other Non-Process Use | 1,031 | W | 413 | 30 | 48 | 0 | |
| **End Use Not Reported** | W | 339 | 2,101 | 1,028 | 124 | W | |
| **Total** | 694,702 | 65,837 | 23,885 | 27,970 | 5,345 | 53,035 | |
| | | | | Trillion Btu | | | |
| **Indirect End Use (Boiler Fuel)** | W | 296 | 40 | 18 | 2,098 | 859 | W |
| **Direct End Use** | | | | | | | |
| **All Process Uses** | 1,864 | 109 | 34 | 64 | 2,578 | 314 | 4,963 |
| Process Heating [6] | 235 | 107 | 19 | 49 | 2,382 | 314 | 3,106 |
| Process Cooling and Refrigeration | 124 | (s) | (s) | (s) | 13 | 0 | 137 |
| Machine Drive | 1,187 | 2 | 14 | 15 | 127 | 0 | 1,345 |
| Electrochemical Processes | 304 | — | — | — | — | — | 304 |
| Other Process Uses | 15 | (s) | 1 | (s) | 56 | (s) | 72 |
| **All Non-Process Uses** | 396 | 7 | 53 | 19 | 702 | W | W |
| Facility Heating, Ventilation, and Air Conditioning [6] | 192 | 4 | 8 | 3 | 283 | (s) | 490 |
| Facility Lighting | 161 | — | — | — | — | — | 161 |
| Other Facility Support | 36 | W | (s) | (s) | 23 | 0 | W |
| Onsite Transportation | 4 | — | 38 | 16 | (s) | — | 58 |
| Conventional Electricity Generation | — | 2 | 4 | (s) | 347 | W | W |
| Other Non-Process Use | 4 | W | 2 | (s) | 49 | 0 | W |
| **End Use Not Reported** | W | 2 | 12 | 4 | 128 | W | W |
| **Total** | 2,370 | 414 | 139 | 105 | 5,506 | 1,184 | 9,718 |

[1] "Net Electricity" is obtained by summing purchases, transfers in, and generation from noncombustible renewable resources, minus quantitities sold and transferred out.
[2] Includes fuel oil nos. 1, 2, and 4, and diesel fuel nos. 1, 2, and 4.
[3] Liquefied petroleum gases and natural gas liquids.
[4] Includes natural gas obtained from utilities, transmission pipelines, any other supplier(s), such as brokers and producers.
[5] Total of major energy sources. The top half of the "Total" column is blank because different physical units cannot be added.
[6] Excludes steam and hot water.
— = Estimation of energy input quantity is not applicable. W=Withheld to avoid disclosing data for individual establishments. Data are included in higher level totals. (s)=Less than 0.5 rounded to zero.

Notes: • Totals may not equal sum of components due to independent rounding. • The estimates of combustible energy presented in this table are for the total consumption of energy for the production of heat and power, regardless of where the energy was produced. Specifically, the estimates include the quantities of energy that were originally produced offsite and purchased by or transferred to the establishment, plus those that were produced onsite from other energy or input materials not classified as energy, or were extracted from captive (onsite) mines or wells. • Allocations to end uses are made on the basis of reasonable approximations by respondents.

Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

## Figure 2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present From 1989-1991




[1] Heating, ventilation, and air conditioning.

Note: These energy management activities are commonly called demand-side management programs when conducted by utility or supplier.

Source: Table 2.7.

# Table 2.7 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation in 1991 by Energy Management Activity Present From 1989-1991

| Sponsorship [1] | Energy Audits | Direct Electricity Load Control | Special Rate Schedule [2] | Standby Generation Program | Equipment Rebates | Equipment Installation or Retrofit for the Primary Purpose of Improving Energy Efficiency Affecting: Steam Production [3] | Process Heating | Process Cooling | Direct Machine Drives [4] | Facility HVAC [5] | Facility Lighting | Renovation to Use Different Energy Source [6] | Other [7] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quadrillion Btu | | | | | | | | | | | | |
| **Any Type of Sponsor** | 7.083 | 5.086 | 6.517 | 1.133 | 0.783 | 4.757 | 5.146 | 2.212 | 5.354 | 3.424 | 5.405 | 1.693 | 0.376 |
| Utility/Supplier Sponsor Only [8] | 0.532 | 0.565 | 3.939 | 0.176 | 0.582 | 0.200 | 0.209 | 0.069 | 0.351 | 0.175 | 0.518 | 0.049 | 0.056 |
| Self or Third Party Sponsor Only | 5.757 | 3.853 | 1.269 | 0.918 | 0.095 | 4.360 | 4.517 | 2.059 | 4.511 | 3.061 | 4.285 | 1.525 | 0.271 |
| Both | 0.793 | 0.668 | 1.310 | 0.038 | 0.106 | 0.197 | 0.419 | 0.084 | 0.493 | 0.187 | 0.602 | 0.120 | 0.049 |
| **No Activity** | 7.944 | 9.941 | 8.509 | 13.894 | 14.244 | 10.269 | 9.881 | 12.815 | 9.672 | 11.603 | 9.622 | 13.333 | 14.651 |
| **Total** | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 | 15.027 |
| | Percent | | | | | | | | | | | | |
| **Any Type of Sponsor** | 47.1 | 33.8 | 43.4 | 7.5 | 5.2 | 31.7 | 34.2 | 14.7 | 35.6 | 22.8 | 36.0 | 11.3 | 2.5 |
| Utility/Supplier Sponsor Only [8] | 3.5 | 3.8 | 26.2 | 1.2 | 3.9 | 1.3 | 1.4 | 0.5 | 2.3 | 1.2 | 3.4 | 0.3 | 0.4 |
| Self or Third Party Sponsor Only | 38.3 | 25.6 | 8.4 | 6.1 | 0.6 | 29.0 | 30.1 | 13.7 | 30.0 | 20.4 | 28.5 | 10.1 | 1.8 |
| Both | 5.3 | 4.4 | 8.7 | 0.3 | 0.7 | 1.3 | 2.8 | 0.6 | 3.3 | 1.2 | 4.0 | 0.8 | 0.3 |
| **No Activity** | 52.9 | 66.2 | 56.6 | 92.5 | 94.8 | 63.3 | 65.8 | 85.3 | 64.4 | 77.2 | 64.0 | 88.7 | 97.5 |
| **Total** | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

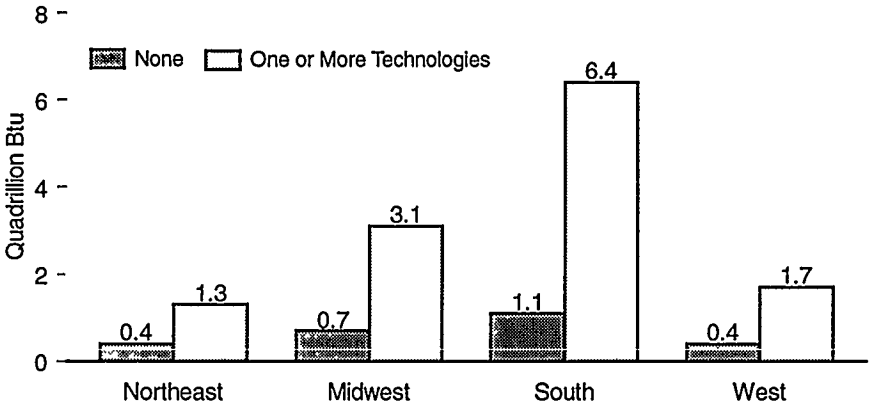
[1] Sponsorship of an energy management activity was determined by the manufacturing establishment.
[2] For example, interruptible or time-of-use rates.
[3] For example, boilers or nozzles.
[4] For example, adjustable-speed drives, motors, and pumps.
[5] Heating, ventilation, and air conditioning.
[6] Equipment retrofit or installation for the primary purpose of using different energy source (e.g., electrification).
[7] Included are power factor corrections, improvements in operating procedures, and other energy management activities reported by survey respondents.
[8] These energy management activities are commonly called demand-side management programs when conducted by utility or supplier.

Note: Totals may not equal sum of components due to independent rounding.

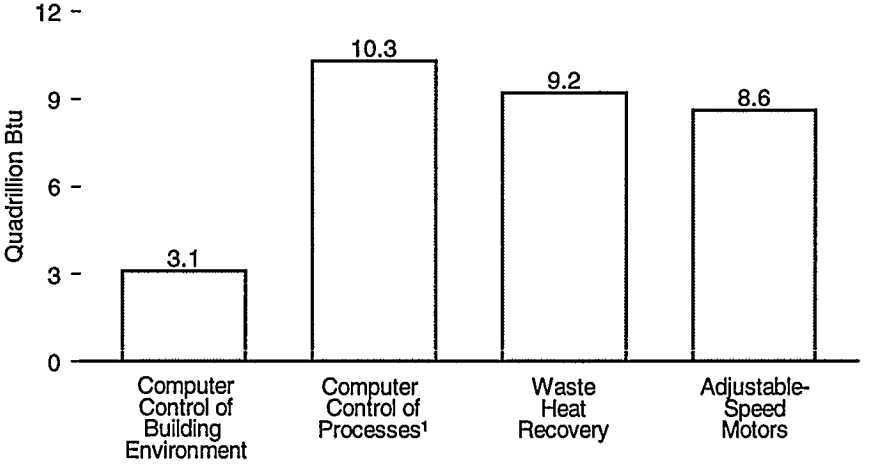
Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

# Figure 2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991

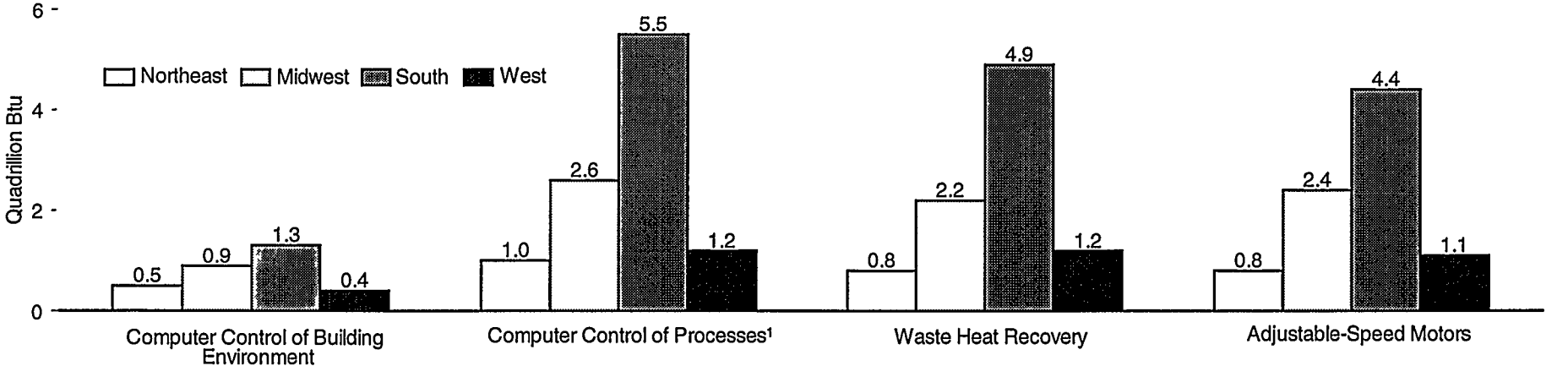
### Either No Presence or Presence of Energy-Related Technologies, by Region




### Energy-Related Technologies by Technology Type




### Energy-Related Technologies by Technology Type by Region




[1] Or major energy-using equipment.

Notes: • See Appendix F for Census regions. • Because vertical scales differ, graphs should not be compared.

Source: Table 2.8.

# Table 2.8 Manufacturing Sector Inputs for Heat, Power, and Electricity Generation by Technology, 1991

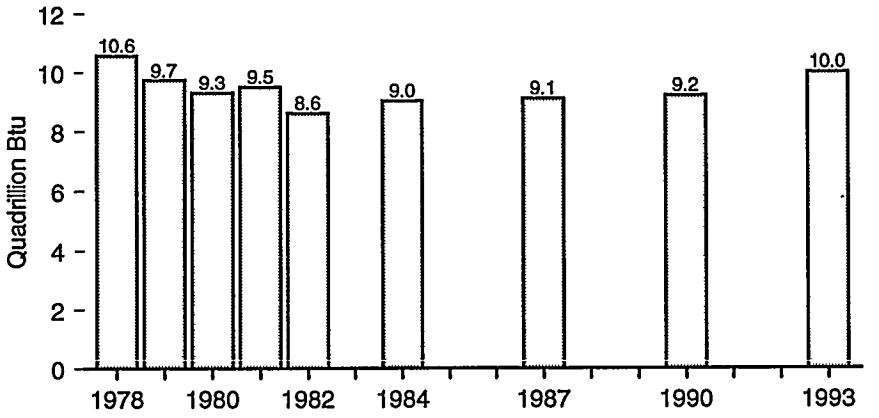
| Census Region [1] | Total | No Presence of Selected Technologies [2] | Presence of One or More Selected Technologies [2] | Types of General Energy-Related Technologies | | | |
|---|---|---|---|---|---|---|---|
| | | | | Computer Control of Building Environment [3] | Computer Control of Processes or Major Energy-Using Equipment [4] | Waste Heat Recovery | Adjustable-Speed Motors |
| | Quadrillion Btu | | | | | | |
| Northeast | 1.635 | 0.352 | 1.282 | 0.473 | 1.033 | 0.828 | 0.791 |
| Midwest | 3.833 | 0.703 | 3.130 | 0.942 | 2.570 | 2.219 | 2.356 |
| South | 7.507 | 1.078 | 6.429 | 1.260 | 5.463 | 4.931 | 4.365 |
| West | 2.052 | 0.383 | 1.669 | 0.406 | 1.235 | 1.180 | 1.112 |
| **United States** | **15.027** | **2.516** | **12.510** | **3.081** | **10.300** | **9.158** | **8.623** |
| | Percent | | | | | | |
| Northeast | 10.9 | 14.0 | 10.2 | 15.4 | 10.0 | 9.0 | 9.2 |
| Midwest | 25.5 | 27.9 | 25.0 | 30.6 | 25.0 | 24.2 | 27.3 |
| South | 50.0 | 42.8 | 51.4 | 40.9 | 53.0 | 53.8 | 50.6 |
| West | 13.7 | 15.2 | 13.3 | 13.2 | 12.0 | 12.9 | 12.9 |
| **United States** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |

[1] See Appendix F for Census regions.
[2] "Selected Technologies" include both general and industry-specific technologies.
[3] For example, space heating or cooling and lighting.
[4] For example, boilers, furnaces, and conveyers.

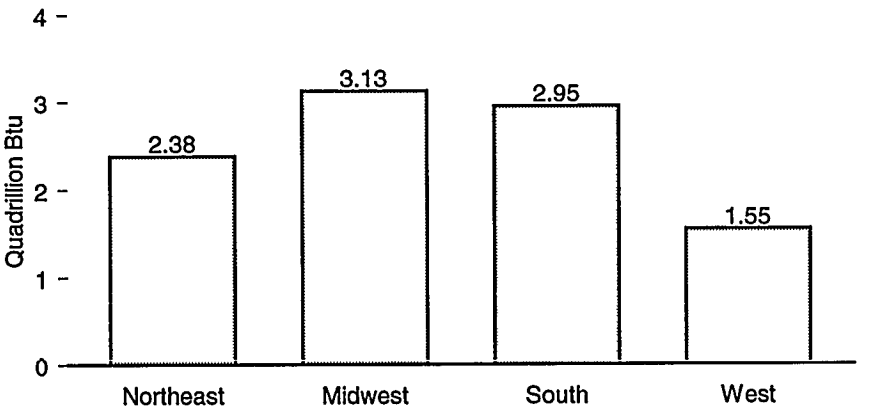
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Form EIA-846, "1991 Manufacturing Energy Consumption Survey."

# Figure 2.9 Household Energy Consumption

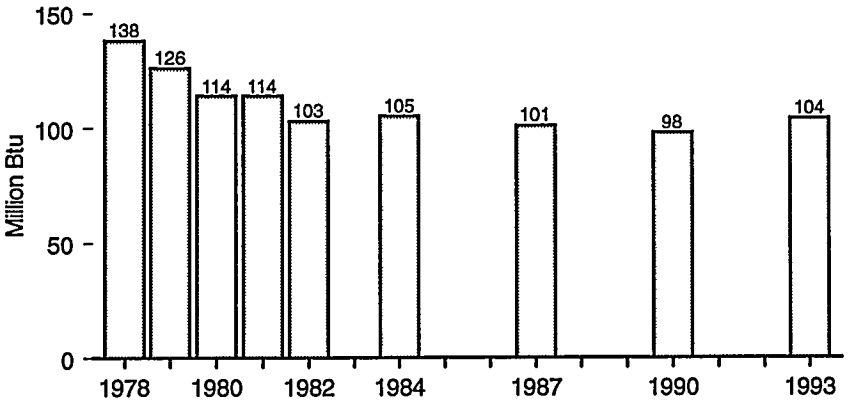
### Consumption by All Households, Selected Years, 1978-1993



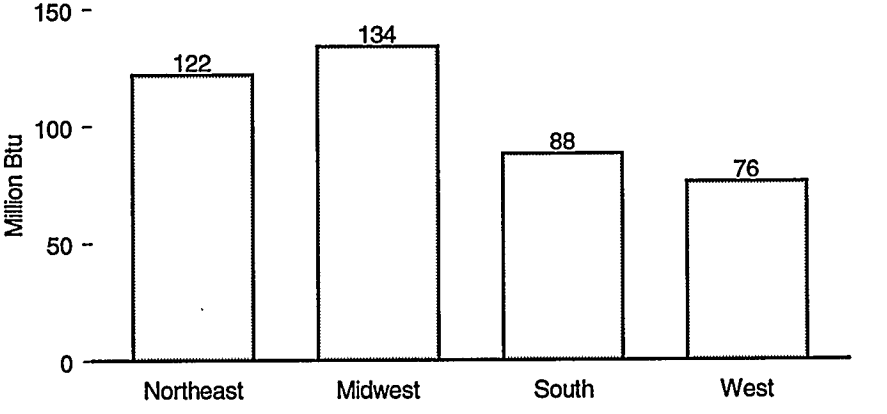

### Consumption by All Households, by Census Region, 1993




### Consumption per Household, Selected Years, 1978-1993




### Consumption per Household, by Census Region, 1993




Notes: • No data are available for years not shown. Data for 1978 through 1984 are for April of the year shown through March of the following year; data for 1987, 1990, and 1993 are for the calendar year. • Because vertical scales differ, graphs should not be compared.

Source: Table 2.9. See Appendix F for Census regions.

# Table 2.9 Household Energy Consumption by Census Region, Selected Years, 1978-1993

(Quadrillion Btu, Except as Noted)

| Census Region [1] | 1978 | 1979 | 1980 | 1981 | 1982 | 1984 | 1987 | 1990 | 1993 |
|---|---|---|---|---|---|---|---|---|---|
| **Northeast** | **2.89** | **2.50** | **2.43** | **2.47** | **2.18** | **2.29** | **2.37** | **2.30** | **2.38** |
| Natural Gas | 1.14 | 1.05 | 0.92 | 1.06 | 0.99 | 0.93 | 1.03 | 1.03 | 1.11 |
| Electricity [2] | 0.39 | 0.39 | 0.39 | 0.42 | 0.38 | 0.41 | 0.44 | 0.47 | 0.47 |
| Distillate Fuel Oil and Kerosene | 1.32 | 1.03 | 1.09 | 0.96 | 0.79 | 0.93 | 0.87 | 0.78 | 0.78 |
| Liquefied Petroleum Gases | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.03 | 0.02 | 0.02 | 0.03 |
| Consumption per Household (million Btu) | 166 | 145 | 138 | 138 | 122 | 125 | 124 | 120 | 122 |
| **Midwest** | **3.70** | **3.48** | **2.92** | **3.12** | **2.60** | **2.80** | **2.73** | **2.81** | **3.13** |
| Natural Gas | 2.53 | 2.48 | 2.02 | 2.24 | 1.76 | 1.99 | 1.83 | 1.88 | 2.07 |
| Electricity [2] | 0.60 | 0.59 | 0.60 | 0.57 | 0.57 | 0.55 | 0.61 | 0.66 | 0.74 |
| Distillate Fuel Oil and Kerosene | 0.46 | 0.31 | 0.16 | 0.17 | 0.15 | 0.13 | 0.16 | R0.13 | 0.13 |
| Liquefied Petroleum Gases | 0.12 | 0.10 | 0.15 | 0.13 | 0.11 | 0.13 | 0.13 | 0.13 | 0.19 |
| Consumption per Household (million Btu) | 180 | 168 | 139 | 147 | 122 | 129 | 123 | 122 | 134 |
| **South** | **2.43** | **2.30** | **2.59** | **2.46** | **2.46** | **2.50** | **2.61** | **2.60** | **2.95** |
| Natural Gas | 0.96 | 0.91 | 1.11 | 1.16 | 1.13 | 1.15 | 1.09 | 1.03 | 1.18 |
| Electricity [2] | 1.00 | 0.97 | 1.06 | 1.03 | 1.05 | 1.06 | 1.22 | 1.36 | 1.51 |
| Distillate Fuel Oil and Kerosene | 0.32 | 0.28 | 0.27 | 0.16 | 0.17 | 0.16 | 0.17 | 0.11 | 0.13 |
| Liquefied Petroleum Gases | 0.15 | 0.14 | 0.15 | 0.12 | 0.12 | 0.12 | 0.12 | 0.10 | 0.13 |
| Consumption per Household (million Btu) | 99 | 92 | 96 | 89 | 88 | 85 | 84 | 81 | 88 |
| **West** | **1.54** | **1.47** | **1.38** | **1.47** | **1.38** | **1.45** | **1.42** | **1.51** | **1.55** |
| Natural Gas | 0.95 | 0.88 | 0.89 | 0.93 | 0.89 | 0.91 | 0.88 | 0.92 | 0.91 |
| Electricity [2] | 0.48 | 0.47 | 0.41 | 0.46 | 0.42 | 0.47 | 0.48 | 0.54 | 0.56 |
| Distillate Fuel Oil and Kerosene | 0.09 | 0.09 | 0.04 | 0.03 | 0.03 | 0.04 | 0.02 | R0.02 | 0.03 |
| Liquefied Petroleum Gases | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 | 0.05 | 0.03 | 0.04 |
| Consumption per Household (million Btu) | 110 | 100 | 86 | 90 | 84 | 85 | 78 | 78 | 76 |
| **United States** | **10.56** | **9.74** | **9.32** | **9.51** | **8.62** | **9.04** | **9.13** | **9.22** | **10.01** |
| Natural Gas | 5.58 | 5.31 | 4.94 | 5.39 | 4.77 | 4.98 | 4.83 | 4.86 | 5.27 |
| Electricity [2] | 2.47 | 2.42 | 2.46 | 2.48 | 2.42 | 2.48 | 2.76 | 3.03 | 3.28 |
| Distillate Fuel Oil and Kerosene | 2.19 | 1.71 | 1.55 | 1.33 | 1.14 | 1.26 | 1.22 | 1.04 | 1.07 |
| Liquefied Petroleum Gases | 0.33 | 0.31 | 0.36 | 0.31 | 0.29 | 0.31 | 0.32 | 0.28 | 0.38 |
| Consumption per Household (million Btu) [3] | 138 | 126 | 114 | 114 | 103 | 105 | 101 | 98 | 104 |

[1] See Appendix F for Census regions.

[2] Includes site electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

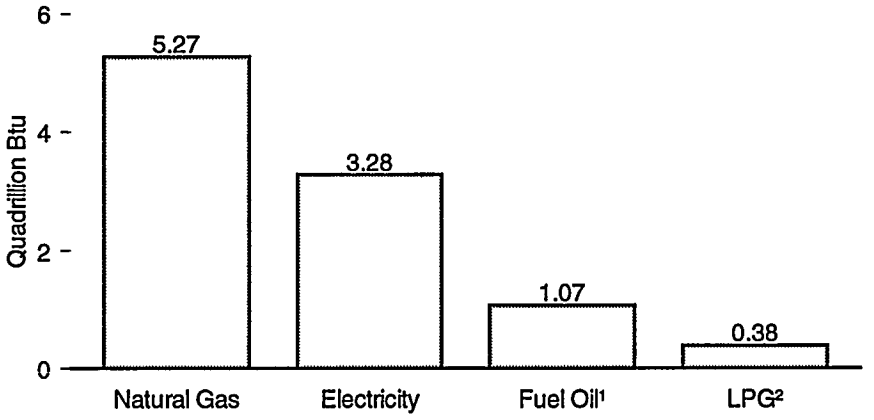
[3] Data not adjusted to account for more severe winter weather in earlier years when the survey was fielded. 1993 weather was normal, similar to that for 1982 and 1984.

Notes: • This table shows major energy items only. • No data are available for years not shown. • One Btu of electricity = 0.000293 (1 ÷ 3,412) kWh. • Data for 1978-1984 are for April of year shown through March of following year; data for 1987, 1990, and 1993 are for the calendar year. • Totals may not equal sum of components due to independent rounding.

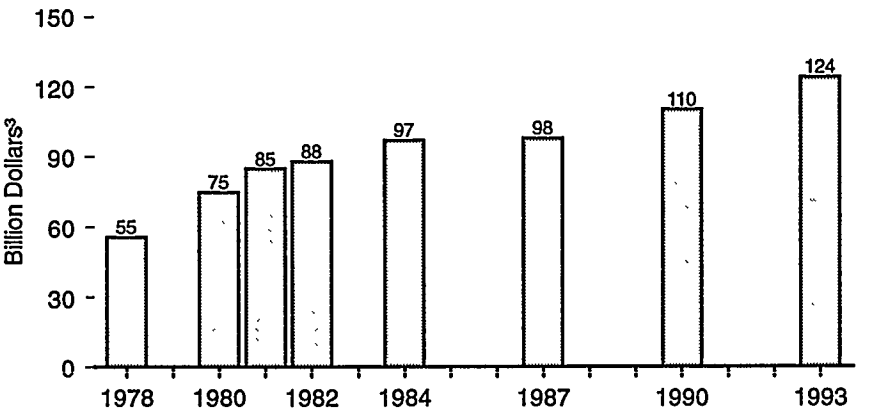
Sources: • 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

# Figure 2.10 Household Energy Consumption and Expenditures

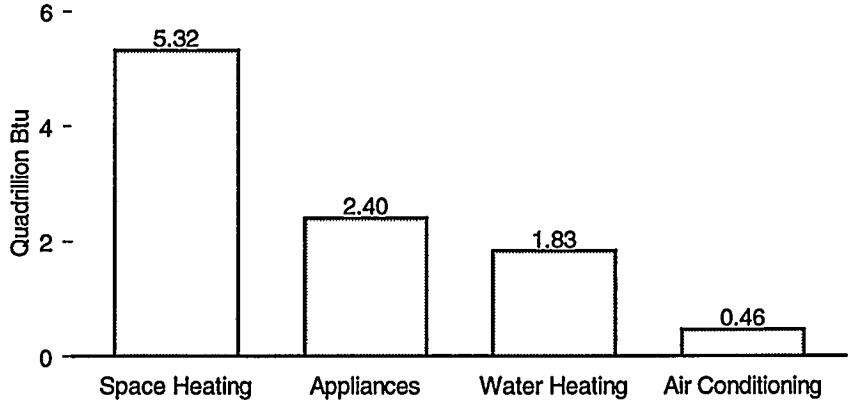
### Consumption by Energy Source, 1993



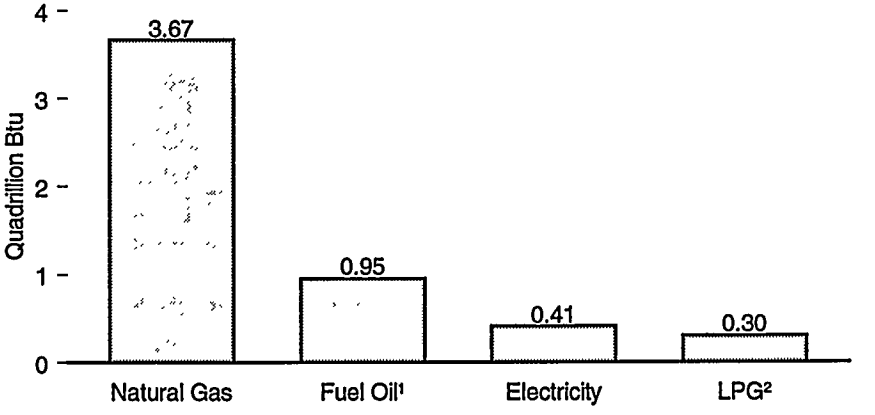

### Expenditures, Selected Years, 1978-1993




### Consumption by End Use, 1993




### Consumption for Space Heating, 1993




¹ Fuel oil is distillate fuel oil and kerosene.
² Liquefied petroleum gases.
³ Nominal dollars.

Notes: • No data are available for years not shown. • Because vertical scales differ, graphs should not be compared.
Source: Table 2.10.

# Table 2.10 Household Energy Consumption and Expenditures by End Use and Energy Source, Selected Years, 1978-1993

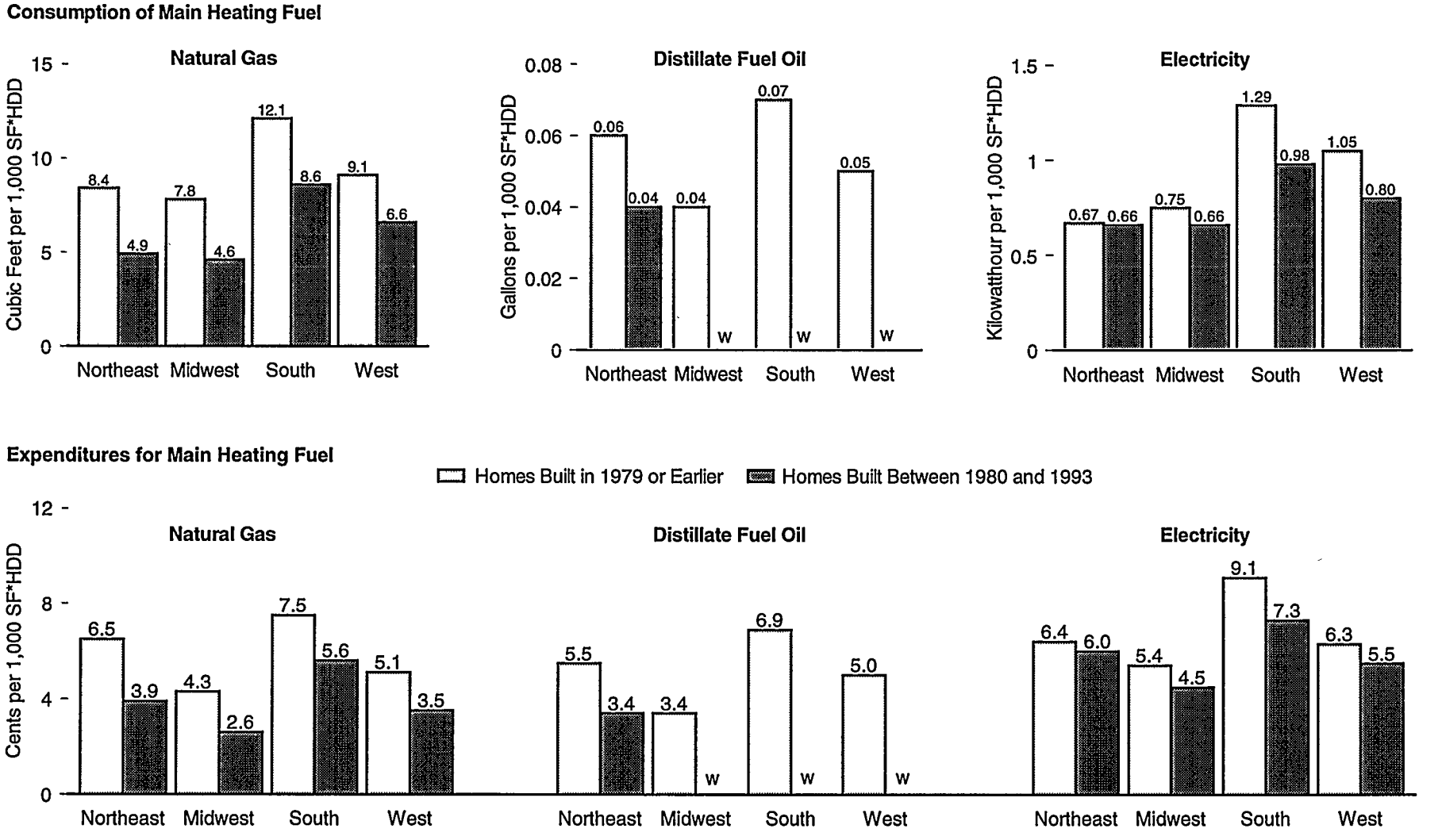
| Year | Space Heating | | | | A/C [1,2] | Water Heating | | | | Appliances [3] | | | Total [2] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Natural Gas | Electricity [4] | Fuel Oil [5] | LPG [6] | Electricity [4] | Natural Gas | Electricity [4] | Fuel Oil [5] | LPG [6] | Natural Gas | Electricity [4] | LPG [6] | Natural Gas | Electricity [4] | Fuel Oil [5] | LPG [6] |
| | Consumption (quadrillion Btu) | | | | | | | | | | | | | | | |
| 1978 | 4.26 | R0.40 | 2.05 | 0.23 | 0.31 | 1.04 | 0.29 | 0.14 | 0.06 | 0.28 | 1.46 | 0.03 | 5.58 | 2.47 | 2.19 | 0.33 |
| 1980 | 3.32 | 0.28 | 1.32 | 0.25 | 0.32 | 1.24 | 0.31 | 0.24 | 0.07 | 0.38 | 1.55 | 0.04 | 4.94 | 2.46 | 1.55 | 0.36 |
| 1981 | R3.80 | 0.30 | R1.12 | 0.22 | 0.33 | 1.10 | 0.33 | R0.20 | 0.06 | 0.49 | 1.53 | 0.03 | 5.39 | 2.48 | 1.33 | 0.31 |
| 1982 | 3.31 | 0.27 | 1.05 | 0.19 | 0.30 | 1.08 | 0.33 | 0.09 | 0.06 | 0.39 | 1.52 | 0.04 | 4.77 | 2.42 | 1.14 | 0.29 |
| 1984 | 3.51 | 0.30 | R1.11 | 0.21 | R0.33 | 1.10 | 0.32 | 0.15 | 0.06 | 0.35 | 1.53 | 0.04 | 4.98 | 2.48 | 1.26 | 0.31 |
| 1987 | 3.38 | 0.28 | 1.05 | 0.22 | 0.44 | 1.10 | 0.31 | 0.17 | 0.06 | 0.34 | 1.72 | 0.04 | 4.83 | 2.76 | 1.22 | 0.32 |
| 1990 | 3.37 | 0.30 | R0.93 | 0.19 | 0.48 | 1.16 | 0.34 | 0.11 | 0.06 | 0.33 | 1.91 | 0.03 | 4.86 | 3.03 | 1.04 | 0.28 |
| 1993 | 3.67 | 0.41 | 0.95 | 0.30 | 0.46 | 1.31 | 0.34 | 0.12 | 0.05 | 0.29 | R2.08 | 0.03 | 5.27 | 3.28 | 1.07 | 0.38 |
| | Expenditures (billion dollars[7]) | | | | | | | | | | | | | | | |
| 1978 | 11.49 | 3.53 | 8.06 | 1.05 | 3.97 | 2.88 | 3.15 | 0.56 | 0.36 | 0.93 | 19.24 | 0.25 | 15.30 | 29.89 | 8.62 | 1.66 |
| 1980 | 12.80 | 3.71 | 10.59 | 1.90 | 5.07 | 4.79 | 4.54 | 1.89 | 0.59 | 1.71 | 26.82 | R0.40 | 19.30 | 40.14 | 12.48 | 2.89 |
| 1981 | 17.07 | 4.60 | 9.99 | 1.84 | 5.96 | 4.93 | 5.32 | 1.83 | 0.53 | 2.50 | 30.02 | 0.37 | 24.50 | 45.90 | 11.82 | 2.74 |
| 1982 | 18.55 | 4.45 | 8.84 | 1.68 | 6.05 | 6.08 | 5.90 | 0.75 | 0.57 | 2.42 | 32.02 | 0.47 | 27.06 | 48.42 | 9.59 | 2.72 |
| 1984 | 20.66 | 5.71 | 8.51 | 2.00 | R7.37 | 6.63 | 6.44 | 1.09 | 0.58 | 2.31 | R34.96 | 0.54 | R29.78 | R54.48 | 9.60 | R3.12 |
| 1987 | 18.05 | 5.53 | 6.25 | 1.85 | 9.77 | 6.02 | 6.45 | 0.94 | 0.50 | 2.02 | 39.83 | 0.46 | 26.15 | 61.58 | 7.21 | 2.81 |
| 1990 | 18.59 | 6.16 | 7.42 | 2.01 | 11.19 | 6.59 | 7.21 | 0.83 | R0.65 | 2.03 | 46.95 | 0.48 | 27.26 | 71.54 | 8.25 | 3.14 |
| 1993 | 21.95 | 8.66 | R6.24 | 2.81 | 11.30 | 8.08 | 7.58 | R0.74 | 0.58 | 1.98 | R53.52 | 0.42 | 32.04 | 81.08 | 6.98 | 3.81 |

[1] A/C = Air conditioning.
[2] A small amount of natural gas used for air conditioning is included in "Natural Gas" under "Total."
[3] Includes refrigerators.
[4] Includes electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal electricity.
[5] Fuel oil is distillate fuel oil and kerosene. Includes a small amount of fuel oil or kerosene used for appliances.
[6] Liquefied petroleum gases.
[7] Nominal dollars.

Notes: • No data are available for years not shown. Consumption totals for 1979 are available on Table 2.9. • One Btu of electricity = 0.000293 (1 + 3,412) kWh. • Totals may not equal sum of components due to independent rounding.

Sources: • 1978—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

# Figure 2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993




W=Data withheld because fewer than 10 housing units were sampled.
Note: SF*HDD=square footage times heating degree-days.

Source: Table 2.11. See Appendix F for Census regions.

# Table 2.11 Household Energy Consumption and Expenditure Indicators by Census Region and Vintage of Housing Unit, 1993

| Source and Indicator (Units) | Census Regions [1] | | | | | | | | United States | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Northeast | | Midwest | | South | | West | | | |
| | Built in 1979 or Earlier | Built Between 1980-1993 | Built in 1979 or Earlier | Built Between 1980-1993 | Built in 1979 or Earlier | Built Between 1980-1993 | Built in 1979 or Earlier | Built Between 1980-1993 | Built in 1979 or Earlier | Built Between 1980-1993 |
| **Natural Gas** | | | | | | | | | | |
| Households Using Natural Gas as Main Space Heating Source (million) | 8.2 | 1.3 | 14.4 | 2.5 | 9.7 | 3.3 | 9.6 | 2.5 | 41.8 | 9.6 |
| Annual Consumption per Household for Main Space Heating (1,000 cubic feet) | 83.2 | 54.9 | 93.1 | 70.9 | 60.9 | 46.7 | 43.5 | 46.8 | 72.3 | 54.2 |
| Annual Expenditures per Household for Main Space Heating (dollars) | 640 | 440 | 513 | 398 | 378 | 303 | 241 | 251 | 445 | 333 |
| Annual Heating Degree-Days (degree-days) | 5,749 | 6,058 | 6,586 | 6,684 | 3,277 | 2,974 | 3,161 | 3,888 | 4,869 | 4,598 |
| Average Heated Floor Space (square feet) | 1,718 | 1,846 | 1,808 | 2,287 | 1,530 | 1,822 | 1,508 | 1,839 | 1,657 | 1,952 |
| Consumption per 1,000 Square Foot * HDD (cubic feet) | 8.4 | 4.9 | 7.8 | 4.6 | 12.1 | 8.6 | 9.1 | 6.6 | 9.0 | 6.0 |
| Expenditures per 1,000 Square Foot * HDD (cents) | 6.5 | 3.9 | 4.3 | 2.6 | 7.5 | 5.6 | 5.1 | 3.5 | 5.5 | 3.7 |
| **Electricity [2]** | | | | | | | | | | |
| Households Using Electricity as Main Space Heating Source (million) | 1.3 | 0.7 | 1.7 | 1.2 | 7.5 | 7.1 | 3.8 | 1.8 | 14.3 | 10.7 |
| Annual Consumption per Household for Main Space Heating (kWh) | 5,492 | 6,137 | 8,215 | 5,571 | 4,395 | 3,638 | 4,632 | 3,127 | 5,001 | 3,928 |
| Annual Expenditures per Household for Main Space Heating (dollars) | 527 | 557 | 589 | 376 | 311 | 271 | 279 | 214 | 354 | 291 |
| Annual Heating Degree-Days (degree-days) | 6,026 | 6,076 | 6,445 | 5,994 | 2,451 | 2,434 | 3,943 | 3,008 | 3,633 | 3,157 |
| Average Heated Floor Space (square feet) | 1,368 | 1,536 | 1,695 | 1,407 | 1,390 | 1,527 | 1,124 | 1,294 | 1,352 | 1,476 |
| Consumption per 1,000 Square Foot * HDD (kWh) | 0.67 | 0.66 | 0.75 | 0.66 | 1.29 | 0.98 | 1.05 | 0.80 | 1.02 | 0.84 |
| Expenditures per 1,000 Square Foot * HDD (cents) | 6.4 | 6.0 | 5.4 | 4.5 | 9.1 | 7.3 | 6.3 | 5.5 | 7.2 | 6.2 |
| **Distillate Fuel Oil** | | | | | | | | | | |
| Households Using Oil as Main Space Heating Source (million) | 6.3 | 0.7 | 1.3 | W | 1.4 | W | 0.4 | W | 9.4 | 0.8 |
| Annual Consumption per Household for Main Space Heating (gallons) | 653 | 555 | 690 | W | 515 | W | 535 | W | 633 | 532 |
| Annual Expenditures per Household for Main Space Heating (dollars) | 586 | 505 | 592 | W | 494 | W | 543 | W | 571 | 483 |
| Annual Heating Degree-Days (degree-days) | 5,926 | 6,511 | 7,747 | W | 3,852 | W | 5,380 | W | 5,841 | 6,322 |
| Average Heated Floor Space (square feet) | 1,813 | 2,282 | 2,246 | W | 1,846 | W | 2,009 | W | 1,885 | 2,222 |
| Consumption per 1,000 Square Foot * HDD (gallons) | 0.06 | 0.04 | 0.04 | W | 0.07 | W | 0.05 | W | 0.06 | 0.04 |
| Expenditures per 1,000 Square Foot * HDD (cents) | 5.5 | 3.4 | 3.4 | W | 6.9 | W | 5.0 | W | 5.2 | 3.4 |
| **Liquefied Petroleum Gases (LPG)** | | | | | | | | | | |
| Households Using LPG as Main Space Heating Source (million) | W | 0.1 | 1.4 | 0.3 | 1.8 | 0.5 | 0.2 | 0.1 | 3.5 | 1.1 |
| Annual Consumption per Household for Main Space Heating (gallons) | W | 608 | 1,001 | 707 | 425 | 435 | 867 | 432 | 692 | 541 |
| Annual Expenditures per Household for Main Space Heating (dollars) | W | 609 | 762 | 564 | 406 | 417 | 791 | 426 | 581 | 489 |
| Annual Heating Degree-Days (degree-days) | W | 7,075 | 6,939 | 6,884 | 2,827 | 3,033 | 6,452 | 4,552 | 4,824 | 4,930 |
| Average Heated Floor Space (square feet) | W | 1,667 | 2,134 | 1,938 | 1,291 | 1,456 | 1,599 | 1,399 | 1,646 | 1,624 |
| Consumption per 1,000 Square Foot * HDD (gallons) | W | 0.05 | 0.07 | 0.05 | 0.12 | 0.10 | 0.08 | 0.07 | 0.09 | 0.07 |
| Expenditures per 1,000 Square Foot * HDD (cents) | W | 5.2 | 5.1 | 4.2 | 11.1 | 9.4 | 7.7 | 6.7 | 7.3 | 6.1 |

[1] See Appendix F for Census regions.

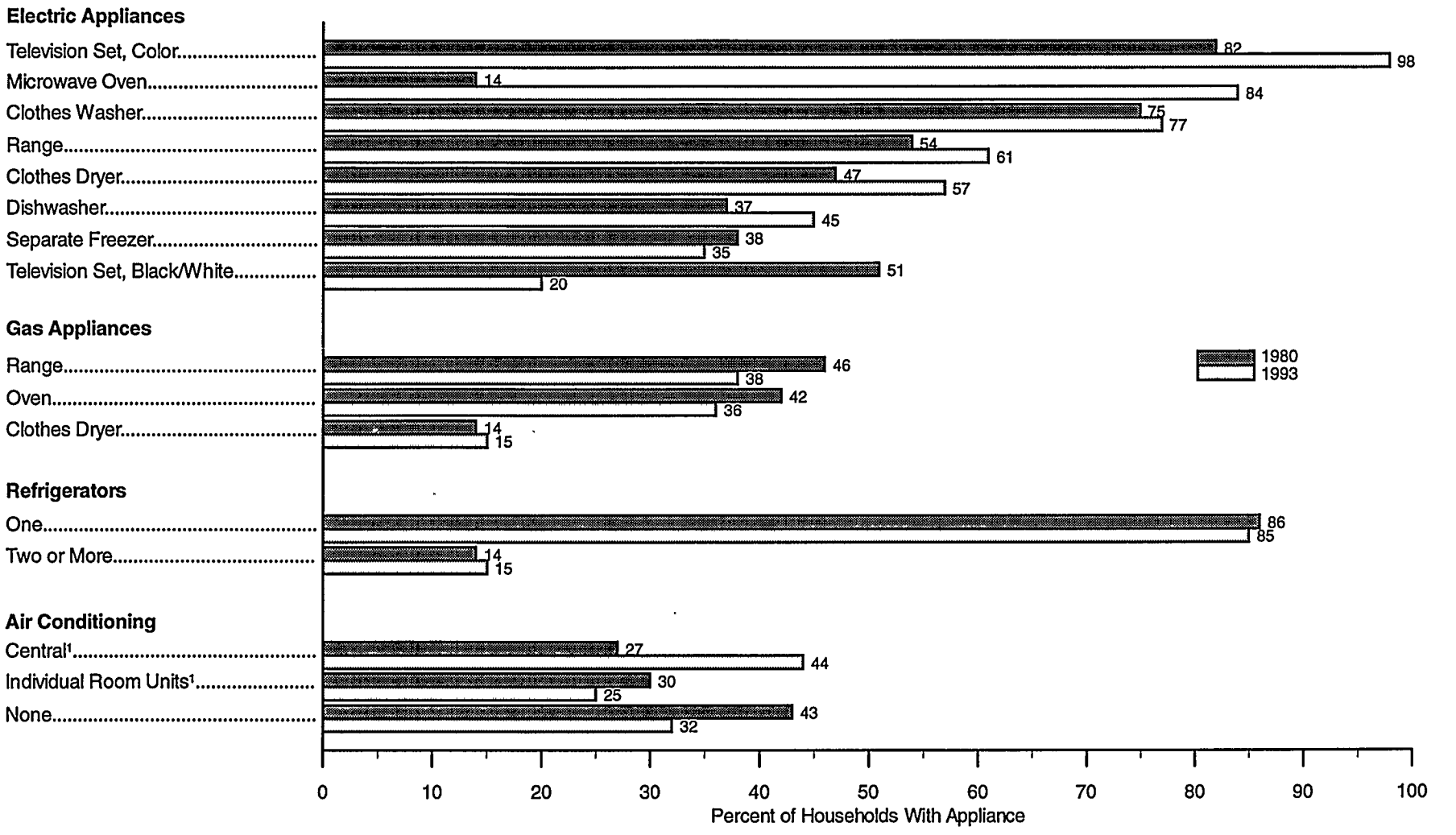
[2] Includes electricity generated for distribution from geothermal, wood, waste, wind, photovoltaic, and solar thermal energy sources.

W=Data withheld because fewer than 10 housing units were sampled.

Notes: • HDD = heating degree-days to base 65 °F. • One Btu of electricity = 0.000293 (1 ÷ 3,412) kWh. • Averages are for households using the fuel as the main space heating fuel. Space heating consumption and expenditures in this table do not show the small amounts of fuel used by households that use the fuel only as a secondary space heating fuel. • Space heating does not include electricity used by the fan that circulates warm air through the ducts. • HDD are for 1993.

Source: Energy Information Administration, Form EIA-457, "Residential Energy Consumption Survey."

## Figure 2.12 Households With Selected Appliances, 1980 and 1993




[1] Households with both central and individual room units are counted only under "central."

Source: Table 2.12.

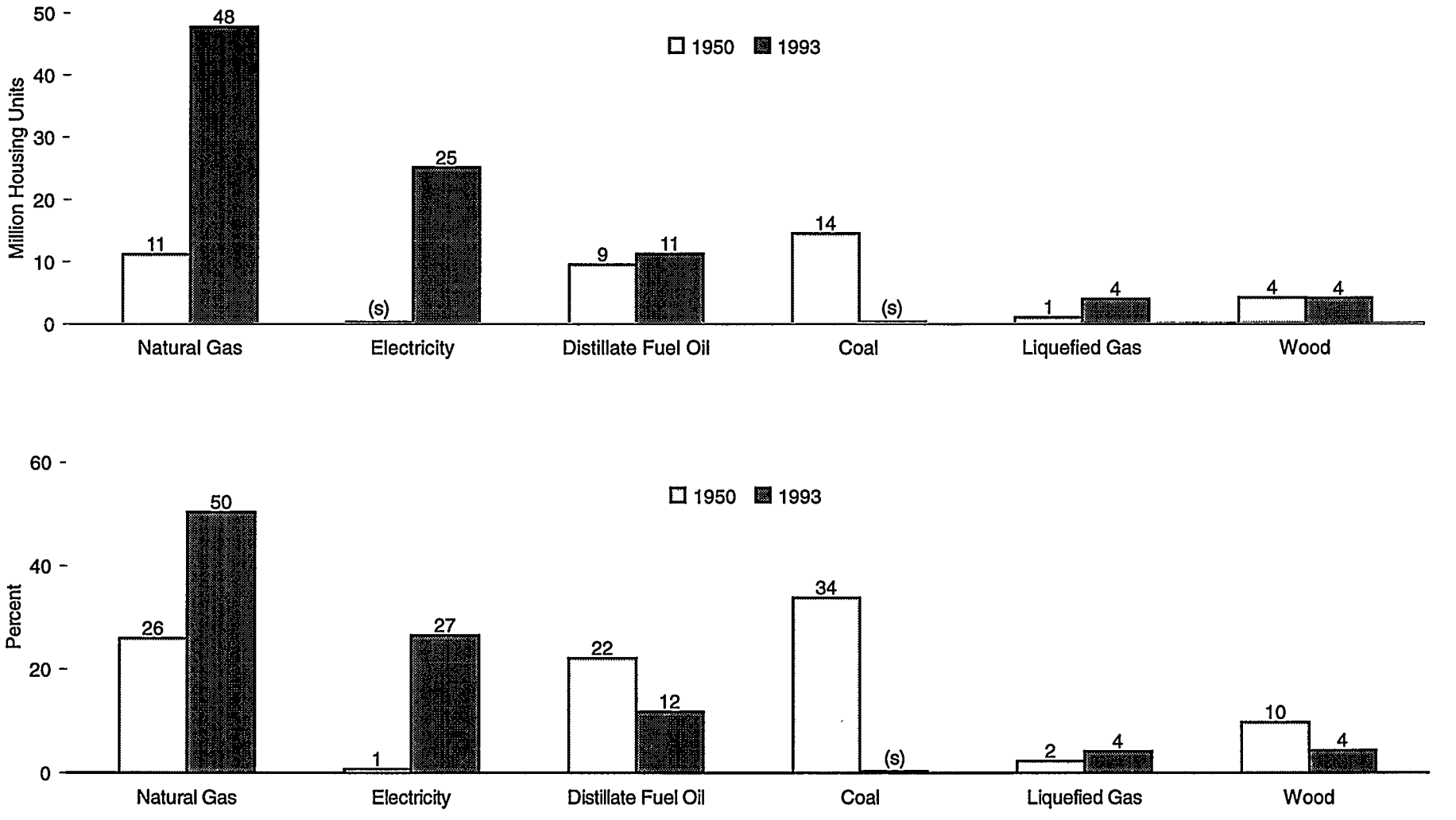
# Table 2.12 Households With Selected Appliances, Selected Years, 1978-1993

| Appliance | Percent of Households | | | | | | | | | Change |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1978 | 1979 | 1980 | 1981 | 1982 | 1984 | 1987 | 1990 | 1993 | 1980 to 1993 |
| **Total Households** | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | — |
| **Type of Appliances** | | | | | | | | | | |
| **Electric Appliances** | | | | | | | | | | |
| Television Set (Color) | NA | NA | 82 | 82 | 85 | 88 | 93 | 96 | 98 | 16 |
| Television Set (B/W) | NA | NA | 51 | 48 | 47 | 43 | 36 | 31 | 20 | -31 |
| Clothes Washer | 75 | NA | 75 | 74 | 72 | 74 | 76 | 76 | 77 | 2 |
| Range (Stove-Top Burner) | 53 | NA | 54 | 54 | 53 | 54 | 57 | 58 | 61 | 7 |
| Oven, Regular or Microwave | 54 | NA | 59 | 58 | 59 | 63 | 79 | 88 | 91 | 32 |
| Oven, Microwave | 8 | NA | 14 | 17 | 21 | 34 | 61 | 79 | 84 | 70 |
| Clothes Dryer | 45 | NA | 47 | 45 | 45 | 46 | 51 | 53 | 57 | 10 |
| Separate Freezer | 35 | NA | 38 | 38 | 37 | 37 | 34 | 35 | 35 | -3 |
| Dishwasher | 35 | NA | 37 | 37 | 36 | 38 | 43 | 45 | 45 | 8 |
| Dehumidifier | NA | NA | 9 | 9 | 9 | 9 | 10 | 12 | 9 | (s) |
| Waterbed Heaters | NA | NA | NA | NA | NA | 10 | 14 | 15 | 12 | NA |
| Window or Ceiling Fan | NA | NA | NA | NA | 28 | 35 | 46 | 51 | 60 | NA |
| Whole House Fan | NA | NA | NA | NA | 8 | 8 | 9 | 10 | 4 | NA |
| Evaporative Cooler | NA | NA | 4 | 4 | 4 | 4 | 3 | 4 | 3 | -1 |
| Personal Computer | NA | NA | NA | NA | NA | NA | NA | 16 | 23 | NA |
| Pump for Well Water | NA | NA | NA | NA | NA | NA | NA | 15 | 13 | NA |
| Swimming-Pool Pump [1] | NA | NA | 4 | 4 | 3 | NA | NA | 5 | 5 | 1 |
| **Gas Appliances** [2] | | | | | | | | | | |
| Range (Stove-Top or Burner) | 48 | NA | 46 | 46 | 47 | 45 | 43 | 42 | 38 | -8 |
| Oven | 47 | NA | 42 | 40 | 42 | 42 | 41 | 41 | 36 | -6 |
| Clothes Dryer | 14 | NA | 14 | 16 | 15 | 16 | 15 | 16 | 15 | 1 |
| Outdoor Gas Grill | NA | NA | 9 | 9 | 11 | 13 | 20 | 26 | 29 | 20 |
| Outdoor Gas Light | 2 | NA | 2 | 2 | 2 | 1 | 1 | 1 | 1 | -1 |
| Swimming Pool Heater [3] | NA | NA | NA | NA | NA | 1 | 1 | 2 | 1 | NA |
| **Refrigerators** [4] | | | | | | | | | | |
| One | 86 | NA | 86 | 87 | 86 | 88 | 86 | 84 | 85 | -1 |
| Two or More | 14 | NA | 14 | 13 | 13 | 12 | 14 | 15 | 15 | 1 |
| **Air Conditioning (A/C)** | | | | | | | | | | |
| Central [5] | 23 | 24 | 27 | 27 | 28 | 30 | 36 | 39 | 44 | 17 |
| Individual Room Units [5] | 33 | 31 | 30 | 31 | 30 | 30 | 30 | 29 | 25 | -5 |
| None | 44 | 45 | 43 | 42 | 42 | 40 | 36 | 32 | 32 | -11 |
| **Portable Kerosene Heaters** | (s) | NA | (s) | 1 | 3 | 6 | 6 | 5 | 2 | 2 |

[1] All reported swimming pools were assumed to have an electric pump for filtering and circulating the water, except for 1993 when a filtering system was made explicit.
[2] Includes natural gas or liquefied petroleum gases.
[3] In 1984 and 1987, also includes heaters for jacuzzis and hot tubs.
[4] Fewer than 0.5 percent of the households do not have a refrigerator.
[5] Households with both central and individual room units are counted only under "Central."

NA=Not available. — = Not applicable. (s)=Less than 0.5 percent.
Note: No data are available for years not shown.
Sources: • 1978 and 1979—Energy Information Administration (EIA), Form EIA-84, "Residential Energy Consumption Survey." • 1980 forward—EIA, Form EIA-457, "Residential Energy Consumption Survey."

## Figure 2.13 Type of Heating in Occupied Housing Units, 1950 and 1993




(s)=Less than 0.5.

Source: Table 2.13.

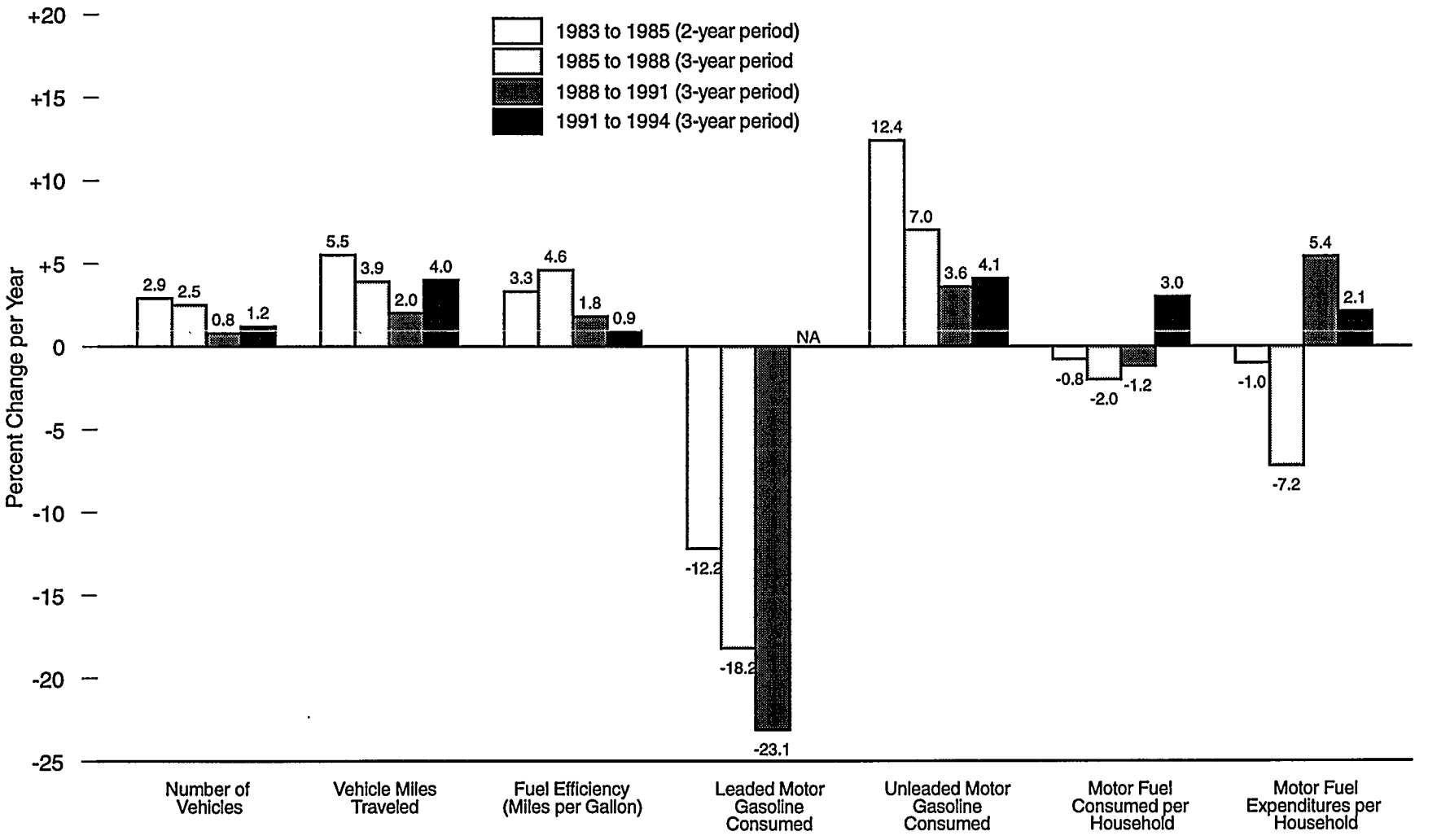
# Table 2.13 Type of Heating in Occupied Housing Units, Selected Years, 1950-1993

| Year | Coal [1] | Natural Gas | Liquefied Gas | Distillate Fuel Oil | Kerosene | Electricity | Wood | Solar | Other | None [2] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Million | | | | | | | | | | |
| 1950 | 14.48 | 11.12 | 0.98 | 9.46 | ([3]) | 0.28 | 4.17 | NA | 0.77 | 1.57 | 42.83 |
| 1960 | 6.46 | 22.85 | 2.69 | 17.16 | ([3]) | 0.93 | 2.24 | NA | 0.22 | 0.48 | 53.02 |
| 1970 | 1.82 | 35.01 | 3.81 | 16.47 | ([3]) | 4.88 | 0.79 | NA | 0.27 | 0.40 | 63.45 |
| 1973 | 0.80 | 38.46 | 4.42 | 17.24 | ([3]) | 7.21 | 0.60 | NA | 0.15 | 0.45 | 69.34 |
| 1974 | 0.74 | 39.47 | 4.14 | 16.84 | ([3]) | 8.41 | 0.66 | NA | 0.09 | 0.48 | 70.83 |
| 1975 | 0.57 | 40.93 | 4.15 | 16.30 | ([3]) | 9.17 | 0.85 | NA | 0.08 | 0.47 | 72.52 |
| 1976 | 0.48 | 41.22 | 4.24 | 16.45 | ([3]) | 10.15 | 0.91 | NA | 0.09 | 0.46 | 74.01 |
| 1977 | 0.45 | 41.54 | 4.18 | 15.62 | 0.44 | 11.15 | 1.24 | NA | 0.15 | 0.51 | 75.28 |
| 1978 | 0.40 | 42.52 | 4.13 | 15.65 | 0.42 | 12.26 | 1.07 | NA | 0.12 | 0.60 | 77.17 |
| 1979 | 0.36 | 43.32 | 4.13 | 15.30 | 0.41 | 13.24 | 1.14 | NA | 0.10 | 0.57 | 78.57 |
| 1980 | 0.33 | 44.40 | 4.17 | 14.50 | 0.37 | 14.21 | 1.38 | NA | 0.11 | 0.61 | 80.07 |
| 1981 | 0.36 | 46.08 | 4.17 | 14.13 | 0.37 | 15.49 | 1.89 | NA | 0.10 | 0.59 | 83.18 |
| 1983 [4] | 0.43 | 46.70 | 3.87 | 12.59 | 0.45 | 15.68 | 4.09 | NA | 0.16 | 0.68 | 84.64 |
| 1985 | 0.45 | 45.33 | 3.58 | 12.44 | 1.06 | 18.36 | 6.25 | 0.05 | 0.37 | 0.53 | 88.43 |
| 1987 | 0.41 | 45.96 | 3.66 | 12.74 | 1.08 | 20.61 | 5.45 | 0.05 | 0.28 | 0.66 | 90.89 |
| 1989 | 0.34 | 47.40 | 3.66 | 12.47 | 1.07 | 23.06 | 4.59 | (s) | 0.40 | 0.66 | 93.68 |
| 1991 | 0.32 | 47.02 | 3.88 | 11.47 | 0.99 | 23.71 | 4.44 | (s) | 0.41 | 0.86 | 93.15 |
| 1993 | 0.30 | 47.67 | 3.92 | 11.17 | 1.02 | 25.11 | 4.10 | (s) | 0.50 | 0.91 | 94.73 |
| | Percent | | | | | | | | | | |
| 1950 | 33.8 | 26.0 | 2.3 | 22.1 | ([3]) | 0.6 | 9.7 | NA | 1.8 | 3.7 | 100.0 |
| 1960 | 12.2 | 43.1 | 5.1 | 32.4 | ([3]) | 1.8 | 4.2 | NA | 0.4 | 0.9 | 100.0 |
| 1970 | 2.9 | 55.2 | 6.0 | 26.0 | ([3]) | 7.7 | 1.3 | NA | 0.4 | 0.6 | 100.0 |
| 1973 | 1.2 | 55.5 | 6.4 | 24.9 | ([3]) | 10.4 | 0.9 | NA | 0.2 | 0.7 | 100.0 |
| 1974 | 1.0 | 55.7 | 5.8 | 23.8 | ([3]) | 11.9 | 0.9 | NA | 0.1 | 0.7 | 100.0 |
| 1975 | 0.8 | 56.4 | 5.7 | 22.5 | ([3]) | 12.6 | 1.2 | NA | 0.1 | 0.6 | 100.0 |
| 1976 | 0.7 | 55.7 | 5.7 | 22.2 | ([3]) | 13.7 | 1.2 | NA | 0.1 | 0.6 | 100.0 |
| 1977 | 0.6 | 55.2 | 5.6 | 20.7 | 0.6 | 14.8 | 1.6 | NA | 0.2 | 0.7 | 100.0 |
| 1978 | 0.5 | 55.1 | 5.4 | 20.3 | 0.5 | 15.9 | 1.4 | NA | 0.2 | 0.8 | 100.0 |
| 1979 | 0.5 | 55.1 | 5.3 | 19.5 | 0.5 | 16.9 | 1.4 | NA | 0.1 | 0.7 | 100.0 |
| 1980 | 0.4 | 55.4 | 5.2 | 18.1 | 0.5 | 17.7 | 1.7 | NA | 0.1 | 0.8 | 100.0 |
| 1981 | 0.4 | 55.4 | 5.0 | 17.0 | 0.4 | 18.6 | 2.3 | NA | 0.1 | 0.7 | 100.0 |
| 1983 [4] | 0.5 | 55.2 | 4.6 | 14.9 | 0.5 | 18.5 | 4.8 | NA | 0.2 | 0.8 | 100.0 |
| 1985 | 0.5 | 51.3 | 4.1 | 14.1 | 1.2 | 20.8 | 7.1 | 0.1 | 0.4 | 0.6 | 100.0 |
| 1987 | 0.4 | 50.6 | 4.0 | 14.0 | 1.2 | 22.7 | 6.0 | 0.1 | 0.3 | 0.7 | 100.0 |
| 1989 | 0.4 | 50.6 | 3.9 | 13.3 | 1.1 | 24.6 | 4.9 | (s) | 0.4 | 0.7 | 100.0 |
| 1991 | 0.3 | 50.5 | 4.2 | 12.3 | 1.1 | 25.5 | 4.8 | (s) | 0.4 | 0.9 | 100.0 |
| 1993 | 0.3 | 50.3 | 4.1 | 11.8 | 1.1 | 26.5 | 4.3 | (s) | 0.5 | 1.0 | 100.0 |

[1] Includes coal coke.
[2] Includes nonreporting units in 1950 and 1960, which totaled 997 and 2,000 units, respectively.
[3] Included in distillate fuel oil.
[4] Since 1983, the *American Housing Survey for the United States* has been a biennial survey.
NA=Not available. (s)=Less than 0.05 million or less than 0.05 percent.

Notes: • Includes mobile homes and individual housing units in apartment buildings. Housing units with more than one type of heating system are classified according to the principal type of heating system. • Totals may not equal sum of components due to independent rounding.
Sources: • 1950, 1960, and 1970—Bureau of the Census, *Census of Population and Housing.* • 1973 forward—Bureau of the Census, *American Housing Survey for the United States in 1993,* Table 2-5.

## Figure 2.14 Household Motor Vehicle Data




Note: The percent changes are of all income categories; they are simple average annual percent changes (computed as the 3-year percent change divided by 3) and will differ slightly from compound average annual percent changes.

NA=Not Available.
Source: Table 2.14.

# Table 2.14 Household Motor Vehicle Data, 1983, 1985, 1988, 1991, and 1994

| Unit of Measure | Family Income | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Less than $25,000 | | | | | $25,000 or More | | | | | All Income Categories | | | | |
| | 1983 | 1985 | 1988 | 1991 | 1994 | 1983 | 1985 | 1988 | 1991 | 1994 | 1983 | 1985 | 1988 | 1991 | 1994 |
| Households with Vehicles (millions) | 42.9 | 43.3 | 38.9 | 36.5 | 34.5 | 30.5 | 34.5 | 42.2 | 48.2 | 50.3 | 73.4 | 77.7 | 81.3 | 84.6 | 84.9 |
| Vehicles (millions) | 66.7 | 65.4 | 58.7 | 52.7 | 52.0 | 63.0 | 71.9 | 88.8 | 98.5 | 104.8 | 129.7 | 137.3 | 147.5 | 151.2 | 156.8 |
| Vehicle Miles Traveled (billions) | 589 | 587 | 550 | 488 | 550.4 | 630 | 766 | 960 | 1,114 | 1,242.8 | 1,219 | 1,353 | 1,511 | 1,602 | 1,793 |
| Motor Fuel Consumed (billion gallons) | 40.8 | 38.2 | 31.4 | 26.9 | 28.3 | 39.8 | 45.7 | 51.0 | 55.9 | 62.3 | 80.5 | 83.9 | 82.4 | 82.8 | 90.6 |
| Motor Gasoline Consumed (billion gallons) | | | | | | | | | | | | | | | |
| Leaded | 19.2 | 13.5 | 5.4 | 1.8 | Q | 13.2 | 11.0 | 5.8 | 1.6 | Q | 32.4 | 24.5 | 11.1 | 3.4 | Q |
| Unleaded | 20.9 | 24.2 | 25.7 | 24.7 | 26.7 | 25.3 | 33.7 | 44.3 | 52.9 | 60.3 | 46.3 | 57.8 | 69.9 | 77.5 | 87.0 |
| Motor Fuel Expenditures (billion dollars[1]) | 48.1 | 44.8 | 30.7 | 31.7 | 32.6 | 47.3 | 54.3 | 50.3 | 66.6 | 72.1 | 95.4 | 99.1 | 81.1 | 98.2 | 104.7 |
| Averages per Household with Vehicles | | | | | | | | | | | | | | | |
| Vehicles | 1.6 | 1.5 | 1.5 | 1.4 | 1.5 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 1.8 | 1.8 | 1.8 | 1.8 | 1.8 |
| Vehicle Miles Traveled (thousands) | 13.7 | 13.6 | 14.1 | 13.4 | 15.9 | 20.7 | 22.2 | 22.7 | 23.1 | 24.7 | 16.6 | 17.4 | 18.6 | 18.9 | 21.1 |
| Motor Fuel Consumed (gallons) | 950 | 883 | 807 | 737 | 818 | 1,305 | 1,326 | 1,205 | 1,160 | 1,238 | 1,097 | 1,079 | 1,014 | 979 | 1,067 |
| Motor Fuel Expenditures (dollars[1]) | 1,121 | 1,035 | 789 | 869 | 943 | 1,552 | 1,575 | 1,191 | 1,382 | 1,433 | 1,300 | 1,274 | 998 | 1,161 | 1,234 |
| Averages per Vehicle | | | | | | | | | | | | | | | |
| Vehicle Miles Traveled (thousands) | 8.8 | 9.0 | 9.4 | 9.3 | 10.6 | 10.0 | 10.7 | 10.8 | 11.3 | 11.9 | 9.4 | 9.9 | 10.3 | 10.6 | 11.4 |
| Motor Fuel Consumed (gallons) | 612 | 585 | 536 | 510 | 545 | 631 | 636 | 574 | 568 | 594 | 621 | 611 | 559 | 548 | 578 |
| Motor Fuel Expenditures (dollars[1]) | 722 | 685 | 524 | 602 | 628 | 751 | 755 | 567 | 676 | 688 | 736 | 722 | 550 | 650 | 668 |
| Fuel Efficiency (miles per gallon) | 14.4 | 15.3 | 17.5 | 18.1 | 19.5 | 15.8 | 16.8 | 18.8 | 19.9 | 20.0 | 15.1 | 16.1 | 18.3 | 19.3 | 19.8 |
| Price of Motor Gasoline (dollars[1] per gallon) | | | | | | | | | | | | | | | |
| Leaded | 1.14 | 1.11 | 0.90 | 1.10 | Q | 1.14 | 1.11 | 0.90 | 1.10 | Q | 1.14 | 1.11 | 0.90 | 1.10 | Q |
| Unleaded | 1.22 | 1.20 | 0.99 | 1.18 | 1.15 | 1.22 | 1.21 | 1.00 | 1.19 | 1.16 | 1.22 | 1.21 | 1.00 | 1.19 | 1.16 |

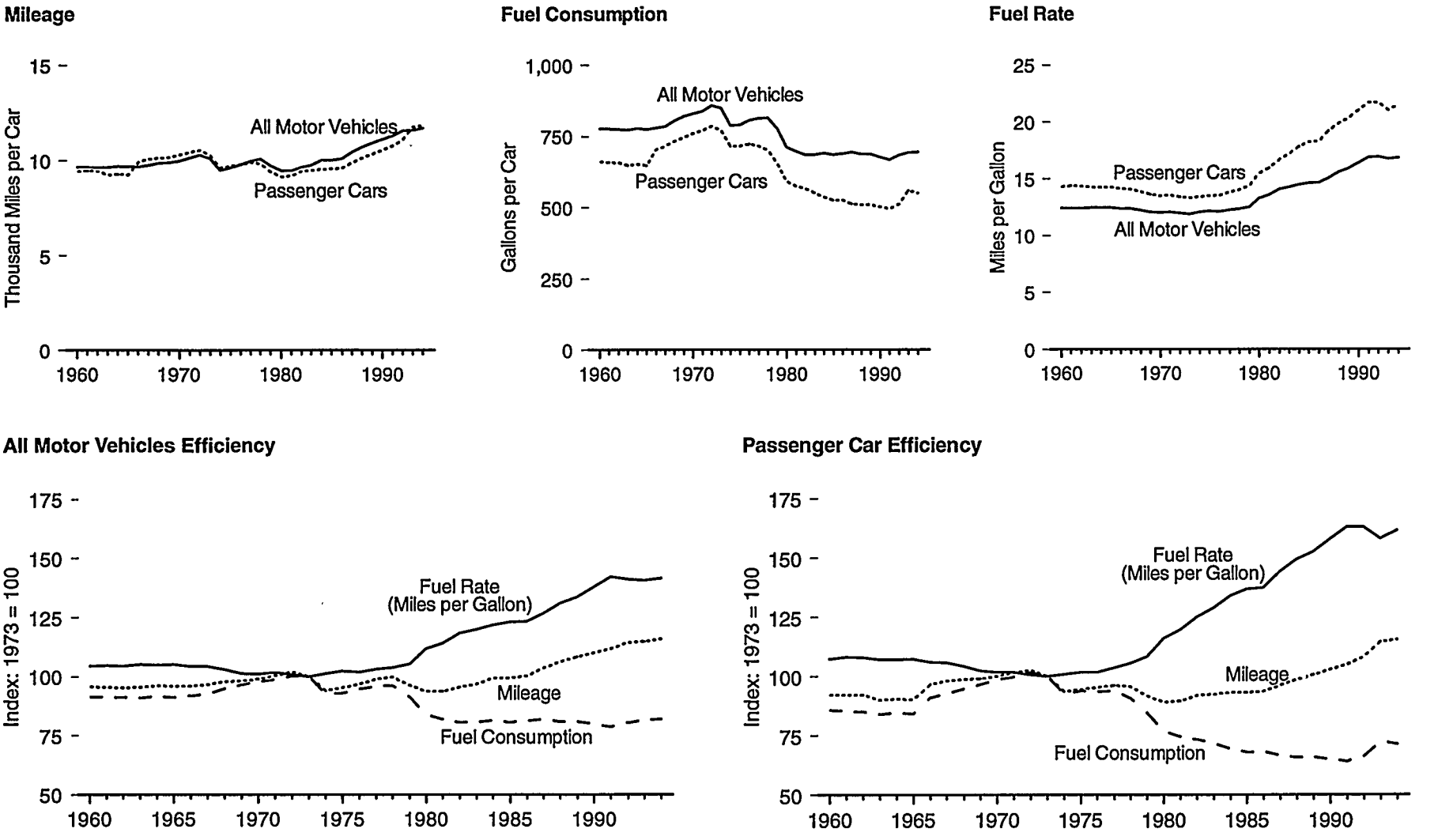
[1] Nominal dollars.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 10 households were sampled.

Notes: • Included are automobiles, station wagons, passenger vans, cargo vans, motor homes, pickup trucks, and sport-utility vehicles (i.e., jeeplike vehicles, usually four-wheel drive). Excluded are motorcycles, mopeds, large trucks, and buses. • Motor fuel includes motor gasoline and a small amount of other fuels, such as diesel, gasohol, and propane. These data for 1983 differ from previously published 1983 data in that the basis for estimating the number of vehicle-owning households was changed to conform with that being used for 1985. Purchase diaries, which were fuel purchase logs retained by drivers in 1983 and 1985, were used as the basis for estimating data for those years. • Totals may not equal sum of components due to independent rounding.

Sources: **Fuel Efficiency:** • 1983 and 1985—Energy Information Administration (EIA), "Residential Transportation Energy Consumption Survey" purchase diaries. • 1988 through 1994—Environmental Protection Agency Certification Files, adjusted for on-road driving. **Price of Motor Gasoline:** • 1983 and 1985—EIA, "Residential Transportation Energy Consumption Survey" purchase diaries. • 1988 through 1994—Bureau of Labor Statistics Gasoline Pump Price Series and Lundberg Inc. price series. **All Other Data:** EIA, Form EIA-876A/C, "Residential Transportation Energy Consumption Survey."

## Figure 2.15 Motor Vehicle Efficiency, 1960-1994




Source: Table 2.15.

# Table 2.15 Motor Vehicle Efficiency, 1960-1994

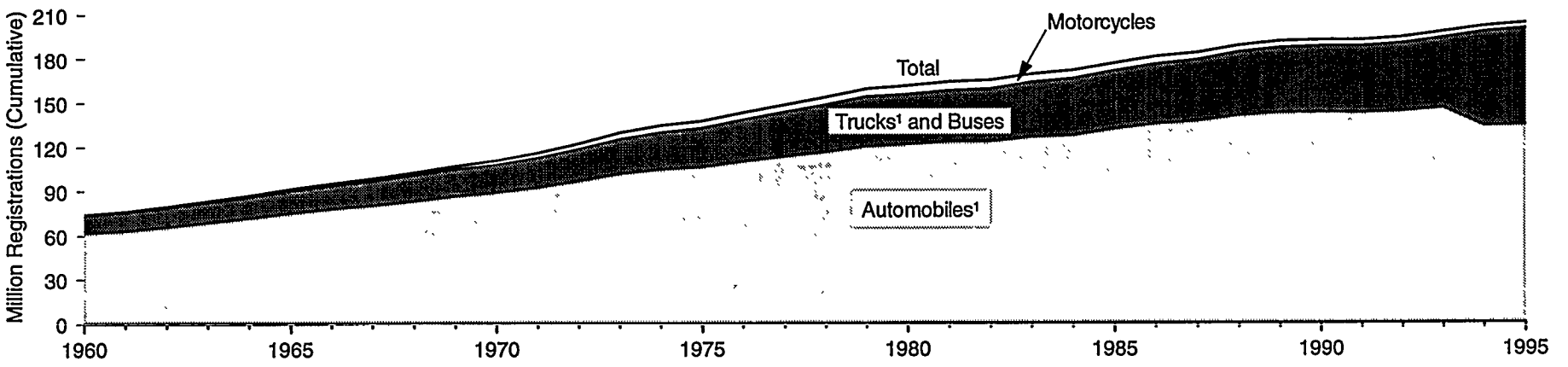
| Year | Passenger Cars [1] | | | | | | All Motor Vehicles [2] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mileage | | Fuel Consumption | | Fuel Rate | | Mileage | | Fuel Consumption | | Fuel Rate | |
| | Miles per Car | Index 1973 = 100.0 | Gallons per Car | Index 1973 = 100.0 | Miles per Gallon | Index 1973 = 100.0 | Miles per Vehicle | Index 1973 = 100.0 | Gallons per Vehicle | Index 1973 = 100.0 | Miles per Gallon | Index 1973 = 100.0 |
| 1960 | 9,446 | 92.1 | 661 | 85.7 | 14.28 | 107.4 | 9,652 | 95.6 | 777 | 91.4 | 12.42 | 104.4 |
| 1961 | 9,465 | 92.3 | 658 | 85.3 | 14.38 | 108.1 | 9,648 | 95.5 | 776 | 91.3 | 12.44 | 104.6 |
| 1962 | 9,441 | 92.1 | 657 | 85.2 | 14.37 | 108.0 | 9,618 | 95.2 | 774 | 91.1 | 12.43 | 104.5 |
| 1963 | 9,240 | 90.1 | 648 | 84.0 | 14.26 | 107.2 | 9,646 | 95.5 | 773 | 90.9 | 12.48 | 105.0 |
| 1964 | 9,286 | 90.5 | 652 | 84.6 | 14.25 | 107.1 | 9,698 | 96.0 | 778 | 91.5 | 12.47 | 104.9 |
| 1965 | 9,255 | 90.2 | 649 | 84.2 | 14.27 | 107.3 | 9,674 | 95.8 | 775 | 91.2 | 12.48 | 105.0 |
| 1966 | 9,923 | 96.8 | 703 | 91.2 | 14.11 | 106.1 | 9,675 | 95.8 | 780 | 91.8 | 12.40 | 104.2 |
| 1967 | 10,060 | 98.1 | 715 | 92.7 | 14.07 | 105.8 | 9,751 | 96.6 | 786 | 92.5 | 12.40 | 104.2 |
| 1968 | 10,144 | 98.9 | 731 | 94.8 | 13.87 | 104.3 | 9,864 | 97.7 | 805 | 94.7 | 12.25 | 103.0 |
| 1969 | 10,158 | 99.0 | 746 | 96.8 | 13.62 | 102.4 | 9,885 | 97.9 | 821 | 96.6 | 12.05 | 101.3 |
| 1970 | 10,272 | 100.2 | 760 | 98.6 | 13.52 | 101.7 | 9,976 | 98.8 | 830 | 97.7 | 12.02 | 101.1 |
| 1971 | 10,422 | 101.6 | 770 | 99.9 | 13.54 | 101.8 | 10,133 | 100.3 | 839 | 98.7 | 12.08 | 101.6 |
| 1972 | 10,521 | 102.6 | 785 | 101.8 | 13.40 | 100.8 | 10,279 | 101.8 | 857 | 100.1 | 11.99 | 100.8 |
| 1973 | 10,256 | 100.0 | 771 | 100.0 | 13.30 | 100.0 | 10,099 | 100.0 | 850 | 100.0 | 11.89 | 100.0 |
| 1974 | 9,606 | 93.7 | 716 | 92.9 | 13.42 | 100.9 | 9,493 | 94.0 | 788 | 92.7 | 12.05 | 101.3 |
| 1975 | 9,690 | 94.5 | 716 | 93.9 | 13.52 | 101.7 | 9,627 | 95.3 | 790 | 92.9 | 12.18 | 102.4 |
| 1976 | 9,785 | 95.4 | 723 | 93.8 | 13.53 | 101.7 | 9,774 | 96.8 | 806 | 94.8 | 12.12 | 101.9 |
| 1977 | 9,879 | 96.3 | 716 | 93.9 | 13.80 | 103.8 | 9,978 | 98.8 | 814 | 95.8 | 12.26 | 103.1 |
| 1978 | 9,835 | 95.9 | 701 | 90.9 | 14.04 | 105.6 | 10,077 | 99.8 | 816 | 96.0 | 12.35 | 103.9 |
| 1979 | 9,403 | 91.7 | 653 | 84.7 | 14.41 | 108.3 | 9,722 | 96.3 | 776 | 91.3 | 12.52 | 105.3 |
| 1980 | 9,141 | 89.1 | 591 | 76.7 | 15.46 | 116.2 | 9,458 | 93.7 | 712 | 83.8 | 13.29 | 111.8 |
| 1981 | 9,186 | 89.6 | 576 | 74.7 | 15.94 | 119.8 | 9,462 | 93.7 | 697 | 82.0 | 13.57 | 114.1 |
| 1982 | 9,428 | 91.9 | 566 | 73.4 | 16.65 | 125.2 | 9,644 | 95.5 | 686 | 80.7 | 14.07 | 118.3 |
| 1983 | 9,475 | 92.4 | 553 | 71.7 | 17.14 | 128.9 | 9,761 | 96.7 | 686 | 80.7 | 14.24 | 119.8 |
| 1984 | 9,558 | 93.2 | 536 | 69.5 | 17.83 | 134.1 | 10,017 | 99.2 | 691 | 81.3 | 14.49 | 121.9 |
| 1985 | 9,560 | 93.2 | 525 | 68.1 | 18.20 | 136.8 | 10,018 | 99.2 | 685 | 80.6 | 14.62 | 123.0 |
| 1986 | 9,608 | 93.7 | 526 | 68.2 | 18.27 | 137.4 | 10,117 | 100.2 | 690 | 81.2 | 14.66 | 123.3 |
| 1987 | 9,878 | 96.3 | 514 | 66.7 | 19.20 | 144.4 | 10,449 | 103.5 | 694 | 81.6 | 15.07 | 126.7 |
| 1988 | 10,121 | 98.7 | 509 | 66.0 | 19.87 | 149.4 | 10,720 | 106.1 | 688 | 80.9 | 15.58 | 131.0 |
| 1989 | 10,332 | 100.7 | 509 | 66.0 | 20.31 | 152.7 | 10,936 | 108.3 | 688 | 80.9 | 15.90 | 133.7 |
| 1990 | 10,548 | 102.8 | 502 | 65.1 | 21.02 | 158.0 | 11,107 | 110.0 | 677 | 79.8 | 16.40 | 137.9 |
| 1991 | 10,757 | 104.9 | 496 | 64.3 | 21.69 | 163.1 | 11,294 | 111.8 | 668 | 78.6 | 16.90 | 142.1 |
| 1992 | 11,100 | 108.2 | 512 | 66.4 | 21.68 | 163.0 | 11,558 | 114.4 | 683 | 80.4 | 16.91 | 141.2 |
| 1993 | R11,759 | R114.7 | R559 | R72.5 | R21.04 | R158.2 | R11,597 | 114.8 | 693 | 81.5 | R16.73 | R140.7 |
| 1994P | 11,838 | 115.4 | 551 | 71.5 | 21.48 | 161.5 | 11,695 | 115.8 | 695 | 81.8 | 16.83 | 141.5 |

[1] From 1960 to 1965, passenger cars category also include motorcycles.
[2] Passenger cars, motorcycles, buses, and trucks.
R=Revised data. P=Preliminary data.

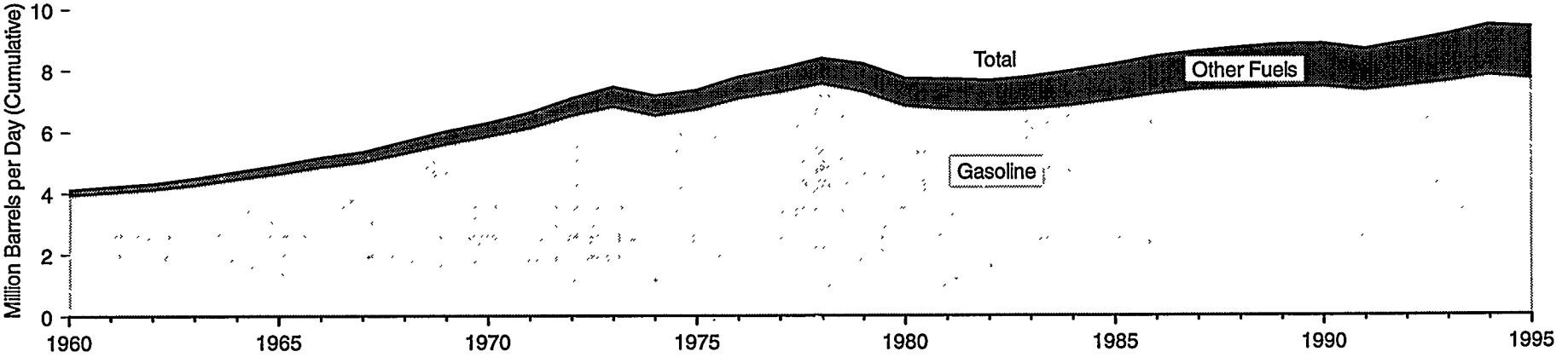
Sources: • 1960-1985—Federal Highway Administration, *Highway Statistics Summary to 1985*, Table VM-201A. • 1986 forward—Federal Highway Administration, *Highway Statistics*, annual, Table VM-1M.

# Figure 2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1995

**Motor Vehicle Registrations**




**Motor Fuel Consumption**




[1] Beginning with 1994, personal passenger vans, passenger minivans, and utility-type vehicles are included in "Trucks" instead of "Automobiles."

Source: Table 2.16.

# Table 2.16 Motor Vehicle Registrations and Motor Fuel Consumption, 1960-1995

| Year | Motor Vehicle Registrations (millions) | | | | | Motor Fuel Consumption [1] (thousand barrels per day) | | |
|---|---|---|---|---|---|---|---|---|
| | Automobiles | Motorcycles | Buses | Trucks | Total | Gasoline [2] | Other Fuels [3] | Total [4] |
| 1960 | 61.7 | 0.6 | 0.3 | 11.9 | 74.4 | 3,953 | 159 | 4,112 |
| 1961 | 63.4 | 0.6 | 0.3 | 12.3 | 76.6 | 4,034 | 176 | 4,210 |
| 1962 | 66.1 | 0.7 | 0.3 | 12.8 | 79.8 | 4,120 | 192 | 4,312 |
| 1963 | 69.0 | 0.8 | 0.3 | 13.4 | 83.5 | 4,274 | 211 | 4,485 |
| 1964 | 72.0 | 1.0 | 0.3 | 14.0 | 87.3 | 4,454 | 236 | 4,690 |
| 1965 | 75.3 | 1.4 | 0.3 | 14.8 | 91.7 | 4,644 | 269 | 4,913 |
| 1966 | 78.1 | 1.8 | 0.3 | 15.5 | 95.7 | 4,846 | 306 | 5,152 |
| 1967 | 80.4 | 2.0 | 0.3 | 16.2 | 98.9 | 5,014 | 329 | 5,343 |
| 1968 | 83.6 | 2.1 | 0.4 | 16.9 | 103.0 | 5,300 | 370 | 5,670 |
| 1969 | 86.9 | 2.3 | 0.4 | 17.9 | 107.4 | 5,604 | 413 | 6,017 |
| 1970 | 89.2 | 2.8 | 0.4 | 18.8 | 111.2 | 5,845 | 439 | 6,284 |
| 1971 | 92.7 | 3.3 | 0.4 | 19.9 | 116.3 | 6,125 | 494 | 6,619 |
| 1972 | 97.1 | 3.8 | 0.4 | 21.3 | 122.6 | 6,529 | 554 | 7,083 |
| 1973 | 102.0 | 4.4 | 0.4 | 23.2 | 130.0 | 6,819 | 642 | 7,460 |
| 1974 | 104.9 | 5.0 | 0.4 | 24.6 | 134.9 | 6,531 | 639 | 7,170 |
| 1975 | 106.7 | 5.0 | 0.5 | 25.8 | 137.9 | 6,719 | 628 | 7,347 |
| 1976 | 110.4 | 5.0 | 0.5 | 27.7 | 143.5 | 7,075 | 697 | 7,772 |
| 1977 | 113.7 | 5.0 | 0.5 | 29.6 | 148.8 | 7,287 | 760 | 8,046 |
| 1978 | 116.6 | 5.1 | 0.5 | 31.7 | 153.9 | 7,555 | 837 | 8,392 |
| 1979 | 120.2 | 5.5 | 0.5 | 33.3 | 159.6 | 7,291 | 913 | 8,204 |
| 1980 | 121.7 | 5.7 | 0.5 | 33.6 | 161.6 | 6,820 | 896 | 7,716 |
| 1981 | 123.5 | 5.8 | 0.5 | 34.5 | 164.3 | 6,726 | 969 | 7,695 |
| 1982 | 123.7 | 5.7 | 0.6 | 35.3 | 165.3 | 6,679 | 972 | 7,651 |
| 1983 | 126.7 | 5.6 | 0.6 | 36.5 | 169.4 | 6,731 | 1,043 | 7,774 |
| 1984 | 127.9 | 5.5 | 0.6 | 38.0 | 172.0 | 6,850 | 1,127 | 7,977 |
| 1985 | 132.1 | 5.4 | ([5]) | 39.6 | 177.1 | 7,020 | 1,158 | 8,178 |
| 1986 | 135.4 | 5.3 | ([5]) | 40.8 | 181.5 | 7,229 | 1,202 | 8,431 |
| 1987 | 137.3 | 4.9 | ([5]) | 41.7 | 183.9 | 7,359 | 1,242 | 8,601 |
| 1988 | 141.3 | 4.6 | ([5]) | 43.1 | 189.0 | 7,405 | 1,306 | 8,711 |
| 1989 | 143.1 | 4.4 | ([5]) | 44.2 | 191.7 | 7,437 | 1,385 | 8,822 |
| 1990 | 143.5 | 4.3 | ([5]) | 45.1 | 192.9 | 7,454 | 1,396 | 8,849 |
| 1991 | 143.0 | 4.2 | ([5]) | 45.4 | 192.5 | 7,323 | 1,349 | 8,672 |
| 1992 | 144.2 | 4.1 | ([5]) | 46.1 | 194.4 | 7,472 | 1,430 | 8,902 |
| 1993 | 146.3 | 4.0 | ([5]) | 47.7 | 198.0 | 7,607 | 1,534 | 9,141 |
| 1994 | [R,6]133.9 | [R]3.7 | ([5]) | [R,6]64.1 | [R]201.8 | [R]7,807 | [R]1,639 | [R]9,446 |
| 1995[E] | 135.0 | 3.7 | ([5]) | 65.5 | 204.1 | 7,694 | 1,680 | 9,374 |

[1] Includes only motor fuel taxed at the prevailing tax rates in each State. Excludes motor fuel exempt from tax payment, subject to tax refund, or taxed at rates other than the prevailing tax rate. Experience has shown that the total motor fuel consumption quantity cited here equals more than 99.0 percent of gross reported motor fuel consumption.

[2] Motor gasoline, aviation gasoline, and gasohol.

[3] Distillate fuel oil (diesel oil), liquefied gases, and kerosene when they are used to operate vehicles on highways. Excludes jet fuel beginning in 1962.

[4] Excludes losses allowed for evaporation, handling, etc.

[5] Included in trucks.

[6] Beginning with 1994, personal passenger vans, passenger minivans, and utility-type vehicles are included in "Trucks" instead of "Automobiles."

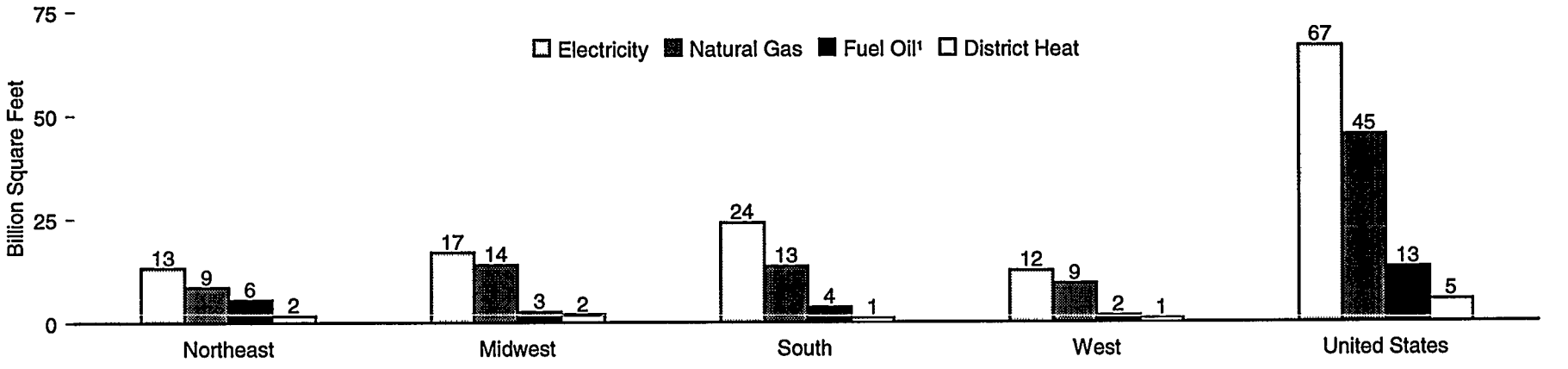
R=Revised data. E=Estimate.

Note: Totals may not equal sum of components due to independent rounding.

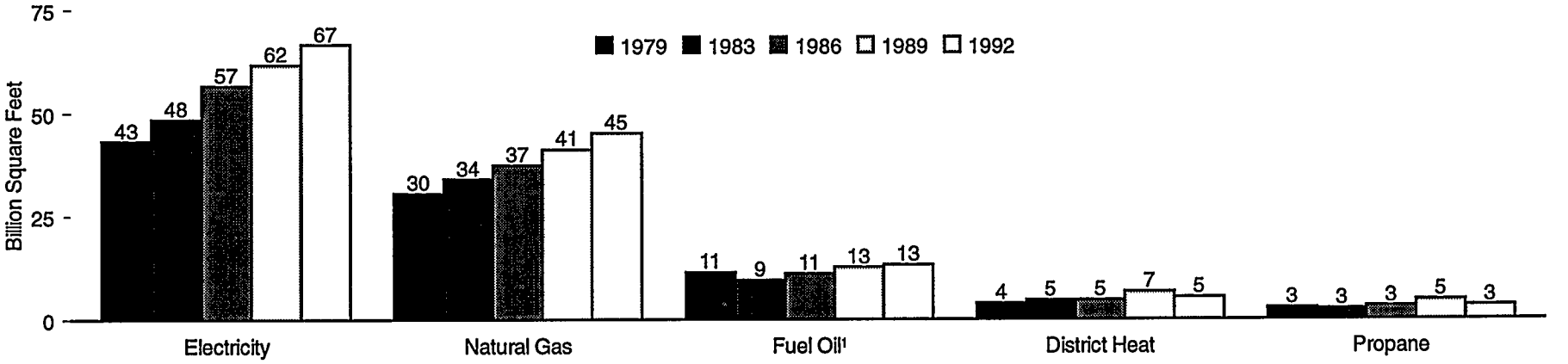
Sources: • 1960-1975—Federal Highway Administration, *Highway Statistics Summary to 1975,* Tables MV-201 and MF-221. • 1976-1986—Federal Highway Administration, *Highway Statistics Annual,* Tables MV-1, MF-21, and MF-25. • 1987 forward—Federal Highway Administration, *Selected Highway Statistics and Charts 1994.*

## Figure 2.17 Commercial Buildings Characteristics by Energy Source

### By Census Region, 1992




### By Survey Year




¹ Distillate fuel oil, residual fuel oil, and kerosene.

Source: Table 2.17. See Appendix F for Census regions.

# Table 2.17 Commercial Buildings Characteristics by Energy Source, Selected Years, 1979-1992

(Billion Square Feet)

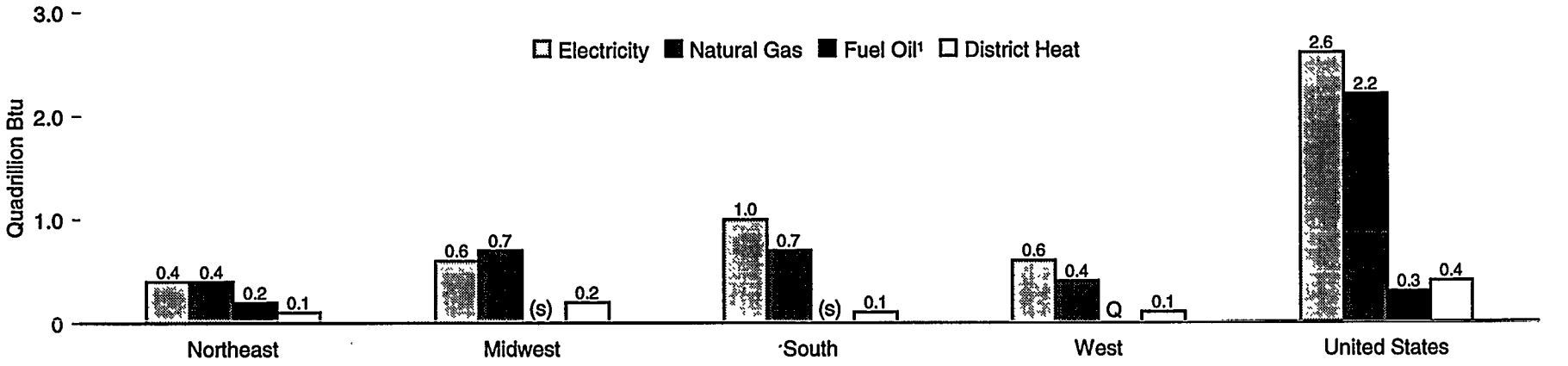
| Energy Source and Year | Square Footage Category | | | Principal Building Activity | | | | Census Region [1] | | | | All Buildings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,001 to 10,000 | 10,001 to 100,000 | Over 100,000 | Mercantile and Service | Office | Education | All Other | Northeast | Midwest | South | West | |
| **All Buildings** | | | | | | | | | | | | |
| 1979 | 9.21 | 20.89 | 13.44 | 9.96 | 6.99 | 5.97 | 20.63 | 9.53 | 14.20 | 13.66 | 6.16 | 43.55 |
| 1983 | 9.26 | 22.35 | 17.86 | 10.32 | 8.31 | 6.04 | 24.80 | 10.25 | 15.25 | 16.61 | 7.36 | 49.47 |
| 1986 | 13.07 | 26.34 | 18.79 | 12.81 | 9.55 | 7.29 | 28.56 | 11.83 | 16.03 | 19.40 | 10.94 | 58.20 |
| 1989 | 13.32 | 28.32 | 21.54 | 12.37 | 11.80 | 8.08 | 30.94 | 13.57 | 15.96 | 22.04 | 11.62 | 63.18 |
| 1992 | 14.53 | 28.51 | 24.84 | 12.40 | 12.32 | 8.47 | 34.69 | 13.40 | 17.28 | 24.58 | 12.62 | 67.88 |
| **Electricity** | | | | | | | | | | | | |
| 1979 | 8.99 | 20.76 | 13.41 | 9.92 | 6.98 | 5.97 | 20.29 | 9.46 | 14.16 | 13.42 | 6.11 | 43.15 |
| 1983 | 8.86 | 21.79 | 17.68 | 10.24 | 8.27 | 6.03 | 23.78 | 9.98 | 14.88 | 16.22 | 7.24 | 48.33 |
| 1986 | 12.49 | 25.52 | 18.50 | 12.71 | 9.50 | 7.20 | 27.10 | 11.43 | 15.68 | 18.75 | 10.65 | 56.51 |
| 1989 | 12.71 | 27.58 | 21.28 | 12.36 | 11.80 | 8.07 | 29.34 | 13.33 | 15.70 | 21.22 | 11.32 | 61.56 |
| 1992 | 14.05 | 27.89 | 24.61 | 12.39 | 12.32 | 8.47 | 33.37 | 13.24 | 16.91 | 23.99 | 12.42 | 66.55 |
| **Natural Gas** | | | | | | | | | | | | |
| 1979 | 5.58 | 14.41 | 10.50 | 7.56 | 4.61 | 4.17 | 14.13 | 6.75 | 11.81 | 7.77 | 4.15 | 30.48 |
| 1983 | 5.53 | 14.82 | 13.58 | 7.90 | 5.50 | 4.45 | 16.09 | 6.95 | 12.79 | 9.17 | 5.02 | 33.94 |
| 1986 | 7.03 | 16.15 | 14.09 | 8.74 | 5.73 | 5.52 | 17.28 | 6.89 | 12.42 | 10.43 | 7.53 | 37.26 |
| 1989 | 7.38 | 17.41 | 16.36 | 8.79 | 7.22 | 6.64 | 18.49 | 8.52 | 12.81 | 11.66 | 8.15 | 41.14 |
| 1992 | 8.03 | 19.11 | 17.96 | 9.38 | 7.86 | 6.85 | 21.01 | 8.56 | 13.84 | 13.41 | 9.29 | 45.10 |
| **Fuel Oil [2]** | | | | | | | | | | | | |
| 1979 | 1.92 | 4.73 | 4.75 | 2.09 | 1.75 | 2.28 | 5.28 | 4.41 | 2.97 | 2.97 | 1.04 | 11.40 |
| 1983 | 1.21 | 3.36 | 4.83 | 1.50 | 1.59 | 1.43 | 4.89 | 4.21 | 1.77 | 2.84 | 0.60 | 9.41 |
| 1986 | 1.71 | 3.97 | 5.33 | 2.42 | 1.76 | 1.68 | 5.14 | 5.09 | 2.04 | 2.52 | 1.36 | 11.01 |
| 1989 | 1.52 | 4.49 | 6.59 | 1.62 | 2.91 | 2.21 | 5.87 | 5.13 | 3.20 | 2.84 | 1.43 | 12.60 |
| 1992 | 1.75 | 3.89 | 7.57 | 2.11 | 3.60 | 1.84 | 5.67 | 5.53 | 2.54 | 3.58 | 1.56 | 13.22 |
| **District Heat [3]** | | | | | | | | | | | | |
| 1979 | Q | 1.17 | 2.64 | Q | 1.19 | 0.40 | 1.98 | 1.26 | 1.58 | 0.65 | 0.39 | 3.88 |
| 1983 | Q | 1.39 | 3.16 | Q | 1.25 | 0.45 | 2.46 | 1.37 | 1.93 | 0.80 | 0.53 | 4.64 |
| 1986 | 0.10 | 1.49 | 3.04 | 0.16 | 1.45 | 0.83 | 2.18 | 1.38 | 1.80 | 0.71 | 0.74 | 4.63 |
| 1989 | 0.15 | 1.88 | 4.55 | Q | 2.32 | 1.13 | 3.02 | 2.24 | 1.51 | 1.58 | 1.25 | 6.58 |
| 1992 | 0.13 | 1.65 | 3.56 | 0.15 | 1.71 | 0.69 | 2.79 | 1.56 | 1.88 | 0.98 | 0.91 | 5.34 |
| **Propane** | | | | | | | | | | | | |
| 1979 | 0.66 | 1.21 | 0.93 | 0.63 | 0.14 | 0.47 | 1.56 | 0.44 | 0.73 | 1.40 | 0.23 | 2.80 |
| 1983 | 0.59 | 0.89 | 1.07 | Q | Q | 0.35 | 1.54 | 0.47 | 0.44 | 1.59 | Q | 2.56 |
| 1986 | 1.08 | 1.61 | 0.52 | 0.64 | Q | 0.37 | 2.10 | 0.78 | 0.66 | 1.35 | 0.42 | 3.21 |
| 1989 | 1.04 | 1.95 | 1.71 | 0.91 | Q | 1.14 | 2.52 | 1.07 | 1.06 | 1.74 | Q | 4.69 |
| 1992 | 1.04 | 1.37 | 0.99 | 0.74 | 0.21 | 0.47 | 1.97 | 1.04 | 0.58 | 1.51 | 0.26 | 3.39 |

[1] See Appendix F for Census regions.
[2] Distillate fuel oil, residual fuel oil, and kerosene.
[3] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

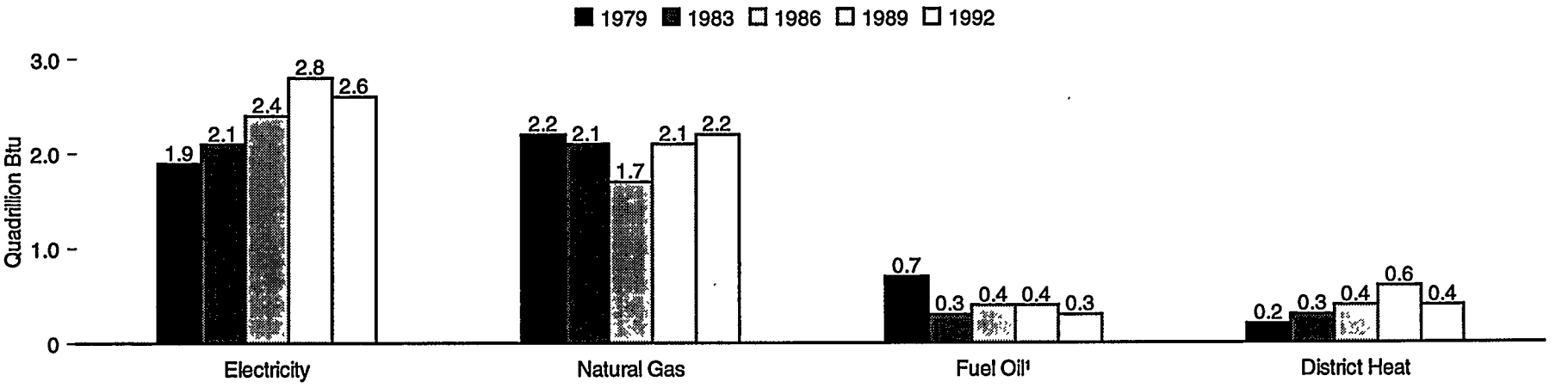
Sources: • 1979—Energy Information Administration (EIA), Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871A, "Commercial Buildings Energy Consumption Survey."

## Figure 2.18 Commercial Buildings Consumption by Energy Source

**By Census Region, 1992**




**By Survey Year**




¹ Distillate fuel oil, residual fuel oil, and kerosene.
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled. (s)=Less than 50 trillion Btu.
Source: Table 2.18. See Appendix F for Census regions.

# Table 2.18 Commercial Buildings Consumption by Energy Source, Selected Years, 1979-1992

(Trillion Btu)

| Energy Source and Year | Square Footage Category | | | Principal Building Activity | | | | Census Region [1] | | | | All Buildings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,001 to 10,000 | 10,001 to 100,000 | Over 100,000 | Mercantile and Service | Office | Education | All Other | Northeast | Midwest | South | West | |
| **Major Sources [2]** | | | | | | | | | | | | |
| 1979 | 1,255 | 2,202 | 1,508 | 894 | 861 | 511 | 2,699 | 1,217 | 1,826 | 1,395 | 526 | 4,965 |
| 1983 | 1,242 | 1,935 | 1,646 | 812 | 1,018 | 480 | 2,513 | 858 | 1,821 | 1,462 | 682 | 4,823 |
| 1986 | 1,273 | 2,008 | 1,696 | 985 | 1,008 | 633 | 2,351 | 1,037 | 1,585 | 1,459 | 896 | 4,977 |
| 1989 | 1,259 | 2,402 | 2,127 | 1,048 | 1,230 | 704 | 2,806 | 1,354 | 1,659 | 1,648 | 1,126 | 5,788 |
| 1992 | 1,258 | 2,301 | 1,932 | 892 | 1,247 | 637 | 2,714 | 1,090 | 1,578 | 1,825 | 998 | 5,490 |
| **Electricity** | | | | | | | | | | | | |
| 1979 | 429 | 872 | 608 | 361 | 424 | 163 | 961 | 425 | 593 | 662 | 227 | 1,908 |
| 1983 | 469 | 903 | 758 | 426 | 509 | 152 | 1,041 | 324 | 673 | 801 | 331 | 2,129 |
| 1986 | 654 | 927 | 809 | 536 | 641 | 179 | 1,035 | 430 | 584 | 867 | 510 | 2,390 |
| 1989 | 572 | 1,145 | 1,056 | 550 | 781 | 217 | 1,225 | 586 | 609 | 975 | 604 | 2,773 |
| 1992 | 586 | 991 | 1,033 | 444 | 704 | 235 | 1,226 | 419 | 622 | 1,002 | 566 | 2,609 |
| **Natural Gas** | | | | | | | | | | | | |
| 1979 | 646 | 996 | 532 | 422 | 272 | 214 | 1,266 | 443 | 1,007 | 470 | 255 | 2,174 |
| 1983 | 684 | 809 | 597 | 327 | 365 | 246 | 1,152 | 278 | 978 | 523 | 311 | 2,091 |
| 1986 | 485 | 715 | 523 | 332 | 258 | 254 | 879 | 244 | 742 | 426 | 311 | 1,723 |
| 1989 | 568 | 836 | 670 | 417 | 238 | 323 | 1,095 | 353 | 831 | 498 | 391 | 2,073 |
| 1992 | 572 | 1,017 | 586 | 381 | 388 | 291 | 1,115 | 354 | 747 | 697 | 376 | 2,174 |
| **Fuel Oil [3]** | | | | | | | | | | | | |
| 1979 | 177 | 272 | 231 | 103 | 107 | 107 | 364 | 285 | 133 | 237 | 26 | 681 |
| 1983 | 85 | 140 | 90 | 43 | 75 | 61 | 135 | 172 | 28 | 104 | Q | 314 |
| 1986 | 114 | 206 | 121 | 105 | 39 | 103 | 194 | 270 | 63 | 86 | 23 | 442 |
| 1989 | 101 | 170 | 86 | 76 | 43 | 71 | 167 | 237 | 61 | 50 | Q | 357 |
| 1992 | 86 | 111 | 75 | 55 | 47 | 62 | 109 | 194 | 26 | 48 | Q | 272 |
| **District Heat [4]** | | | | | | | | | | | | |
| 1979 | Q | 61 | 136 | Q | 58 | 27 | 108 | 64 | 93 | Q | Q | 201 |
| 1983 | Q | 83 | 202 | Q | 68 | 21 | 184 | 84 | 141 | 34 | 30 | 289 |
| 1986 | Q | 159 | 243 | 12 | 71 | 97 | 243 | 94 | 196 | 81 | 51 | 422 |
| 1989 | 19 | 252 | 315 | Q | 167 | Q | 319 | 179 | 159 | 126 | 121 | 585 |
| 1992 | Q | 182 | 238 | Q | 109 | 49 | 264 | 123 | 183 | 78 | 51 | 435 |
| **Propane [5]** | | | | | | | | | | | | |
| 1979 | 23 | 15 | 5 | 10 | Q | 2 | 29 | Q | 16 | 15 | 10 | 43 |
| 1983 | 20 | 12 | 2 | 6 | Q | 2 | 24 | Q | 7 | 21 | Q | 34 |
| 1986 | 44 | 18 | 1 | 17 | Q | 3 | 42 | 9 | 19 | 26 | Q | 63 |

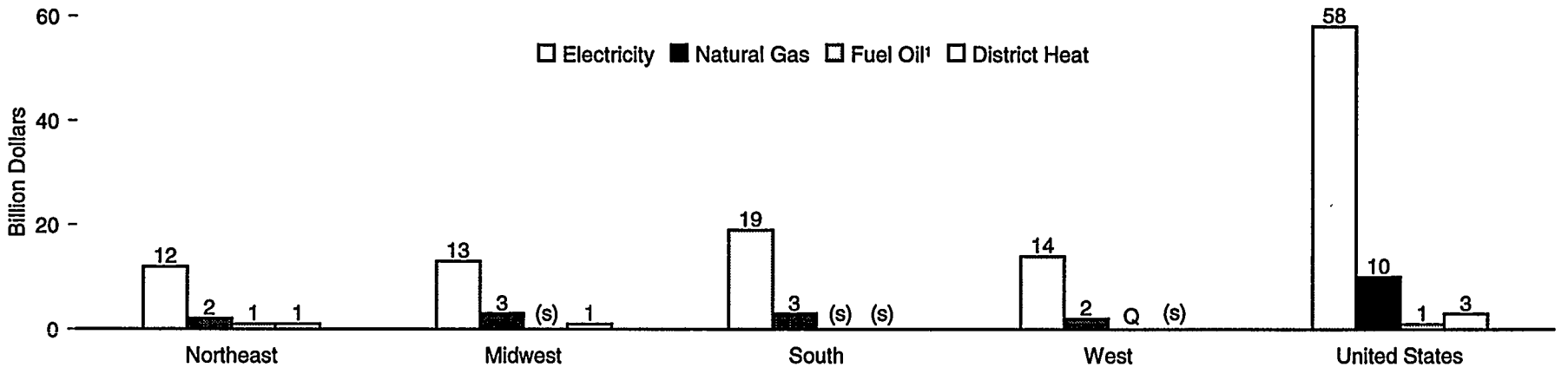
[1] See Appendix F for Census regions.
[2] Includes electricity, natural gas, fuel oil, and district heat.
[3] Distillate fuel oil, residual fuel oil, and kerosene.
[4] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.
[5] After 1986, propane data were no longer collected.
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

Note: Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for the sum of electricity, natural gas, fuel oil, and district heat, across all buildings using any of those fuels.

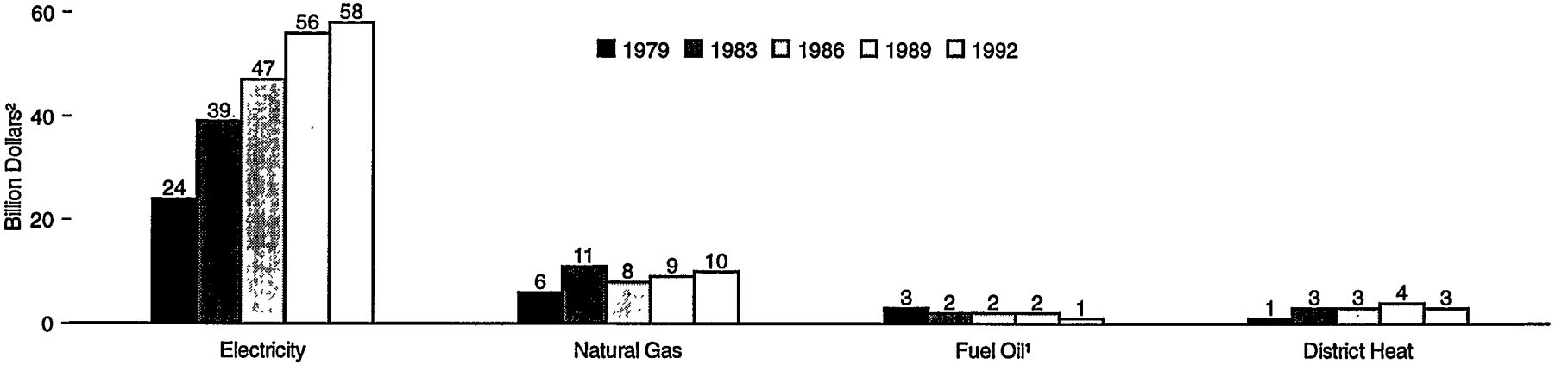
Sources: • 1979—EIA, Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

# Figure 2.19 Commercial Buildings Expenditures by Energy Source

**By Census Region, 1992**




**By Survey Year**




¹ Distillate fuel oil, residual fuel oil, and kerosene.
² Nominal dollars.
(s)=Less than 500 million dollars. Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.
Note: See Appendix F for Census regions.
Source: Table 2.19.

# Table 2.19 Commercial Buildings Expenditures by Energy Source, Selected Years, 1979-1992

(Million Dollars[1])

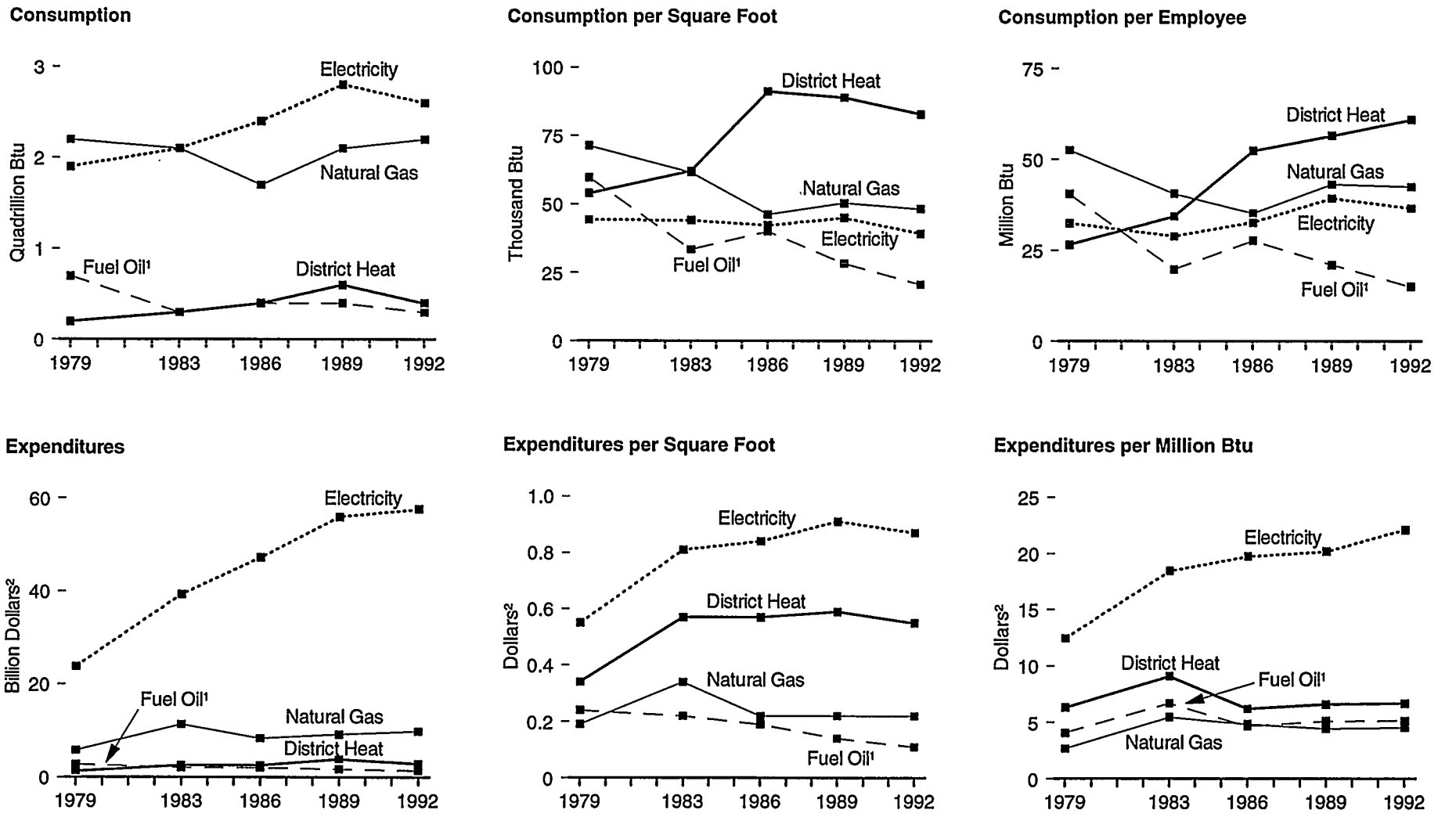
| Energy Source and Year | Square Footage Category | | | Principal Building Activity | | | | Census Region[2] | | | | All Buildings |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1,001 to 10,000 | 10,001 to 100,000 | Over 100,000 | Mercantile and Service | Office | Education | All Other | Northeast | Midwest | South | West | |
| **Major Sources[3]** | | | | | | | | | | | | |
| 1979 | 8,587 | 15,120 | 9,889 | 6,384 | 7,438 | 3,051 | 16,723 | 9,405 | 10,661 | 10,106 | 3,424 | 33,596 |
| 1983 | 13,891 | 22,978 | 18,582 | 9,958 | 12,814 | 4,786 | 27,892 | 12,399 | 18,009 | 17,868 | 7,174 | 55,451 |
| 1986 | 17,411 | 23,512 | 19,296 | 13,091 | 14,763 | 5,762 | 26,604 | 14,269 | 15,718 | 17,725 | 12,508 | 60,219 |
| 1989 | 17,472 | 28,943 | 24,411 | 13,527 | 18,323 | 6,589 | 32,386 | 17,505 | 16,468 | 21,759 | 15,093 | 70,826 |
| 1992 | 18,554 | 28,473 | 24,794 | 12,907 | 18,102 | 7,389 | 33,423 | 16,226 | 16,957 | 22,843 | 15,795 | 71,821 |
| **Electricity** | | | | | | | | | | | | |
| 1979 | 5,958 | 10,994 | 6,799 | 4,655 | 5,862 | 1,936 | 11,298 | 6,493 | 7,009 | 7,756 | 2,493 | 23,751 |
| 1983 | 9,338 | 16,779 | 13,162 | 7,602 | 9,651 | 2,925 | 19,101 | 8,406 | 11,594 | 14,176 | 5,103 | 39,279 |
| 1986 | 14,137 | 18,046 | 15,003 | 10,781 | 12,884 | 3,606 | 19,915 | 10,886 | 10,869 | 14,856 | 10,575 | 47,186 |
| 1989 | 13,824 | 22,770 | 19,349 | 11,116 | 15,757 | 4,391 | 24,679 | 13,188 | 11,697 | 18,409 | 12,649 | 55,943 |
| 1992 | 14,872 | 22,183 | 20,565 | 10,583 | 15,511 | 5,526 | 25,999 | 12,250 | 12,745 | 19,097 | 13,527 | 57,619 |
| **Natural Gas** | | | | | | | | | | | | |
| 1979 | 1,804 | 2,654 | 1,356 | 1,231 | 728 | 551 | 3,304 | 1,320 | 2,547 | 1,255 | 692 | 5,814 |
| 1983 | 3,886 | 4,485 | 3,071 | 1,904 | 1,999 | 1,317 | 6,223 | 1,874 | 5,172 | 2,675 | 1,721 | 11,443 |
| 1986 | 2,522 | 3,543 | 2,289 | 1,706 | 1,178 | 1,189 | 4,282 | 1,472 | 3,400 | 1,958 | 1,524 | 8,355 |
| 1989 | 2,924 | 3,760 | 2,520 | 1,931 | 1,128 | 1,309 | 4,836 | 1,807 | 3,381 | 2,293 | 1,724 | 9,204 |
| 1992 | 3,058 | 4,625 | 2,218 | 1,899 | 1,618 | 1,271 | 5,114 | 2,014 | 3,011 | 2,998 | 1,878 | 9,901 |
| **Fuel Oil[4]** | | | | | | | | | | | | |
| 1979 | 798 | 1,117 | 850 | 457 | 443 | 396 | 1,469 | 1,149 | 569 | 932 | 116 | 2,765 |
| 1983 | 630 | 947 | 525 | 319 | 501 | 387 | 896 | 1,141 | 198 | 688 | 75 | 2,102 |
| 1986 | 616 | 970 | 473 | 516 | 194 | 448 | 901 | 1,272 | 278 | 394 | 115 | 2,059 |
| 1989 | 582 | 862 | 378 | 430 | 232 | 331 | 829 | 1,225 | 310 | 241 | Q | 1,822 |
| 1992 | 516 | 561 | 323 | 318 | 245 | 277 | 560 | 989 | 132 | 257 | Q | 1,400 |
| **District Heat[5]** | | | | | | | | | | | | |
| 1979 | Q | 355 | 885 | Q | 405 | 169 | 652 | 444 | 535 | 163 | 124 | 1,267 |
| 1983 | Q | 767 | 1,823 | Q | 664 | 157 | 1,673 | 977 | 1,045 | 329 | 275 | 2,627 |
| 1986 | Q | 953 | 1,530 | 88 | 507 | 519 | 1,506 | 639 | 1,170 | 516 | 294 | 2,620 |
| 1989 | 141 | 1,551 | 2,165 | Q | 1,207 | Q | 2,042 | 1,286 | 1,081 | 816 | Q | 3,857 |
| 1992 | Q | 1,688 | 1,689 | Q | 728 | 315 | 1,751 | 973 | 1,069 | 492 | 368 | 2,901 |
| **Propane[6]** | | | | | | | | | | | | |
| 1979 | 123 | 80 | 22 | 52 | Q | 10 | 153 | Q | 76 | 81 | 47 | 225 |
| 1983 | 190 | 109 | 14 | 56 | Q | 12 | 222 | Q | 62 | 201 | Q | 313 |
| 1986 | 370 | 163 | 10 | 140 | Q | 20 | 368 | 93 | 131 | 221 | Q | 543 |

[1] Nominal dollars.
[2] See Appendix F for Census regions.
[3] Includes electricity, natural gas, fuel oil, and district heat.
[4] Distillate fuel oil, residual fuel oil, and kerosene.
[5] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.
[6] After 1986, propane data were no longer collect.
Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

Note: Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for the sum of electricity, natural gas, fuel oil, and district heat across all buildings using any of those fuels.

Sources: • 1979—EIA, Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

# Figure 2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992




¹ Distillate fuel oil, residual fuel oil, and kerosene.
² Nominal dollars.
Notes: • No data are available for 1980-1982, 1984-1985, 1987-1988, and 1990-1991.
• Because vertical scales differ, graphs should not be compared.
Source: Table 2.20.

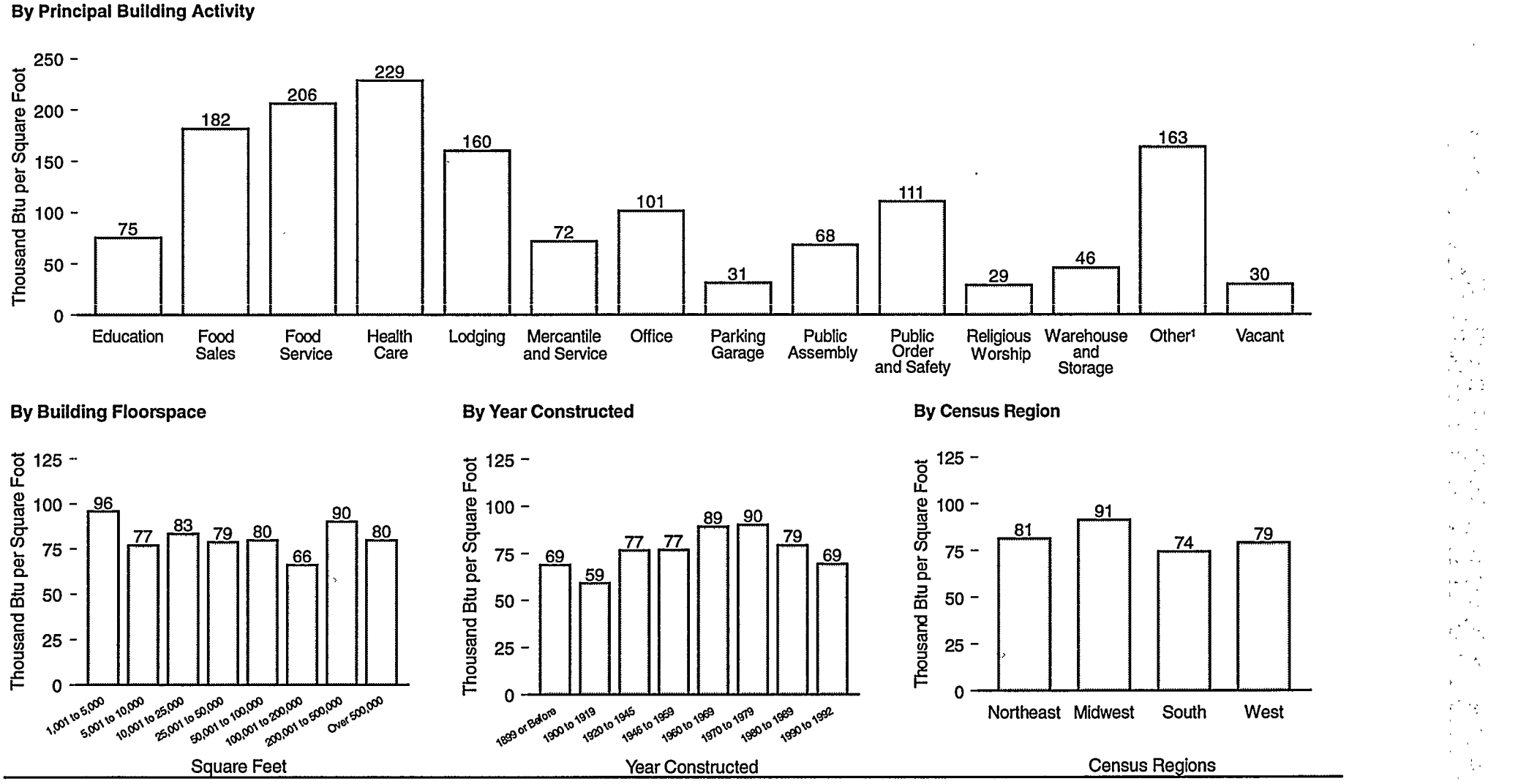
# Table 2.20 Commercial Buildings Energy Consumption and Expenditure Indicators, Selected Years, 1979-1992

| Energy Source and Year | Building Characteristics | | | Energy Consumption | | | | Energy Expenditures | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Buildings (thousand) | Total Square Feet (million) | Square Feet per Building (thousand) | Total (trillion Btu) | Per Building (million Btu) | Per Square Foot (thousand Btu) | Per Employee (million Btu) | Total (million dollars[1]) | Per Building (thousand dollars[1]) | Per Square Foot (dollars[1]) | Per Million Btu (dollars[1]) |
| **Major Sources [2]** | | | | | | | | | | | |
| 1979 | 3,073 | 43,546 | 14.2 | 5,008 | 1,630 | 115.0 | 85.0 | 33,821 | 11.0 | 0.78 | 6.75 |
| 1983 | 3,185 | 49,471 | 15.5 | 4,856 | 1,525 | 98.2 | 65.7 | 55,764 | 17.5 | 1.13 | 11.48 |
| 1986 | 4,154 | 58,199 | 14.0 | 5,040 | 1,213 | 86.6 | 68.6 | 60,762 | 14.6 | 1.04 | 12.06 |
| 1989 | 4,528 | 63,184 | 14.0 | 5,788 | 1,278 | 91.6 | 81.9 | 70,826 | 15.6 | 1.12 | 12.24 |
| 1992 | 4,806 | 67,876 | 14.1 | 5,490 | 1,142 | 80.9 | 77.1 | 71,821 | 14.9 | 1.06 | 13.08 |
| **Electricity** | | | | | | | | | | | |
| 1979 | 3,001 | 43,153 | 14.4 | 1,908 | 636 | 44.2 | 32.4 | 23,751 | 7.9 | 0.55 | 12.45 |
| 1983 | 3,052 | 48,327 | 15.8 | 2,129 | 697 | 44.1 | 28.9 | 39,279 | 12.9 | 0.81 | 18.45 |
| 1986 | 3,965 | 56,508 | 14.3 | 2,390 | 603 | 42.3 | 32.7 | 47,186 | 11.9 | 0.84 | 19.74 |
| 1989 | 4,294 | 61,563 | 14.3 | 2,773 | 646 | 45.0 | 39.3 | 55,943 | 13.0 | 0.91 | 20.17 |
| 1992 | 4,611 | 66,525 | 14.4 | 2,609 | 566 | 39.2 | 36.6 | 57,619 | 12.5 | 0.87 | 22.09 |
| **Natural Gas** | | | | | | | | | | | |
| 1979 | 1,864 | 30,477 | 16.4 | 2,174 | 1,167 | 71.3 | 52.5 | 5,814 | 3.1 | 0.19 | 2.67 |
| 1983 | 1,904 | 33,935 | 17.8 | 2,091 | 1,098 | 61.6 | 40.6 | 11,443 | 6.0 | 0.34 | 5.47 |
| 1986 | 2,214 | 37,263 | 16.8 | 1,723 | 778 | 46.2 | 35.2 | 8,355 | 3.8 | 0.22 | 4.85 |
| 1989 | 2,420 | 41,143 | 17.0 | 2,073 | 857 | 50.4 | 43.2 | 9,204 | 3.8 | 0.22 | 4.44 |
| 1992 | 2,657 | 44,994 | 16.9 | 2,174 | 818 | 48.3 | 42.5 | 9,901 | 3.7 | 0.22 | 4.55 |
| **Fuel Oil [3]** | | | | | | | | | | | |
| 1979 | 641 | 11,397 | 17.8 | 681 | 1,063 | 59.7 | 40.5 | 2,765 | 4.3 | 0.24 | 4.06 |
| 1983 | 441 | 9,409 | 21.3 | 314 | 714 | 33.4 | 19.8 | 2,102 | 4.8 | 0.22 | 6.68 |
| 1986 | 534 | 11,005 | 20.6 | 442 | 827 | 40.1 | 27.7 | 2,059 | 3.9 | 0.19 | 4.66 |
| 1989 | 581 | 12,600 | 21.7 | 357 | 614 | 28.3 | 21.0 | 1,822 | 3.1 | 0.14 | 5.11 |
| 1992 | 560 | 13,215 | 23.6 | 272 | 487 | 20.6 | 15.1 | 1,400 | 2.5 | 0.11 | 5.14 |
| **District Heat [4]** | | | | | | | | | | | |
| 1979 | 47 | 3,722 | 79.0 | 201 | 4,267 | 54.0 | 26.5 | 1,267 | 26.9 | 0.34 | 6.30 |
| 1983 | 64 | 4,643 | 72.9 | 289 | 4,530 | 62.1 | 34.4 | 2,627 | 41.2 | 0.57 | 9.10 |
| 1986 | 77 | 4,625 | 59.7 | 422 | 5,446 | 91.2 | 52.4 | 2,620 | 33.8 | 0.57 | 6.21 |
| 1989 | 98 | 6,578 | 67.0 | 585 | 5,964 | 89.0 | 56.5 | 3,857 | 39.3 | 0.59 | 6.59 |
| 1992 | 95 | 5,245 | 55.4 | 435 | 4,596 | 82.9 | 60.9 | 2,901 | 30.7 | 0.55 | 6.67 |
| **Propane** | | | | | | | | | | | |
| 1979 | 214 | 2,797 | 13.1 | 43 | 202 | 15.5 | 12.9 | 225 | 1.1 | 0.08 | 5.19 |
| 1983 | 191 | 2,562 | 13.4 | 34 | 176 | 13.1 | 8.5 | 313 | 1.6 | 0.12 | 9.29 |
| 1986 | 344 | 3,213 | 9.3 | 63 | 184 | 19.7 | 17.6 | 543 | 1.6 | 0.17 | 8.59 |
| 1989 | 348 | 4,695 | 13.5 | NA | NA | NA | NA | NA | NA | NA | NA |
| 1992 | 337 | 3,393 | 10.1 | NA | NA | NA | NA | NA | NA | NA | NA |

[1] Nominal dollars.
[2] For 1979, 1983 and 1986, includes electricity, natural gas, fuel oil, district heat, and propane. For 1989 and 1992, includes electricity, natural gas, fuel oil, and district heat. Propane consumption statistics were not collected in 1989 or 1992.
[3] Distillate fuel oil, residual fuel oil, and kerosene.
[4] For 1979 and 1983, includes only purchased steam. For 1986, 1989, and 1992, includes purchased and nonpurchased steam and purchased and nonpurchased hot water.
NA=Not available.

Note: Statistics for individual fuels are for all buildings using each fuel. Statistics for major sources are for all buildings, even buildings using no major fuel.
Sources: • 1979—EIA, Form EIA-143, "Nonresidential Buildings Energy Consumption Survey." • 1983—EIA, Form EIA-788, "Nonresidential Buildings Energy Consumption Survey." • 1986—EIA, Form EIA-871, "Nonresidential Buildings Energy Consumption Survey." • 1989 and 1992—EIA, Form EIA-871A-F, "Commercial Buildings Energy Consumption Survey."

# Figure 2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1992




[1] Includes buildings that do not fit into any of the other named categories.

Notes: • See Appendix F for Census regions. • Because vertical scales differ, graphs should not be compared.

Source: Table 2.21.

# Table 2.21 Commercial Buildings Energy Intensities by Building Characteristic, 1992

(Thousand Btu per Square Foot)

| Building Characteristic | Space Heating | Cooling | Ventilation | Water Heating | Lighting | Cooking | Refrigeration | Office Equipment | Other [1] | All End Uses |
|---|---|---|---|---|---|---|---|---|---|---|
| **All Buildings** | 28.2 | 6.8 | 2.5 | 12.6 | 17.1 | 3.3 | 2.0 | 3.0 | 5.3 | 80.9 |
| **Building Floorspace (square feet)** | | | | | | | | | | |
| 1,001 to 5,000 | 34.3 | 8.3 | 2.8 | 14.0 | 17.1 | 8.0 | 5.6 | 2.7 | 3.2 | 95.9 |
| 5,001 to 10,000 | 27.7 | 8.2 | 2.0 | 13.6 | 13.4 | 5.1 | 2.0 | 2.4 | 2.7 | 77.1 |
| 10,001 to 25,000 | 36.0 | 6.2 | 1.6 | 15.4 | 13.4 | 2.5 | 2.2 | 2.7 | 3.4 | 83.4 |
| 25,001 to 50,000 | 26.8 | 6.7 | 2.1 | 13.5 | 14.4 | 2.3 | 1.7 | 2.4 | 9.1 | 78.8 |
| 50,001 to 100,000 | 31.5 | 6.5 | 2.5 | 10.0 | 17.6 | 1.5 | 1.7 | 2.8 | 5.5 | 79.7 |
| 100,001 to 200,000 | 21.8 | 5.7 | 2.5 | 8.9 | 17.3 | 1.3 | 1.0 | 3.0 | 4.5 | 66.2 |
| 200,001 to 500,000 | 25.8 | 6.8 | 3.4 | 15.1 | 24.3 | 3.6 | 0.9 | 4.3 | 5.8 | 90.1 |
| Over 500,000 | 21.0 | 6.8 | 3.2 | 10.4 | 21.3 | 3.8 | 1.1 | 4.4 | 7.9 | 79.8 |
| **Principal Building Activity** | | | | | | | | | | |
| Education | 40.2 | 6.2 | 1.3 | 7.2 | 15.5 | 0.9 | 0.8 | 0.5 | 2.7 | 75.2 |
| Food Sales | 21.3 | 12.8 | 4.5 | 11.9 | 27.9 | 6.6 | 84.1 | 0.9 | 11.5 | 181.5 |
| Food Service | 28.7 | 35.3 | 6.2 | 24.8 | 18.5 | 77.8 | 11.3 | 0.3 | 3.1 | 206.1 |
| Health Care | 50.1 | 18.3 | 6.5 | 72.4 | 29.7 | 16.8 | 3.3 | 8.5 | 23.0 | 228.5 |
| Lodging | 51.2 | 20.8 | 3.4 | 41.6 | 22.0 | 4.4 | 1.6 | 1.0 | 14.1 | 160.1 |
| Mercantile and Service | 24.6 | 3.4 | 2.1 | 14.8 | 18.7 | 1.5 | 1.2 | 2.2 | 3.5 | 71.9 |
| Office | 33.2 | 11.4 | 6.1 | 11.0 | 18.9 | 1.4 | 0.3 | 11.1 | 7.8 | 101.2 |
| Parking Garage | 7.1 | Q | 0.5 | 3.1 | 18.0 | Q | 0.0 | 0.0 | 0.4 | 31.3 |
| Public Assembly | 21.9 | 4.5 | 1.4 | 8.8 | 25.3 | 2.2 | 0.7 | 0.4 | 2.7 | 68.0 |
| Public Order and Safety | 44.3 | 4.6 | 1.0 | 31.2 | 24.3 | 2.1 | 0.0 | 0.3 | 2.8 | 110.6 |
| Religious Worship | 17.4 | 1.9 | 0.8 | 3.2 | 3.8 | 0.7 | 0.3 | 0.1 | 0.9 | 29.0 |
| Warehouse and Storage | 18.2 | 1.9 | 0.2 | 5.6 | 13.9 | Q | 1.1 | 1.1 | 3.7 | 45.9 |
| Other [2] | 71.2 | 8.1 | 5.9 | 23.0 | 32.3 | 0.5 | 0.1 | 2.4 | 19.7 | 163.2 |
| Vacant | 14.4 | 1.4 | 0.3 | 2.7 | 5.7 | Q | 0.1 | 0.1 | Q | 29.9 |
| **Year Constructed** | | | | | | | | | | |
| 1899 or Before | 33.9 | 6.0 | 0.9 | 11.6 | 7.1 | 4.2 | 1.1 | 2.1 | 1.6 | 68.6 |
| 1900 to 1919 | 30.7 | 3.7 | 0.9 | 9.0 | 8.3 | 2.5 | 0.6 | 1.4 | 2.0 | 59.1 |
| 1920 to 1945 | 37.2 | 6.9 | 1.5 | 11.9 | 9.5 | 3.2 | 1.4 | 1.6 | 3.3 | 76.5 |
| 1946 to 1959 | 28.5 | 5.3 | 2.0 | 12.0 | 15.4 | 2.8 | 1.5 | 2.3 | 7.1 | 76.8 |
| 1960 to 1969 | 29.5 | 6.1 | 2.8 | 16.1 | 21.6 | 3.2 | 2.0 | 3.2 | 4.7 | 89.2 |
| 1970 to 1979 | 29.2 | 8.2 | 2.8 | 12.5 | 20.7 | 4.2 | 2.3 | 3.1 | 7.1 | 90.0 |
| 1980 to 1989 | 20.5 | 8.1 | 3.2 | 12.6 | 18.8 | 3.3 | 3.0 | 4.4 | 5.5 | 79.3 |
| 1990 to 1992 | 20.3 | 6.8 | 3.6 | 7.9 | 17.9 | 2.1 | 1.1 | 4.9 | 4.7 | 69.3 |
| **Census Region [3]** | | | | | | | | | | |
| Northeast | 34.7 | 4.5 | 1.3 | 13.6 | 14.7 | 3.8 | 1.7 | 2.7 | 4.3 | 81.3 |
| Midwest | 38.3 | 5.3 | 2.2 | 14.3 | 17.4 | 4.0 | 2.0 | 2.9 | 5.0 | 91.3 |
| South | 21.3 | 8.4 | 2.7 | 11.2 | 17.1 | 2.5 | 1.7 | 3.0 | 6.2 | 74.3 |
| West | 20.9 | 8.2 | 3.5 | 12.2 | 19.5 | 3.4 | 2.7 | 3.6 | 5.1 | 79.1 |

[1] Examples of "other" include medical, electronic, and testing equipment; conveyors, wrappers, hoists, and compactors; washers, disposals, dryers, and cleaning equipment; escalators, elevators, dumb waiters, and window washers; shop tools and electronic testing equipment; sign motors, time clocks, vending machines, phone equipment, and sprinkler controls; scoreboards, fire alarms, intercoms, television sets, radios, projectors, and door operators.

[2] Includes buildings that do not fit into any of the other named categories.

[3] See Appendix F for Census regions.

Q=Data withheld because either the relative standard error was greater than 50 percent or fewer than 20 buildings were sampled.

Source: Energy Information Administration, Form EIA-871A/F, "Commercial Buildings Consumption Survey."

# 3. Financial Indicators

## Fossil Fuel Prices Down From Record Levels

From the 1959 level of $1.25 per million Btu, real prices[1] of fossil fuels[2] trended downward to a low of $1.03 in 1968 (3.1).* Thereafter, prices began to escalate, sometimes abruptly. In 1974, the composite price of fossil fuels jumped from the 1973 level of $1.12 to $1.76, surpassing the 1959 level for the first time and registering the largest year-to-year increase (57 percent) of the 1959-to-1995 period. The peak of $4.17 was reached in 1981. Thereafter, the price declined each year through 1988, plunging 36 percent in 1986 alone. Although prices recovered somewhat in 1989 and 1990, they then declined to a 22-year low of $1.39 in 1995.

Crude oil was the most expensive of the fossil fuels over the entire period, with the exception of anthracite in 1975 through 1977. At its peak in 1981, the real price of crude oil reached $8.31 per million Btu, more than triple the price of natural gas and more than quadruple the price of nonanthracitic coal.

## Energy Expenditures Rose in 1993

The energy expenditure measure is the product of energy consumption and energy prices. In 1993, although energy prices declined, end-use energy consumption increased 2.1 percent (1.5). As a result, nominal expenditures rose 4.4 percent to $493 billion (3.6).

Nominal end-use expenditures of $226 billion for petroleum products accounted for 46 percent of total energy expenditures in 1993 (3.8). Expenditures for natural gas showed the largest year-to-year percentage increase. The 1993 total of $76 billion was $7.6 billion (11 percent) above the 1992 total. Expenditures for coal were $28 billion. Sales of electricity (net of expenditures by electric utilities for most fuels used to generate electricity) totaled $168 billion. Nuclear fuel and biomass fuels used at electric utilities accounted for $3.7 billion.

[1]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.
[2]Crude oil, natural gas, and coal.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Energy Industry Financial Performance

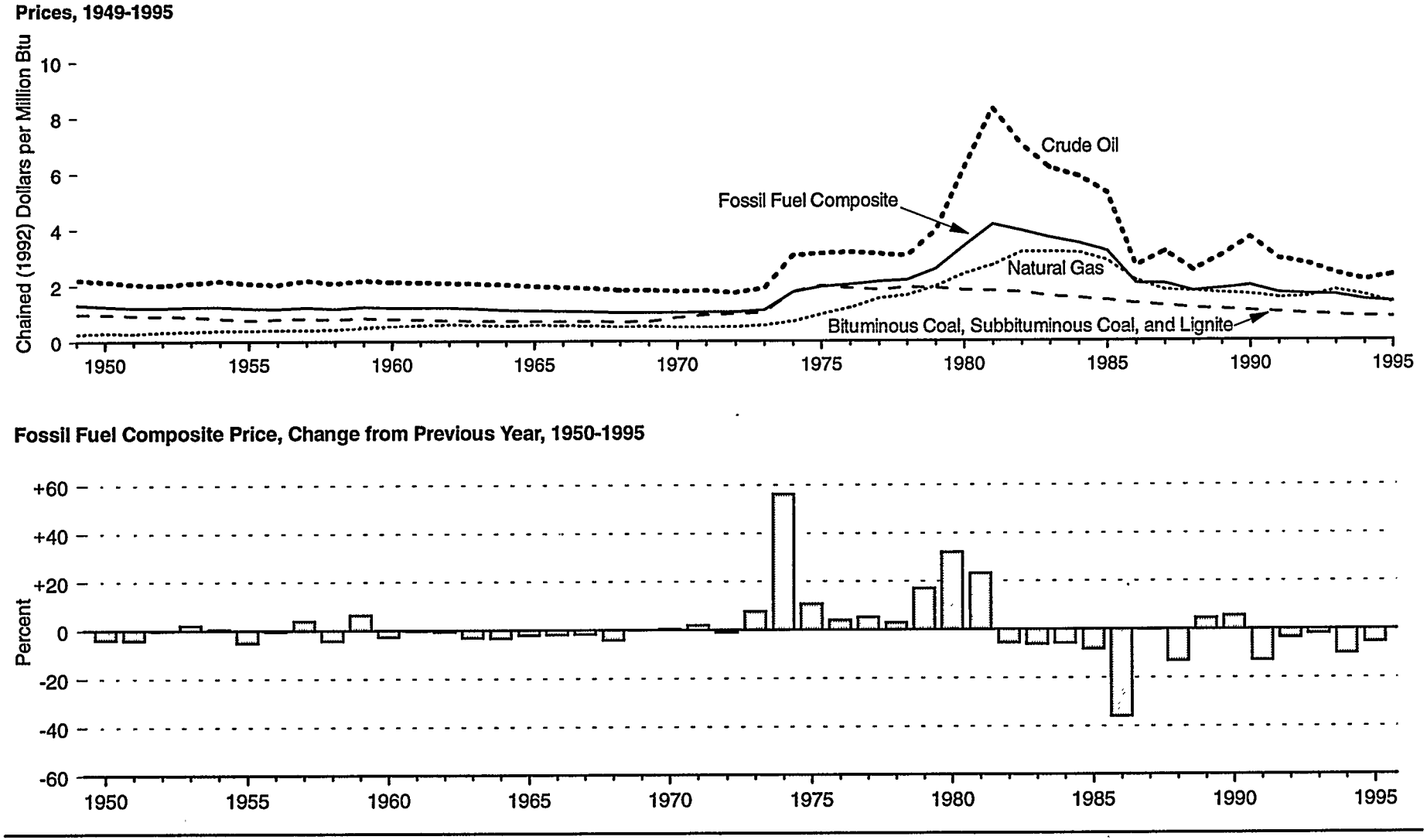
In 1994, the 24 major energy companies included in the Financial Reporting System (FRS)[3] accounted for 51 percent of U.S. crude oil and natural gas liquids production, 43 percent of dry natural gas production, and 17 percent of coal production (3.9). They also accounted for 66 percent of refinery capacity. The FRS companies continued to play a significant role in the U.S. economy. In 1994, their sales equaled 10 percent of the $4.3 trillion in sales of the *Fortune* 500 largest U.S. industrial corporations.[4]

Despite the decline in crude oil prices—the nominal composite refiner acquisition cost of crude oil of $15.59 per barrel in 1994 was the lowest since 1988 (5.19)—the FRS companies' net income rose to $17 billion (3.9). Low crude oil prices restrained net income from domestic petroleum and natural gas production, which totaled $4.8 billion in 1994 and contributed to a decline in net income from foreign petroleum and natural gas production, which declined $1.2 billion to $4.0 billion in 1994 (3.10). Net income from domestic refining and marketing rose from $1.7 billion to $1.8 billion in 1994, but net income from foreign refining and marketing decreased, from $3.2 billion in 1993 to $2.0 billion in 1994. Net income from the nonenergy line of business rose dramatically from $2.7 billion in 1993 to $6.2 billion in 1994 due to profits from chemical manufacturing, particularly petrochemical manufacturing.

FRS companies' additions to investment in place totaled $39 billion in 1994, down from $40 billion in 1993 (3.12). Petroleum and natural gas accounted for $31 billion of the 1994 total. Additions to investment in domestic petroleum and natural gas production exceeded additions to investment in foreign production.

[3]The FRS collects financial data from the major energy-producing companies. See Table 3.14 at end of section for a list of the U.S. energy companies reporting to the FRS.
[4]Energy Information Administration, *Performance Profiles of Major Energy Producers 1994*, DOE/EIA-0206(94) (Washington DC, January 1996), p. 3.

## Figure 3.1 Fossil Fuel Production Prices




Note: Prices are in chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Source: Table 3.1.

# Table 3.1 Fossil Fuel Production Prices, 1949-1995

(Dollars per Million Btu)

| Year | Crude Oil [1] | | Natural Gas [2] | | Bituminous Coal, Subbituminous Coal, and Lignite [3] | | Anthracite [4] | | Fossil Fuel Composite [5] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [6] | Nominal | Real [6] | Nominal | Real [6] | Nominal | Real [6] | Nominal | Real [6] | Percent Change |
| 1949 | 0.44 | ([7]) | 0.05 | ([7]) | 0.20 | ([7]) | 0.36 | ([7]) | 0.26 | ([7]) | — |
| 1950 | 0.43 | ([7]) | 0.06 | ([7]) | 0.19 | ([7]) | 0.38 | ([7]) | 0.26 | ([7]) | ([7]) |
| 1951 | 0.44 | ([7]) | 0.06 | ([7]) | 0.20 | ([7]) | 0.41 | ([7]) | 0.26 | ([7]) | ([7]) |
| 1952 | 0.44 | ([7]) | 0.07 | ([7]) | 0.20 | ([7]) | 0.39 | ([7]) | 0.26 | ([7]) | ([7]) |
| 1953 | 0.46 | ([7]) | 0.08 | ([7]) | 0.20 | ([7]) | 0.41 | ([7]) | 0.27 | ([7]) | ([7]) |
| 1954 | 0.48 | ([7]) | 0.09 | ([7]) | 0.18 | ([7]) | 0.36 | ([7]) | 0.28 | ([7]) | ([7]) |
| 1955 | 0.48 | ([7]) | 0.09 | ([7]) | 0.18 | ([7]) | 0.33 | ([7]) | 0.27 | ([7]) | ([7]) |
| 1956 | 0.48 | ([7]) | 0.10 | ([7]) | 0.19 | ([7]) | 0.35 | ([7]) | 0.28 | ([7]) | ([7]) |
| 1957 | 0.53 | ([7]) | 0.10 | ([7]) | 0.20 | ([7]) | 0.38 | ([7]) | 0.30 | ([7]) | ([7]) |
| 1958 | 0.52 | ([7]) | 0.11 | ([7]) | 0.19 | ([7]) | 0.38 | ([7]) | 0.29 | ([7]) | ([7]) |
| 1959 | 0.50 | R2.18 | 0.12 | R0.51 | 0.19 | R0.83 | 0.36 | R1.57 | 0.29 | R1.25 | NA |
| 1960 | 0.50 | R2.13 | 0.13 | R0.54 | 0.19 | R0.81 | 0.34 | R1.45 | 0.28 | R1.22 | R-2.7 |
| 1961 | 0.50 | R2.11 | 0.14 | R0.57 | 0.18 | R0.78 | 0.35 | R1.47 | 0.29 | R1.21 | R-0.2 |
| 1962 | 0.50 | R2.09 | 0.14 | R0.61 | 0.18 | R0.75 | 0.34 | R1.41 | 0.29 | R1.21 | R-0.6 |
| 1963 | 0.50 | R2.06 | 0.14 | R0.60 | 0.18 | R0.73 | 0.37 | R1.51 | 0.28 | R1.17 | R-3.0 |
| 1964 | 0.50 | R2.03 | 0.14 | R0.56 | 0.18 | R0.73 | 0.38 | R1.55 | 0.28 | R1.13 | R-3.3 |
| 1965 | 0.49 | R1.97 | 0.14 | R0.58 | 0.18 | R0.72 | 0.36 | R1.45 | 0.28 | R1.11 | R-2.0 |
| 1966 | 0.50 | R1.93 | 0.14 | R0.56 | 0.18 | R0.72 | 0.35 | R1.35 | 0.28 | R1.09 | R-1.7 |
| 1967 | 0.50 | R1.90 | 0.14 | R0.55 | 0.19 | R0.71 | 0.36 | R1.36 | 0.28 | R1.07 | -1.6 |
| 1968 | 0.51 | R1.83 | 0.14 | R0.52 | 0.19 | R0.69 | 0.39 | R1.42 | 0.28 | R1.03 | R-4.0 |
| 1969 | 0.53 | R1.84 | 0.15 | R0.53 | 0.20 | R0.71 | 0.44 | R1.52 | 0.30 | R1.03 | R0.2 |
| 1970 | 0.55 | R1.79 | 0.15 | R0.50 | 0.26 | R0.86 | 0.49 | R1.59 | 0.32 | R1.04 | R0.5 |
| 1971 | 0.58 | R1.81 | 0.16 | R0.51 | 0.30 | R0.94 | 0.53 | R1.65 | 0.34 | R1.06 | R1.9 |
| 1972 | 0.58 | R1.74 | 0.17 | R0.52 | 0.33 | R0.98 | 0.55 | R1.65 | 0.35 | R1.04 | R-1.0 |
| 1973 | 0.67 | R1.90 | 0.20 | R0.57 | 0.36 | R1.03 | 0.62 | R1.74 | 0.40 | R1.12 | R7.6 |
| 1974 | 1.18 | R3.08 | 0.27 | R0.71 | 0.68 | R1.77 | 1.02 | R2.65 | 0.68 | R1.76 | 56.2 |
| 1975 | 1.32 | R3.13 | 0.40 | R0.95 | 0.84 | R1.99 | 1.50 | R3.54 | 0.82 | R1.95 | 10.8 |
| 1976 | 1.41 | R3.17 | 0.53 | R1.19 | 0.85 | R1.91 | 1.54 | R3.45 | 0.90 | R2.02 | R4.0 |
| 1977 | 1.48 | R3.12 | 0.72 | R1.52 | 0.88 | R1.85 | 1.54 | R3.25 | 1.01 | R2.13 | R5.2 |
| 1978 | 1.55 | R3.04 | 0.84 | R1.64 | 0.98 | R1.92 | 1.53 | R2.99 | 1.12 | R2.19 | R2.9 |
| 1979 | 2.18 | R3.94 | 1.08 | R1.96 | 1.05 | R1.90 | 1.77 | R3.20 | 1.42 | R2.56 | R17.1 |
| 1980 | 3.72 | R6.16 | 1.45 | R2.40 | 1.09 | R1.81 | 1.86 | R3.08 | 2.04 | R3.38 | R32.0 |
| 1981 | 5.48 | R8.31 | 1.79 | R2.72 | 1.18 | R1.79 | 1.90 | R2.88 | 2.75 | R4.17 | R23.2 |
| 1982 | 4.92 | R7.01 | 2.22 | R3.17 | 1.22 | R1.74 | 2.14 | R3.05 | 2.76 | R3.93 | R-5.6 |
| 1983 | 4.52 | R6.18 | 2.32 | R3.18 | 1.17 | R1.60 | 2.30 | R3.15 | 2.70 | R3.69 | R-6.1 |
| 1984 | 4.46 | R5.88 | 2.40 | R3.16 | 1.16 | R1.53 | 2.09 | R2.75 | 2.65 | R3.49 | R-5.7 |
| 1985 | 4.15 | R5.30 | 2.26 | R2.88 | 1.15 | R1.46 | 2.04 | R2.60 | 2.51 | R3.20 | R-8.1 |
| 1986 | 2.16 | R2.68 | 1.75 | R2.17 | 1.08 | R1.34 | 1.91 | R2.37 | 1.65 | R2.05 | R-36.0 |
| 1987 | 2.65 | R3.19 | 1.50 | R1.81 | 1.05 | R1.26 | 1.89 | R2.27 | 1.70 | R2.05 | R-0.2 |
| 1988 | 2.17 | R2.52 | 1.52 | R1.77 | 1.01 | R1.17 | 1.90 | R2.20 | 1.53 | R1.78 | R-13.0 |
| 1989 | 2.73 | R3.05 | 1.53 | R1.70 | 1.00 | R1.11 | 1.84 | R2.05 | 1.67 | R1.86 | R4.7 |
| 1990 | 3.45 | R3.69 | 1.55 | R1.65 | 0.99 | R1.06 | 1.75 | R1.86 | 1.84 | R1.97 | R5.7 |
| 1991 | 2.85 | R2.93 | 1.48 | R1.52 | 0.99 | R1.02 | 1.61 | R1.66 | 1.67 | R1.72 | R-12.8 |
| 1992 | 2.76 | R2.76 | 1.57 | R1.57 | 0.97 | R0.97 | 1.52 | R1.52 | 1.66 | R1.66 | R-3.4 |
| 1993 | 2.46 | R2.40 | R1.84 | R1.80 | 0.93 | R0.90 | 1.46 | R1.42 | R1.67 | R1.63 | R-1.7 |
| 1994 | 2.27 | R2.17 | R1.70 | R1.62 | R0.91 | R0.86 | R1.60 | R1.52 | R1.54 | R1.47 | R-10.0 |
| 1995P | 2.52 | 2.35 | 1.44 | 1.34 | 0.89 | 0.83 | 1.62 | 1.50 | 1.49 | 1.39 | -5.3 |

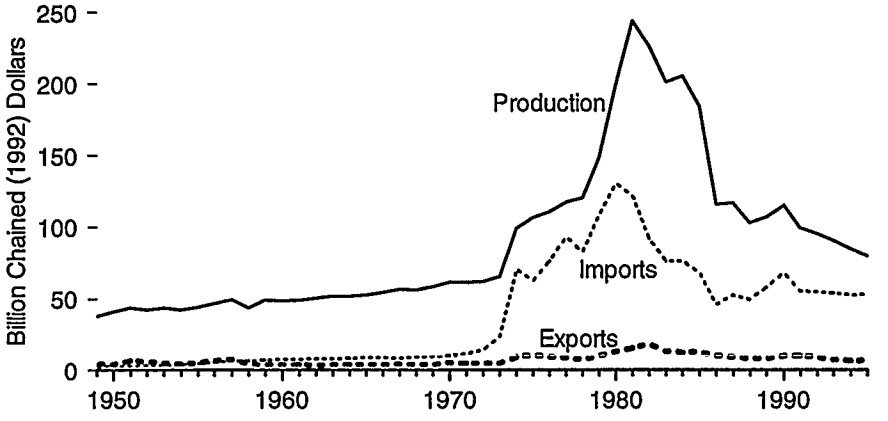
[1] Domestic first purchase prices.
[2] Wellhead prices.
[3] Prices are free-on-board (f.o.b.) mines.
[4] Through 1978, prices are f.o.b. preparation plants; for 1979 forward, prices are f.o.b. mines.
[5] Derived by multiplying the price per Btu of each fossil fuel by the total Btu content of the production of each fossil fuel and dividing this accumulated value of total fossil fuel production by the accumulated Btu content of total fossil fuel production.
[6] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[7] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal values to real (inflation-adjusted) values, were not available in time to use in this report.

R=Revised data. P=Preliminary data. — = Not applicable. NA=Not available.

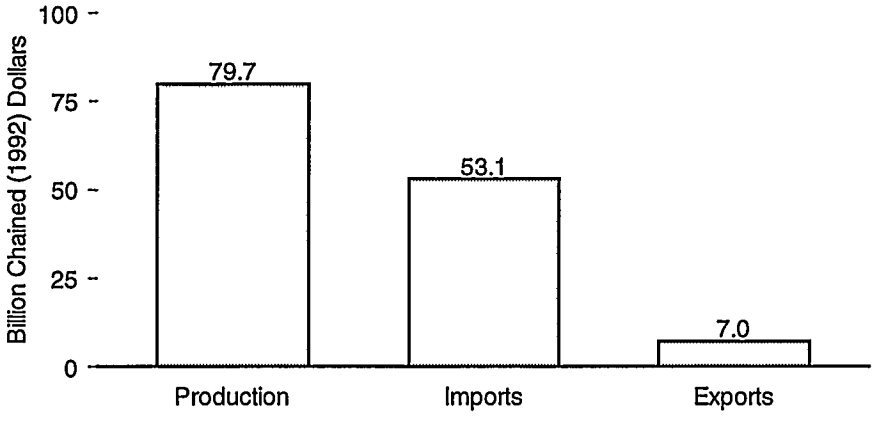
Sources: Tables 5.16, 6.8, and 7.8 and Appendices A and E.

# Figure 3.2 Value of Fossil Fuel Production

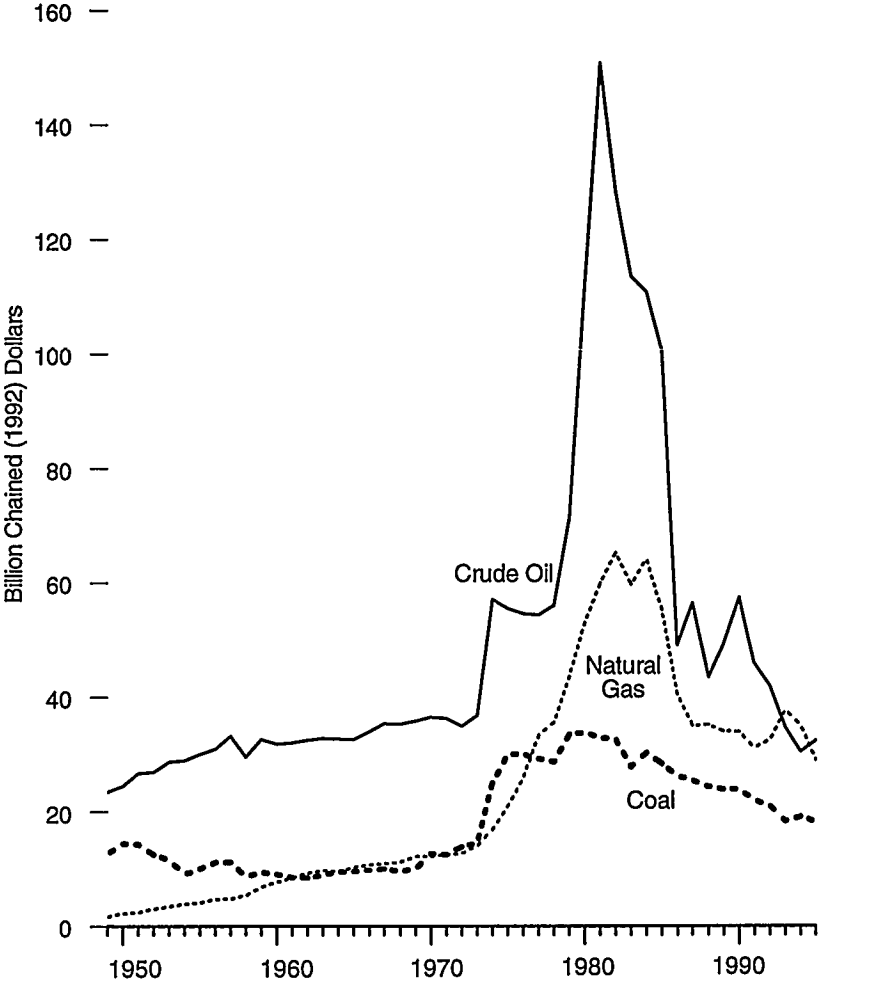
### Overview, 1949-1995




### Overview, 1995




### Production by Fuel, 1949-1995




Notes: • Prices are in chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 3.2, 3.3, and 3.4.

# Table 3.2 Value of Fossil Fuel Production, 1949-1995

(Billion Dollars)

| Year | Crude Oil [1] | | Natural Gas (Marketed Production) | | Coal | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Bituminous Coal, Subbituminous Coal, and Lignite | | Anthracite | | Total | | | |
| | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] |
| 1949 | 4.68 | [3] | 0.33 | [3] | 2.14 | [3] | 0.38 | [3] | 2.52 | [3] | 7.53 | [3] |
| 1950 | 4.95 | [3] | 0.44 | [3] | 2.50 | [3] | 0.41 | [3] | 2.91 | [3] | 8.30 | [3] |
| 1951 | 5.69 | [3] | 0.52 | [3] | 2.63 | [3] | 0.42 | [3] | 3.05 | [3] | 9.26 | [3] |
| 1952 | 5.79 | [3] | 0.64 | [3] | 2.29 | [3] | 0.39 | [3] | 2.68 | [3] | 9.11 | [3] |
| 1953 | 6.32 | [3] | 0.76 | [3] | 2.25 | [3] | 0.31 | [3] | 2.56 | [3] | 9.64 | [3] |
| 1954 | 6.44 | [3] | 0.87 | [3] | 1.77 | [3] | 0.25 | [3] | 2.02 | [3] | 9.33 | [3] |
| 1955 | 6.88 | [3] | 0.94 | [3] | 2.09 | [3] | 0.21 | [3] | 2.30 | [3] | 10.12 | [3] |
| 1956 | 7.30 | [3] | 1.11 | [3] | 2.41 | [3] | 0.24 | [3] | 2.65 | [3] | 11.06 | [3] |
| 1957 | 8.09 | [3] | 1.17 | [3] | 2.50 | [3] | 0.23 | [3] | 2.73 | [3] | 11.99 | [3] |
| 1958 | 7.37 | [3] | 1.32 | [3] | 1.99 | [3] | 0.19 | [3] | 2.18 | [3] | 10.87 | [3] |
| 1959 | 7.47 | R32.62 | 1.57 | R6.86 | 1.97 | R8.60 | 0.18 | R0.79 | 2.15 | R9.39 | 11.19 | R48.87 |
| 1960 | 7.42 | R31.85 | 1.79 | R7.68 | 1.95 | R8.37 | 0.15 | R0.64 | 2.10 | R9.01 | 11.31 | R48.54 |
| 1961 | 7.58 | R32.12 | 1.99 | R8.43 | 1.85 | R7.84 | 0.14 | R0.59 | 1.99 | R8.43 | 11.56 | R48.98 |
| 1962 | 7.76 | R32.47 | 2.22 | R9.29 | 1.89 | R7.91 | 0.13 | R0.54 | 2.02 | R8.45 | 12.00 | R50.21 |
| 1963 | 7.96 | R32.89 | 2.36 | R9.75 | 2.01 | R8.31 | 0.16 | R0.66 | 2.17 | R8.97 | 12.49 | R51.61 |
| 1964 | 8.03 | R32.78 | 2.33 | R9.51 | 2.17 | R8.86 | 0.15 | R0.61 | 2.32 | R9.47 | 12.68 | R51.76 |
| 1965 | 8.15 | R32.60 | 2.57 | R10.28 | 2.27 | R9.08 | 0.13 | R0.52 | 2.40 | R9.60 | 13.12 | R52.48 |
| 1966 | 8.72 | R33.93 | 2.75 | R10.70 | 2.42 | R9.42 | 0.10 | R0.39 | 2.52 | R9.81 | 13.99 | R54.44 |
| 1967 | 9.39 | R35.43 | 2.91 | R10.98 | 2.55 | R9.62 | 0.10 | R0.38 | 2.65 | R10.00 | 14.95 | R56.41 |
| 1968 | 9.79 | R35.34 | 3.09 | R11.16 | 2.55 | R9.21 | 0.10 | R0.36 | 2.65 | R9.57 | 15.53 | R56.07 |
| 1969 | 10.42 | R35.93 | 3.52 | R12.14 | 2.80 | R9.66 | 0.10 | R0.34 | 2.90 | R10.00 | 16.84 | R58.07 |
| 1970 | 11.19 | R36.57 | 3.73 | R12.19 | 3.77 | R12.32 | 0.11 | R0.36 | 3.88 | R12.68 | 18.80 | R61.44 |
| 1971 | 11.71 | R36.37 | 4.05 | R12.58 | 3.90 | R12.11 | 0.11 | R0.34 | 4.01 | R12.45 | 19.77 | R61.40 |
| 1972 | 11.71 | R34.96 | 4.28 | R12.78 | 4.56 | R13.61 | 0.09 | R0.27 | 4.65 | R13.88 | 20.64 | R61.62 |
| 1973 | 13.07 | R36.92 | 4.98 | R14.07 | 5.05 | R14.27 | 0.09 | R0.25 | 5.14 | R14.52 | 23.19 | R65.51 |
| 1974 | 22.00 | R57.14 | 6.48 | R16.83 | 9.50 | R24.68 | 0.15 | R0.39 | 9.65 | R25.07 | 38.13 | R99.04 |
| 1975 | 23.45 | R55.57 | 8.85 | R20.97 | 12.47 | R29.55 | 0.20 | R0.47 | 12.67 | R30.02 | 44.97 | R106.56 |
| 1976 | 24.37 | R54.64 | 11.57 | R25.94 | 13.19 | R29.57 | 0.21 | R0.47 | 13.40 | R30.04 | 49.34 | R110.62 |
| 1977 | 25.79 | R54.41 | 15.82 | R33.38 | 13.70 | R28.90 | 0.20 | R0.42 | 13.90 | R29.32 | 55.51 | R117.11 |
| 1978 | 28.60 | R56.08 | 18.18 | R35.65 | 14.49 | R28.41 | 0.18 | R0.35 | 14.67 | R28.76 | 61.45 | R120.49 |
| 1979 | 39.45 | R71.34 | 24.16 | R43.69 | 18.36 | R33.20 | 0.20 | R0.36 | 18.56 | R33.56 | 82.17 | R148.59 |
| 1980 | 67.93 | R112.47 | 32.09 | R53.13 | 20.20 | R33.44 | 0.26 | R0.43 | 20.46 | R33.87 | 120.48 | R199.47 |
| 1981 | 99.40 | R150.83 | 39.51 | R59.95 | 21.51 | R32.64 | 0.24 | R0.36 | 21.75 | R33.00 | 160.66 | R243.78 |
| 1982 | 90.03 | R128.43 | 45.71 | R65.21 | 22.62 | R32.27 | 0.23 | R0.33 | 22.85 | R32.60 | 158.59 | R226.24 |
| 1983 | 83.05 | R113.61 | 43.73 | R59.82 | 20.11 | R27.51 | 0.21 | R0.29 | 20.32 | R27.80 | 147.10 | R201.23 |
| 1984 | 84.10 | R110.80 | 48.69 | R64.15 | 22.75 | R29.97 | 0.20 | R0.26 | 22.95 | R30.23 | 155.74 | R205.18 |
| 1985 | 78.88 | R100.61 | 43.35 | R55.29 | 22.06 | R28.14 | 0.22 | R0.28 | 22.28 | R28.42 | 144.51 | R184.32 |
| 1986 | 39.63 | R49.17 | 32.71 | R40.58 | 21.00 | R26.05 | 0.19 | R0.24 | 21.19 | R26.29 | 93.53 | R116.04 |
| 1987 | 46.93 | R56.47 | 29.11 | R35.03 | 21.05 | R25.33 | 0.16 | R0.19 | 21.21 | R25.52 | 97.25 | R117.02 |
| 1988 | 37.48 | R43.53 | 30.28 | R35.17 | 20.83 | R24.19 | 0.16 | R0.19 | 20.99 | R24.38 | 88.75 | R103.08 |
| 1989 | 44.07 | R49.13 | 30.58 | R34.09 | 21.27 | R23.71 | 0.14 | R0.16 | 21.41 | R23.87 | 96.06 | R107.09 |
| 1990 | 53.77 | R57.45 | 31.80 | R33.97 | 22.27 | R23.79 | 0.14 | R0.15 | 22.41 | R23.94 | 107.98 | R115.36 |
| 1991 | 44.77 | R46.01 | 30.39 | R31.23 | 21.29 | R21.88 | 0.13 | R0.13 | 21.42 | R22.01 | 96.58 | R99.25 |
| 1992 | 41.97 | R41.97 | 32.56 | R32.56 | 20.86 | R20.86 | 0.12 | R0.12 | 20.98 | R20.98 | 95.51 | R95.51 |
| 1993 | 35.61 | R34.71 | R38.72 | R37.74 | 18.62 | R18.15 | 0.14 | R0.14 | 18.76 | R18.29 | R93.09 | R90.74 |
| 1994 | R32.07 | R30.54 | R36.91 | R35.15 | R19.91 | R18.96 | R0.17 | R0.16 | R20.08 | R19.12 | R89.06 | R84.81 |
| 1995P | 34.85 | 32.42 | 31.20 | 29.02 | 19.49 | 18.13 | 0.15 | 0.14 | 19.64 | 18.27 | 85.69 | 79.71 |

[1] Includes lease condensate.

[2] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[3] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal values to real (inflation-adjusted) values, were not available in time to use in this report.

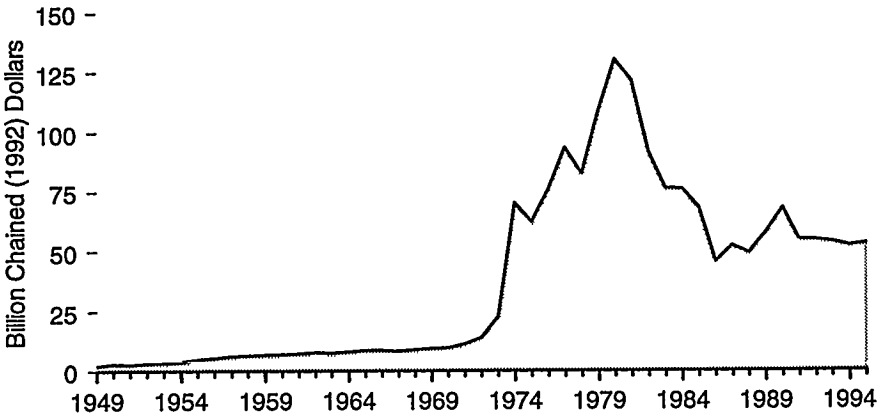
R=Revised data. P=Preliminary data.

Note: Value is based on fuel prices taken as closely as possible to the point of production.

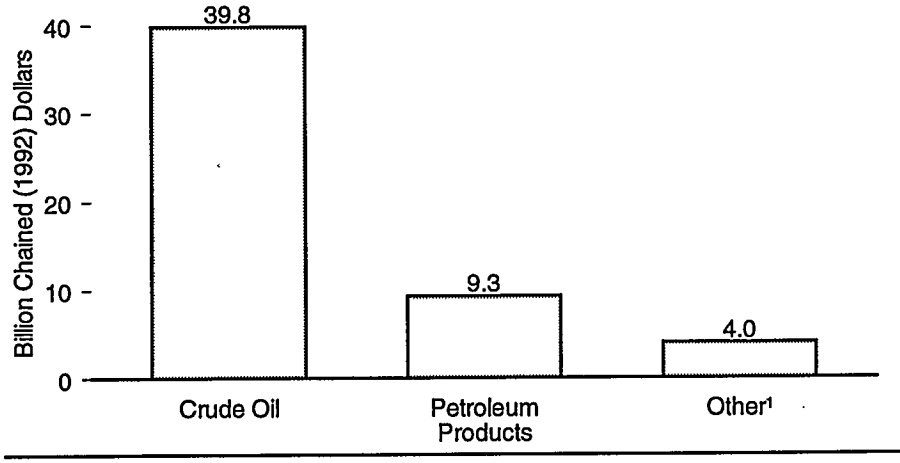
Sources: Tables 5.1, 5.16, 6.2, 6.8, 7.2, and 7.8 and Appendix E.

# Figure 3.3 Value of Fossil Fuel Imports

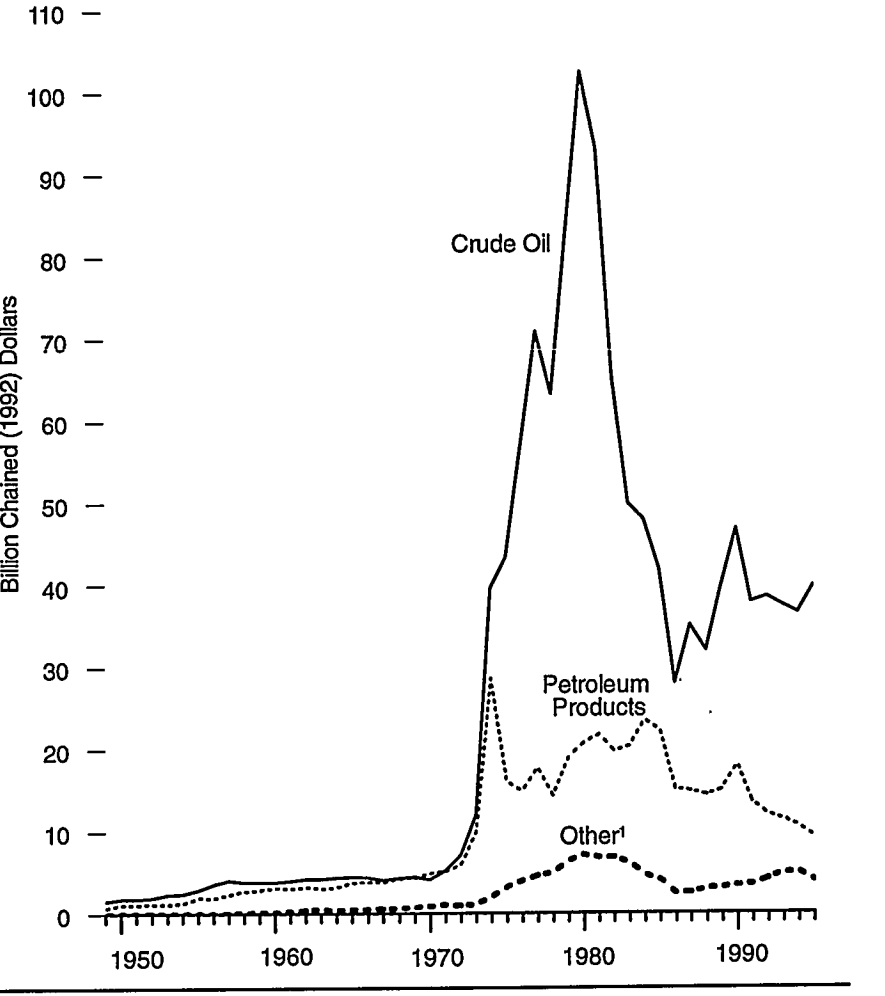
**Total, 1949-1995**




**By Fuel, 1995**




**By Fuel, 1949-1995**




¹ "Other" is natural gas, coal, and coke.

Notes: • Prices are in chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E. • Because vertical scales differ, graphs should not be compared.

Source: Table 3.3.

# Table 3.3 Value of Fossil Fuel Imports, 1949-1995

(Billion Dollars)

| Year | Coal | | Coal Coke | | Natural Gas | | Crude Oil [1] | | Petroleum Products | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] |
| 1949 | (s) | [3] | (s) | [3] | 0.00 | [3] | 0.30 | [3] | 0.14 | [3] | 0.45 | [3] |
| 1950 | (s) | [3] | 0.01 | [3] | 0.00 | [3] | 0.37 | [3] | 0.21 | [3] | 0.59 | [3] |
| 1951 | (s) | [3] | (s) | [3] | 0.00 | [3] | 0.37 | [3] | 0.23 | [3] | 0.61 | [3] |
| 1952 | (s) | [3] | (s) | [3] | (s) | [3] | 0.42 | [3] | 0.25 | [3] | 0.68 | [3] |
| 1953 | (s) | [3] | (s) | [3] | (s) | [3] | 0.51 | [3] | 0.25 | [3] | 0.77 | [3] |
| 1954 | (s) | [3] | (s) | [3] | (s) | [3] | 0.54 | [3] | 0.28 | [3] | 0.83 | [3] |
| 1955 | (s) | [3] | (s) | [3] | (s) | [3] | 0.65 | [3] | 0.44 | [3] | 1.10 | [3] |
| 1956 | (s) | [3] | (s) | [3] | (s) | [3] | 0.84 | [3] | 0.45 | [3] | 1.29 | [3] |
| 1957 | (s) | [3] | (s) | [3] | (s) | [3] | 0.98 | [3] | 0.57 | [3] | 1.56 | [3] |
| 1958 | (s) | [3] | (s) | [3] | 0.02 | [3] | 0.94 | [3] | 0.68 | [3] | 1.65 | [3] |
| 1959 | (s) | 0.01 | (s) | 0.01 | 0.03 | R0.11 | 0.87 | R3.81 | 0.66 | R2.89 | 1.57 | R6.84 |
| 1960 | (s) | 0.01 | (s) | 0.01 | 0.03 | R0.12 | 0.90 | R3.84 | 0.73 | R3.14 | 1.66 | R7.12 |
| 1961 | (s) | 0.01 | (s) | 0.01 | 0.04 | R0.19 | 0.93 | R3.95 | 0.71 | R3.01 | 1.69 | R7.17 |
| 1962 | (s) | 0.01 | (s) | 0.01 | 0.09 | R0.36 | 1.01 | R4.23 | 0.75 | R3.15 | 1.86 | R7.76 |
| 1963 | (s) | 0.01 | (s) | 0.01 | 0.10 | R0.41 | 1.03 | R4.24 | 0.74 | R3.05 | 1.87 | R7.71 |
| 1964 | (s) | 0.01 | (s) | 0.01 | 0.10 | R0.41 | 1.08 | R4.41 | 0.78 | R3.20 | 1.97 | R8.03 |
| 1965 | (s) | 0.01 | (s) | R0.01 | 0.11 | R0.42 | 1.12 | R4.48 | 0.92 | R3.69 | 2.15 | R8.61 |
| 1966 | (s) | 0.01 | (s) | 0.01 | 0.11 | R0.41 | 1.12 | R4.34 | 0.99 | R3.84 | 2.21 | R8.61 |
| 1967 | (s) | 0.01 | (s) | 0.01 | 0.13 | R0.49 | 1.06 | R4.02 | 1.02 | R3.83 | 2.21 | R8.35 |
| 1968 | (s) | 0.01 | (s) | 0.01 | 0.15 | R0.53 | 1.18 | R4.27 | 1.16 | R4.20 | 2.50 | R9.02 |
| 1969 | (s) | (s) | (s) | 0.01 | 0.20 | R0.67 | 1.30 | R4.48 | 1.24 | R4.27 | 2.74 | R9.44 |
| 1970 | (s) | (s) | (s) | 0.01 | 0.26 | R0.84 | 1.26 | R4.12 | 1.48 | R4.84 | 3.00 | R9.82 |
| 1971 | (s) | R0.01 | 0.01 | R0.02 | 0.31 | R0.97 | 1.69 | R5.24 | 1.66 | R5.14 | 3.66 | R11.37 |
| 1972 | (s) | (s) | (s) | 0.01 | 0.31 | R0.94 | 2.37 | R7.07 | 1.99 | R5.94 | 4.68 | R13.97 |
| 1973 | (s) | (s) | 0.04 | R0.11 | 0.36 | R1.02 | 4.24 | R11.98 | 3.50 | R9.88 | 8.14 | R23.00 |
| 1974 | 0.06 | R0.15 | 0.19 | R0.50 | 0.53 | R1.38 | 15.25 | R39.62 | 11.01 | R28.61 | 27.05 | R70.25 |
| 1975 | 0.02 | R0.05 | 0.16 | R0.37 | 1.15 | R2.73 | 18.29 | R43.34 | 6.77 | R16.04 | 26.39 | R62.53 |
| 1976 | 0.02 | R0.04 | 0.11 | R0.25 | 1.66 | R3.72 | 25.46 | R57.08 | 6.65 | R14.91 | 33.90 | R76.00 |
| 1977 | 0.04 | R0.08 | 0.13 | R0.28 | 2.00 | R4.22 | 33.59 | R70.87 | 8.42 | R17.76 | 44.18 | R93.20 |
| 1978 | 0.07 | R0.15 | 0.41 | R0.80 | 2.06 | R4.04 | 32.30 | R63.33 | 7.30 | R14.32 | 42.15 | R82.64 |
| 1979 | 0.05 | R0.09 | 0.34 | R0.61 | 3.13 | R5.65 | 46.06 | R83.29 | 10.45 | R18.90 | 60.03 | R108.55 |
| 1980 | 0.03 | R0.05 | 0.05 | R0.09 | 4.21 | R6.98 | 61.90 | R102.48 | 12.54 | R20.76 | 78.74 | R130.36 |
| 1981 | 0.03 | R0.05 | 0.04 | R0.07 | 4.41 | R6.70 | 61.46 | R93.26 | 14.30 | R21.70 | 80.24 | R121.76 |
| 1982 | 0.02 | 0.03 | 0.01 | 0.01 | 4.69 | R6.70 | 45.72 | R65.23 | 13.86 | R19.78 | 64.31 | R91.74 |
| 1983 | 0.04 | R0.06 | (s) | (s) | 4.39 | R6.00 | 36.49 | R49.92 | 14.84 | R20.30 | 55.77 | R76.29 |
| 1984 | 0.05 | R0.06 | 0.05 | R0.06 | 3.44 | R4.53 | 36.44 | R48.02 | 17.87 | R23.54 | 57.84 | R76.21 |
| 1985 | 0.07 | R0.09 | 0.04 | 0.05 | 3.05 | R3.89 | 32.90 | R41.97 | 17.47 | R22.28 | 53.53 | R68.28 |
| 1986 | 0.08 | R0.10 | 0.03 | 0.03 | 1.82 | R2.26 | 22.61 | R28.05 | 12.18 | R15.11 | 36.72 | R45.55 |
| 1987 | 0.06 | R0.07 | 0.05 | R0.07 | 1.93 | R2.32 | 29.13 | R35.05 | 12.37 | R14.88 | 43.54 | R52.39 |
| 1988 | 0.06 | R0.07 | 0.19 | R0.22 | 2.38 | R2.76 | 27.55 | R31.99 | 12.43 | R14.44 | 42.62 | R49.50 |
| 1989 | 0.10 | R0.11 | 0.22 | R0.24 | 2.51 | R2.79 | 35.53 | R39.61 | 13.50 | R15.05 | 51.85 | R57.80 |
| 1990 | 0.09 | R0.10 | 0.07 | R0.08 | 2.97 | R3.18 | 43.78 | R46.78 | 16.90 | R18.06 | 63.83 | R68.19 |
| 1991 | 0.11 | R0.12 | 0.09 | R0.10 | 3.24 | R3.33 | 36.90 | R37.93 | 13.17 | R13.54 | 53.51 | R55.00 |
| 1992 | 0.13 | R0.13 | 0.14 | R0.14 | 3.96 | R3.96 | 38.55 | R38.55 | 11.98 | R11.98 | 54.77 | R54.77 |
| 1993 | 0.22 | R0.21 | 0.12 | R0.11 | R4.75 | R4.63 | 38.47 | R37.49 | 11.74 | R11.44 | R55.29 | R53.89 |
| 1994 | 0.23 | R0.22 | 0.13 | R0.13 | R4.88 | R4.65 | R38.48 | R36.65 | R11.14 | R10.61 | R54.86 | R52.25 |
| 1995[P] | 0.25 | 0.23 | 0.16 | 0.15 | 3.88 | 3.61 | 42.80 | 39.81 | 9.97 | 9.27 | 57.06 | 53.07 |

[1] Includes imports into the Strategic Petroleum Reserve, which began in 1977.

[2] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[3] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal values to real (inflation-adjusted) values, were not available in time to use in this report.

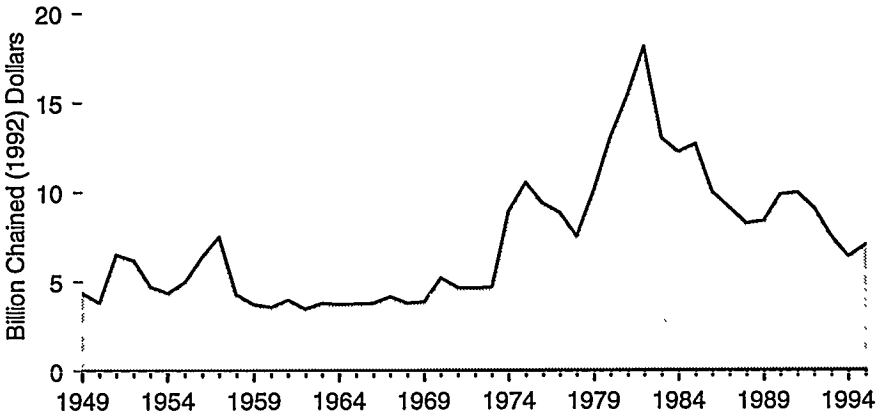
R=Revised data. P=Preliminary data. (s)=Less than $5 million.

Notes: • Includes value of imports into Puerto Rico from foreign countries; excludes receipts into the 50 States and the District of Columbia from the Virgin Islands and Puerto Rico. • Totals may not equal sum of components due to independent rounding.

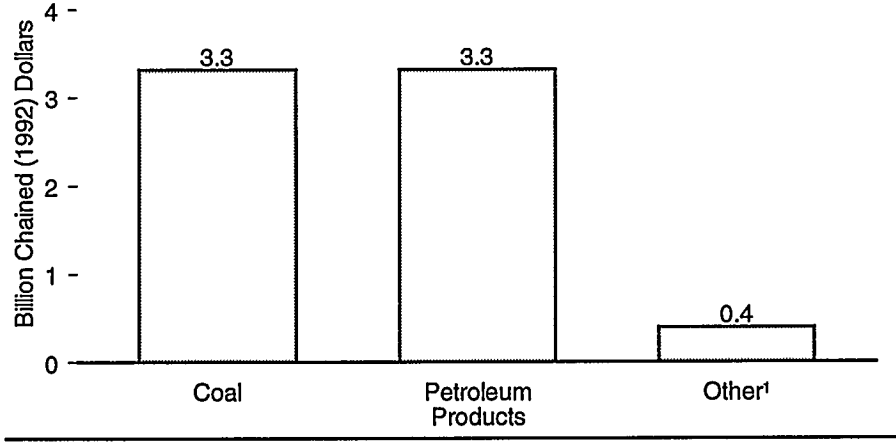
Sources: **Natural Gas:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1971—Bureau of the Census, *U.S. Imports for Consumption and General Imports*, FT246. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual. • 1982-1994—EIA, *Natural Gas Monthly*. • 1995—EIA estimates. **All Other Data:** • 1949-1962—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT110. • 1963—Bureau of the Census, *U.S. Imports of Merchandise for Consumption*, FT125. • 1964-1988—Bureau of the Census, *U.S. Imports for Consumption*, FT135. • 1989-1993—Bureau of the Census, *Advanced Report on U.S. Merchandise Trade*, FT900 Adv. (94-12).• 1994-1995—Bureau of the Census, *U.S. International Trade in Goods and Services*, FT900 Adv. (95-12).

# Figure 3.4 Value of Fossil Fuel Exports

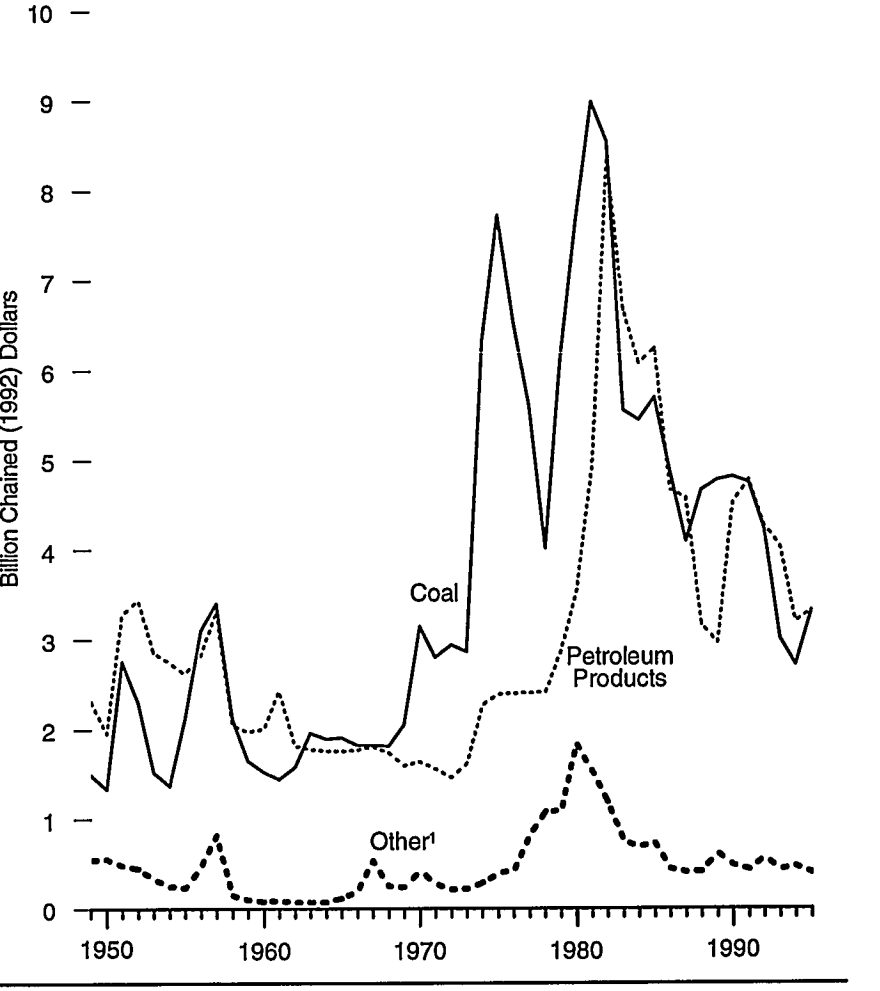
**Total, 1949-1995**




**By Fuel, 1995**




**By Fuel, 1949-1995**




[1] "Other" is natural gas, crude oil, and coal coke.

Notes: • Prices are in chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E. • Because vertical scales differ, graphs should not be compared.

Source: Table 3.4.

# Table 3.4 Value of Fossil Fuel Exports, 1949-1995

(Billion Dollars)

| Year | Coal | | Coal Coke | | Natural Gas | | Crude Oil | | Petroleum Products | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] |
| 1949 | 0.30 | ([2]) | 0.01 | ([2]) | (s) | ([2]) | 0.10 | ([2]) | 0.46 | ([2]) | 0.87 | ([2]) |
| 1950 | 0.27 | ([2]) | 0.01 | ([2]) | (s) | ([2]) | 0.10 | ([2]) | 0.39 | ([2]) | 0.78 | ([2]) |
| 1951 | 0.59 | ([2]) | 0.02 | ([2]) | (s) | ([2]) | 0.08 | ([2]) | 0.70 | ([2]) | 1.39 | ([2]) |
| 1952 | 0.49 | ([2]) | 0.01 | ([2]) | (s) | ([2]) | 0.08 | ([2]) | 0.74 | ([2]) | 1.33 | ([2]) |
| 1953 | 0.34 | ([2]) | 0.01 | ([2]) | (s) | ([2]) | 0.06 | ([2]) | 0.63 | ([2]) | 1.04 | ([2]) |
| 1954 | 0.30 | ([2]) | 0.01 | ([2]) | (s) | ([2]) | 0.05 | ([2]) | 0.61 | ([2]) | 0.97 | ([2]) |
| 1955 | 0.48 | ([2]) | 0.01 | ([2]) | 0.01 | ([2]) | 0.04 | ([2]) | 0.60 | ([2]) | 1.14 | ([2]) |
| 1956 | 0.73 | ([2]) | 0.01 | ([2]) | 0.01 | ([2]) | 0.09 | ([2]) | 0.67 | ([2]) | 1.51 | ([2]) |
| 1957 | 0.83 | ([2]) | 0.01 | ([2]) | 0.01 | ([2]) | 0.17 | ([2]) | 0.81 | ([2]) | 1.84 | ([2]) |
| 1958 | 0.53 | ([2]) | 0.01 | ([2]) | 0.01 | ([2]) | 0.01 | ([2]) | 0.51 | ([2]) | 1.07 | ([2]) |
| 1959 | 0.38 | R1.65 | 0.01 | R0.04 | 0.01 | R0.03 | 0.01 | 0.03 | 0.45 | R1.97 | 0.85 | R3.72 |
| 1960 | 0.35 | R1.52 | 0.01 | 0.03 | (s) | R0.02 | 0.01 | 0.03 | 0.47 | R2.00 | 0.84 | R3.60 |
| 1961 | 0.34 | R1.45 | 0.01 | 0.03 | (s) | R0.02 | 0.01 | R0.04 | 0.57 | R2.43 | 0.93 | R3.96 |
| 1962 | 0.38 | R1.58 | 0.01 | 0.03 | (s) | R0.02 | 0.01 | 0.02 | 0.43 | R1.81 | 0.83 | R3.46 |
| 1963 | 0.47 | R1.96 | 0.01 | 0.03 | (s) | 0.02 | (s) | 0.02 | 0.43 | R1.77 | 0.92 | R3.80 |
| 1964 | 0.46 | R1.89 | 0.01 | 0.04 | (s) | 0.02 | (s) | R0.02 | 0.43 | R1.75 | 0.91 | R3.72 |
| 1965 | 0.48 | R1.91 | 0.02 | R0.07 | 0.01 | 0.03 | (s) | 0.02 | 0.44 | R1.76 | 0.95 | R3.78 |
| 1966 | 0.47 | R1.82 | 0.02 | R0.09 | 0.02 | R0.07 | 0.01 | R0.04 | 0.46 | R1.77 | 0.97 | R3.79 |
| 1967 | 0.48 | R1.82 | 0.02 | R0.06 | 0.03 | R0.12 | 0.09 | R0.35 | 0.48 | R1.81 | 1.10 | R4.16 |
| 1968 | 0.50 | R1.81 | 0.02 | R0.07 | 0.04 | R0.14 | 0.01 | 0.04 | 0.48 | R1.74 | 1.05 | R3.80 |
| 1969 | 0.59 | R2.05 | 0.04 | R0.13 | 0.03 | R0.09 | 0.01 | 0.02 | 0.46 | R1.59 | 1.13 | R3.88 |
| 1970 | 0.96 | R3.14 | 0.08 | R0.26 | 0.03 | R0.10 | 0.02 | R0.06 | 0.50 | R1.64 | 1.59 | R5.20 |
| 1971 | 0.90 | R2.80 | 0.04 | R0.14 | 0.04 | R0.12 | 0.01 | 0.02 | 0.50 | R1.56 | 1.49 | R4.64 |
| 1972 | 0.98 | R2.94 | 0.03 | R0.09 | 0.04 | R0.12 | (s) | R0.01 | 0.49 | R1.46 | 1.55 | R4.61 |
| 1973 | 1.01 | R2.86 | 0.03 | R0.09 | 0.04 | R0.12 | (s) | 0.01 | 0.57 | R1.62 | 1.66 | R4.70 |
| 1974 | 2.44 | R6.33 | 0.04 | R0.11 | 0.05 | R0.14 | 0.01 | R0.04 | 0.87 | R2.27 | 3.42 | R8.89 |
| 1975 | 3.26 | R7.72 | 0.07 | R0.18 | 0.09 | R0.22 | (s) | (s) | 1.01 | R2.39 | 4.43 | R10.50 |
| 1976 | 2.91 | R6.53 | 0.07 | R0.15 | 0.10 | R0.23 | 0.03 | R0.06 | 1.07 | R2.40 | 4.17 | R9.36 |
| 1977 | 2.66 | R5.60 | 0.07 | R0.15 | 0.11 | R0.23 | 0.21 | R0.44 | 1.14 | R2.40 | 4.18 | R8.82 |
| 1978 | 2.05 | R4.02 | 0.05 | R0.10 | 0.11 | R0.22 | 0.39 | R0.76 | 1.23 | R2.42 | 3.83 | R7.51 |
| 1979 | 3.40 | R6.14 | 0.08 | R0.15 | 0.13 | R0.23 | 0.39 | R0.71 | 1.58 | R2.86 | 5.58 | R10.10 |
| 1980 | 4.63 | R7.66 | 0.13 | R0.22 | 0.23 | R0.38 | 0.75 | R1.24 | 2.12 | R3.51 | 7.86 | R13.01 |
| 1981 | 5.92 | R8.98 | 0.07 | R0.11 | 0.35 | R0.53 | 0.58 | R0.88 | 3.24 | R4.91 | 10.16 | R15.41 |
| 1982 | 5.99 | R8.55 | 0.06 | R0.09 | 0.30 | R0.43 | 0.47 | R0.67 | 5.86 | R8.36 | 12.68 | R18.09 |
| 1983 | 4.06 | R5.55 | 0.05 | R0.06 | 0.28 | R0.38 | 0.22 | R0.31 | 4.88 | R6.67 | 9.48 | R12.97 |
| 1984 | 4.13 | R5.44 | 0.07 | R0.09 | 0.27 | R0.35 | 0.19 | R0.24 | 4.62 | R6.08 | 9.27 | R12.22 |
| 1985 | 4.47 | R5.70 | 0.08 | R0.10 | 0.26 | R0.34 | 0.23 | R0.29 | 4.90 | R6.24 | 9.93 | R12.66 |
| 1986 | 3.93 | R4.88 | 0.07 | R0.08 | 0.17 | R0.21 | 0.12 | R0.15 | 3.77 | R4.67 | 8.05 | R9.99 |
| 1987 | 3.40 | R4.10 | 0.05 | R0.06 | 0.17 | R0.20 | 0.13 | R0.15 | 3.80 | R4.57 | 7.54 | R9.07 |
| 1988 | 4.01 | R4.66 | 0.08 | R0.09 | 0.20 | R0.23 | 0.08 | R0.09 | 2.72 | R3.16 | 7.09 | R8.24 |
| 1989 | 4.29 | R4.78 | 0.08 | R0.09 | 0.27 | R0.30 | 0.21 | R0.23 | 2.65 | R2.96 | 7.49 | R8.35 |
| 1990 | 4.51 | R4.82 | 0.05 | R0.05 | 0.27 | R0.28 | 0.14 | R0.15 | 4.23 | R4.52 | 9.20 | R9.82 |
| 1991 | 4.62 | R4.75 | 0.05 | R0.05 | 0.33 | R0.34 | 0.03 | 0.03 | 4.65 | R4.78 | 9.69 | R9.96 |
| 1992 | 4.24 | R4.24 | 0.04 | 0.04 | 0.49 | R0.49 | 0.03 | 0.03 | 4.27 | R4.27 | 9.07 | R9.07 |
| 1993 | 3.09 | R3.01 | 0.06 | R0.06 | 0.36 | R0.35 | 0.02 | 0.02 | 4.15 | R4.04 | 7.68 | R7.48 |
| 1994 | 2.85 | R2.71 | 0.04 | R0.04 | R0.40 | R0.39 | R0.05 | R0.05 | 3.36 | R3.20 | R6.70 | R6.39 |
| 1995P | 3.57 | 3.32 | 0.05 | 0.05 | 0.38 | 0.35 | (s) | (s) | 3.56 | 3.31 | 7.55 | 7.03 |

[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[2] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal values to real (inflation-adjusted) values, were not available in time to use in this report.

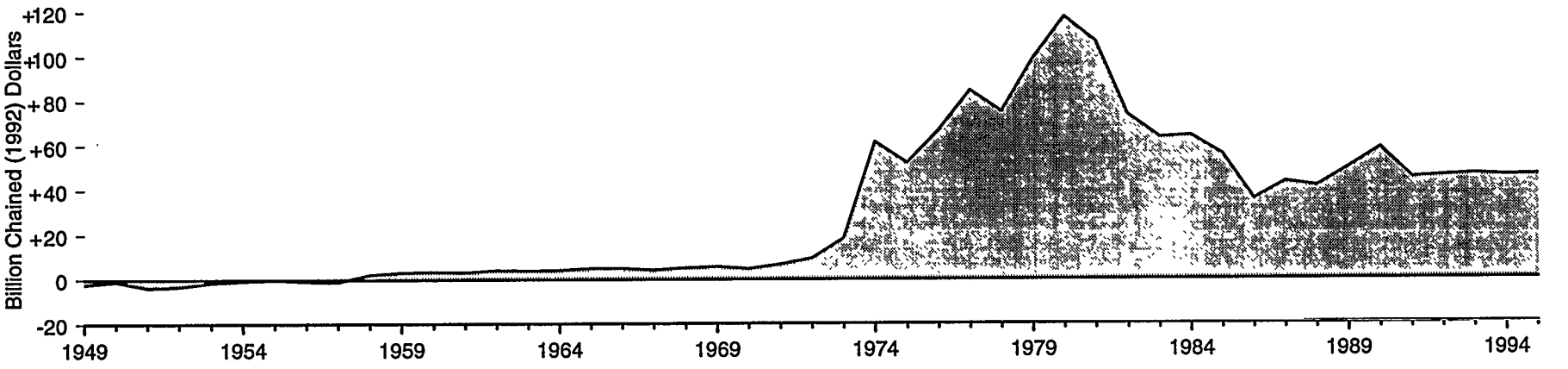
R=Revised data. P=Preliminary data. (s)=Less than $5 million.

Notes: • Includes value of exports from Puerto Rico to foreign countries; excludes shipments from the 50 States and the District of Columbia to the Virgin Islands and Puerto Rico. • Totals may not equal sum of components due to independent rounding.

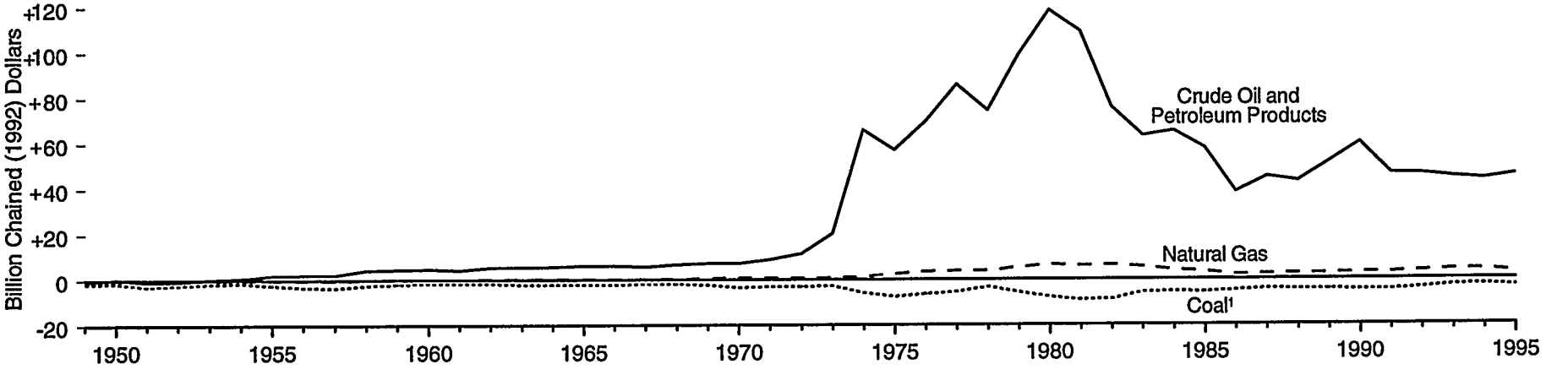
Sources: **Natural Gas:** • 1949-1971—Bureau of the Census, *U.S. Exports*, FT410. • 1972 and 1973—Federal Power Commission, *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG*. • 1974-1977—Federal Power Commission, *United States Imports and Exports of Natural Gas*, annual. • 1978-1981—Energy Information Administration (EIA), *U.S. Imports and Exports of Natural Gas*, annual. • 1982-1994—EIA, *Natural Gas Monthly*. • 1995—EIA estimates. **All Other Data:** • 1949-1988—Bureau of the Census, *U.S. Exports*, FT410. • 1989-1993—Bureau of the Census, *Advanced Report on U.S. Merchandise Trade*, FT900 Adv. (94-12).• 1994-1995—Bureau of the Census, *U.S. International Trade in Goods and Services*, FT900 Adv. (95-12).

## Figure 3.5 Value of Fossil Fuel Net Imports, 1949-1995

**Value of Fossil Fuel Net Imports**




**Value of Fossil Fuel Net Imports by Fuel**




[1] Includes small amounts of coal coke.

Notes: • Negative net imports are net exports. • Prices are in chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Source: Table 3.5.

# Table 3.5 Value of Fossil Fuel Net Imports, 1949-1995

(Billion Dollars)

| Year | Coal | | Coal Coke | | Natural Gas | | Crude Oil | | Petroleum Products | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] |
| 1949 | -0.29 | [2] | (s) | [2] | (s) | [2] | 0.21 | [2] | -0.32 | [2] | -0.42 | [2] |
| 1950 | -0.27 | [2] | (s) | [2] | (s) | [2] | 0.27 | [2] | -0.18 | [2] | -0.18 | [2] |
| 1951 | -0.58 | [2] | -0.02 | [2] | (s) | [2] | 0.29 | [2] | -0.47 | [2] | -0.78 | [2] |
| 1952 | -0.49 | [2] | -0.01 | [2] | (s) | [2] | 0.34 | [2] | -0.49 | [2] | -0.65 | [2] |
| 1953 | -0.33 | [2] | -0.01 | [2] | (s) | [2] | 0.45 | [2] | -0.38 | [2] | -0.27 | [2] |
| 1954 | -0.30 | [2] | (s) | [2] | (s) | [2] | 0.50 | [2] | -0.32 | [2] | -0.14 | [2] |
| 1955 | -0.48 | [2] | -0.01 | [2] | -0.01 | [2] | 0.62 | [2] | -0.16 | [2] | -0.04 | [2] |
| 1956 | -0.73 | [2] | -0.01 | [2] | -0.01 | [2] | 0.75 | [2] | -0.22 | [2] | -0.22 | [2] |
| 1957 | -0.83 | [2] | -0.01 | [2] | -0.01 | [2] | 0.81 | [2] | -0.24 | [2] | -0.28 | [2] |
| 1958 | -0.52 | [2] | -0.01 | [2] | 0.01 | [2] | 0.92 | [2] | 0.17 | [2] | 0.58 | [2] |
| 1959 | -0.38 | R-1.64 | -0.01 | -0.03 | 0.02 | R0.09 | 0.87 | R3.78 | 0.21 | R0.92 | 0.71 | R3.12 |
| 1960 | -0.35 | R-1.51 | -0.01 | -0.02 | 0.02 | R0.11 | 0.89 | R3.81 | 0.26 | R1.14 | 0.82 | R3.51 |
| 1961 | -0.34 | R-1.44 | -0.01 | -0.03 | 0.04 | R0.17 | 0.92 | R3.92 | 0.14 | R0.58 | 0.76 | R3.21 |
| 1962 | -0.38 | R-1.57 | -0.01 | -0.02 | 0.08 | R0.34 | 1.01 | R4.21 | 0.32 | R1.34 | 1.03 | R4.30 |
| 1963 | -0.47 | R-1.95 | -0.01 | R-0.03 | 0.09 | R0.39 | 1.02 | R4.22 | 0.31 | R1.28 | 0.95 | R3.91 |
| 1964 | -0.46 | R-1.88 | -0.01 | R-0.04 | 0.10 | R0.39 | 1.08 | R4.39 | 0.35 | R1.44 | 1.06 | R4.31 |
| 1965 | -0.48 | R-1.90 | -0.01 | R-0.06 | 0.10 | R0.39 | 1.11 | R4.46 | 0.48 | R1.94 | 1.21 | R4.83 |
| 1966 | -0.47 | R-1.81 | -0.02 | R-0.08 | 0.09 | R0.34 | 1.11 | R4.30 | 0.53 | R2.07 | 1.24 | R4.81 |
| 1967 | -0.48 | R-1.81 | -0.01 | R-0.06 | 0.10 | R0.37 | 0.97 | R3.67 | 0.54 | R2.03 | 1.11 | R4.19 |
| 1968 | -0.50 | R-1.81 | -0.02 | R-0.06 | 0.11 | R0.39 | 1.17 | R4.23 | 0.68 | R2.47 | 1.45 | R5.22 |
| 1969 | -0.59 | R-2.04 | -0.04 | R-0.12 | 0.17 | R0.58 | 1.29 | R4.46 | 0.78 | R2.68 | 1.61 | R5.55 |
| 1970 | -0.96 | R-3.14 | -0.08 | R-0.25 | 0.23 | R0.74 | 1.24 | R4.06 | 0.98 | R3.21 | 1.41 | R4.62 |
| 1971 | -0.90 | R-2.79 | -0.04 | R-0.12 | 0.27 | R0.85 | 1.68 | R5.22 | 1.15 | R3.58 | 2.17 | R6.74 |
| 1972 | -0.98 | R-2.94 | -0.03 | R-0.08 | 0.28 | R0.82 | 2.37 | R7.07 | 1.50 | R4.48 | 3.13 | R9.35 |
| 1973 | -1.01 | R-2.86 | 0.01 | R0.02 | 0.32 | R0.91 | 4.24 | R11.97 | 2.93 | R8.26 | 6.48 | R18.30 |
| 1974 | -2.38 | R-6.18 | 0.15 | R0.39 | 0.48 | R1.24 | 15.24 | R39.58 | 10.14 | R26.34 | 23.63 | R61.37 |
| 1975 | -3.24 | R-7.67 | 0.08 | R0.19 | 1.06 | R2.51 | 18.29 | R43.34 | 5.76 | R13.65 | 21.96 | R52.03 |
| 1976 | -2.89 | R-6.49 | 0.04 | R0.10 | 1.56 | R3.50 | 25.43 | R57.02 | 5.58 | R12.51 | 29.72 | R66.64 |
| 1977 | -2.62 | R-5.52 | 0.06 | R0.12 | 1.89 | R3.99 | 33.38 | R70.43 | 7.28 | R15.36 | 40.00 | R84.38 |
| 1978 | -1.98 | R-3.87 | 0.36 | R0.70 | 1.95 | R3.82 | 31.91 | R62.57 | 6.07 | R11.90 | 38.31 | R75.12 |
| 1979 | -3.35 | R-6.05 | 0.26 | R0.47 | 3.00 | R5.42 | 45.66 | R82.58 | 8.87 | R16.03 | 54.44 | R98.45 |
| 1980 | -4.60 | R-7.61 | -0.08 | R-0.13 | 3.98 | R6.60 | 61.15 | R101.24 | 10.42 | R17.25 | 70.88 | R117.35 |
| 1981 | -5.89 | R-8.93 | -0.03 | R-0.05 | 4.06 | R6.16 | 60.88 | R92.38 | 11.06 | R16.78 | 70.09 | R106.35 |
| 1982 | -5.97 | R-8.51 | -0.05 | R-0.07 | 4.39 | R6.27 | 45.25 | R64.56 | 8.00 | R11.41 | 51.63 | R73.65 |
| 1983 | -4.01 | R-5.49 | -0.04 | R-0.06 | 4.11 | R5.62 | 36.27 | R49.61 | 9.96 | R13.63 | 46.28 | R63.32 |
| 1984 | -4.09 | R-5.38 | -0.02 | R-0.03 | 3.17 | R4.18 | 36.26 | R47.77 | 13.25 | R17.46 | 48.57 | R63.99 |
| 1985 | -4.39 | R-5.61 | -0.03 | -0.04 | 2.79 | R3.55 | 32.68 | R41.68 | 12.57 | R16.03 | 43.60 | R55.62 |
| 1986 | -3.85 | R-4.78 | -0.04 | R-0.05 | 1.65 | R2.05 | 22.49 | R27.90 | 8.42 | R10.44 | 28.67 | R35.57 |
| 1987 | -3.35 | R-4.03 | 0.01 | 0.01 | 1.76 | R2.12 | 29.00 | R34.90 | 8.57 | R10.31 | 36.00 | R43.32 |
| 1988 | -3.95 | R-4.59 | 0.12 | R0.14 | 2.18 | R2.53 | 27.47 | R31.90 | 9.71 | R11.28 | 35.53 | R41.26 |
| 1989 | -4.19 | R-4.67 | 0.14 | R0.15 | 2.24 | R2.49 | 35.32 | R39.38 | 10.85 | R12.09 | 44.35 | R49.45 |
| 1990 | -4.42 | R-4.72 | 0.02 | 0.02 | 2.71 | R2.89 | 43.65 | R46.63 | 12.67 | R13.54 | 54.63 | R58.36 |
| 1991 | -4.51 | R-4.63 | 0.04 | 0.04 | 2.90 | R2.98 | 36.87 | R37.89 | 8.52 | R8.75 | 43.82 | R45.04 |
| 1992 | -4.11 | R-4.11 | 0.10 | R0.10 | 3.47 | R3.47 | 38.52 | R38.52 | 7.72 | R7.72 | 45.70 | R45.70 |
| 1993 | -2.87 | R-2.79 | 0.06 | 0.05 | R4.39 | R4.27 | 38.45 | R37.48 | 7.59 | R7.40 | R47.61 | R46.41 |
| 1994 | -2.62 | R-2.50 | 0.09 | R0.09 | R4.48 | R4.26 | R38.43 | R36.60 | R7.78 | R7.41 | R48.16 | R45.87 |
| 1995[P] | -3.32 | -3.09 | 0.11 | 0.10 | 3.51 | 3.26 | 42.80 | 39.81 | 6.41 | 5.96 | 49.50 | 46.05 |

[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

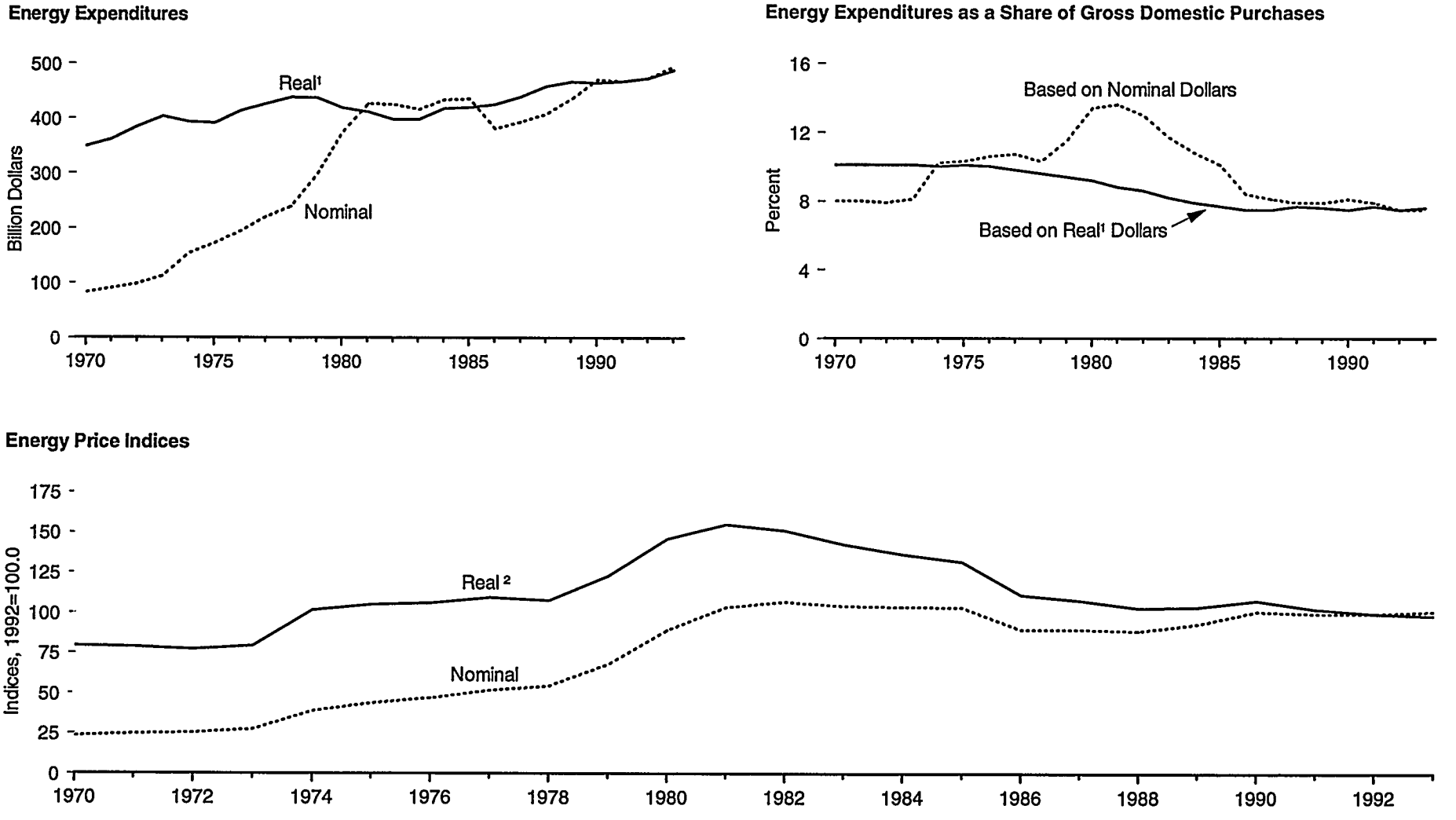
[2] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal values to real (inflation-adjusted) values, were not available in time to use in this report.

R=Revised data. P=Preliminary data. (s)=Less than $5 million.

Notes: • Net imports = imports minus exports. • Totals may not equal sum of components due to independent rounding. Data on this table may not equal data on Table 3.3 minus data on Table 3.4 due to independent rounding.

Sources: Tables 3.3 and 3.4.

## Figure 3.6 Energy Expenditures and Price Indices, 1970-1993




¹ In chained (1992) dollars.
² For explanation, see Table 3.6, footnote 4.

Source: Table 3.6.

# Table 3.6 Energy Expenditures and Price Indices, 1970-1993

| Year | Energy Expenditures | | Gross Domestic Purchases [1] | | Energy Expenditures as a Share of Gross Domestic Purchases [2] | | Gross Domestic Purchases Chained Price Index (1992=100.0) | Energy Expenditures Chained Price Indices [2,3] | |
|---|---|---|---|---|---|---|---|---|---|
| | Billion Dollars | Billion Chained (1992) Dollars [4] | Billion Dollars | Billion Chained (1992) Dollars | Based on Billion Dollars (Percent) | Based on Billion Chained (1992) Dollars (Percent) | | Nominal (1992 = 100.0) | Real (1992 = 100.0) |
| 1970 | 82.6 | R348.9 | R1,034.4 | R3,469.1 | R8.0 | R10.1 | 29.8 | R23.7 | R79.4 |
| 1971 | 89.8 | R361.8 | R1,128.4 | R3,592.5 | R8.0 | R10.1 | 31.4 | R24.8 | R79.0 |
| 1972 | 97.8 | R384.8 | R1,245.3 | R3,794.0 | R7.9 | R10.1 | 32.8 | R25.4 | R77.5 |
| 1973 | 111.6 | R403.2 | R1,382.0 | R3,975.2 | R8.1 | R10.1 | 34.8 | R27.7 | R79.6 |
| 1974 | 153.1 | R393.3 | R1,500.0 | R3,925.7 | R10.2 | R10.0 | 38.2 | R38.9 | R101.9 |
| 1975 | 171.8 | R391.3 | R1,667.1 | R3,867.2 | R10.3 | R10.1 | 41.8 | R43.9 | R105.0 |
| 1976 | R193.8 | R413.2 | R1,821.2 | R4,122.9 | R10.6 | R10.0 | 44.2 | R46.9 | R106.1 |
| 1977 | R220.4 | R426.2 | R2,050.5 | R4,351.5 | R10.7 | R9.8 | 47.2 | R51.7 | R109.6 |
| 1978 | R239.0 | R438.1 | R2,317.5 | R4,565.7 | R10.3 | R9.6 | 50.7 | R54.6 | R107.6 |
| 1979 | R297.2 | R437.5 | R2,581.5 | R4,668.2 | R11.5 | R9.4 | 55.3 | R67.9 | R122.8 |
| 1980 | 373.9 | R418.9 | R2,799.1 | R4,578.6 | R13.4 | R9.2 | 61.1 | R89.2 | R146.1 |
| 1981 | 426.4 | R411.7 | R3,130.9 | R4,697.3 | R13.6 | R8.8 | 66.8 | R103.6 | R155.1 |
| 1982 | 424.8 | R397.2 | R3,262.6 | R4,622.7 | R13.0 | R8.6 | 70.7 | R107.0 | R151.3 |
| 1983 | R415.7 | R397.8 | R3,566.2 | R4,870.7 | R11.7 | R8.2 | 73.2 | R104.5 | R142.8 |
| 1984 | 433.5 | R417.3 | R4,004.5 | R5,274.4 | R10.8 | R7.9 | 75.9 | R103.9 | R136.9 |
| 1985 | 435.4 | R420.0 | R4,294.9 | R5,488.8 | R10.1 | R7.7 | 78.4 | R103.7 | R132.2 |
| 1986 | R381.2 | R425.1 | R4,553.7 | R5,666.1 | R8.4 | R7.5 | 80.4 | R89.7 | R111.5 |
| 1987 | 393.5 | R438.9 | R4,834.5 | R5,815.7 | R8.1 | R7.5 | 83.1 | R89.7 | R107.9 |
| 1988 | 407.6 | R458.5 | R5,155.6 | R5,983.9 | R7.9 | R7.7 | 86.1 | R88.9 | R103.3 |
| 1989 | R434.8 | R465.9 | R5,519.1 | R6,146.1 | R7.9 | R7.6 | 89.8 | R93.3 | R103.9 |
| 1990 | R469.8 | R464.8 | R5,815.1 | R6,202.1 | R8.1 | R7.5 | 93.8 | R101.1 | R107.8 |
| 1991 | R467.4 | R467.3 | R5,937.2 | R6,101.1 | R7.9 | R7.7 | 97.3 | R100.0 | R102.8 |
| 1992 | R472.7 | R472.7 | R6,274.0 | R6,274.0 | R7.5 | R7.5 | 100.0 | R100.0 | R100.0 |
| 1993 | 493.3 | 487.6 | 6,615.2 | 6,457.3 | 7.5 | 7.6 | 102.5 | 101.2 | 98.7 |

[1] Represents all purchases of goods and services in the U.S. domestic economy. The data are not the same as the gross domestic product implicit price deflators (GDP) due to differences in coverage of imports and exports. The GDP represents the value of all goods and services produced in the United States, including exports and excluding imports. Gross domestic purchases represents the value of all goods and services consumed in the United States, including imports and excluding exports. Thus, the value of goods and services produced in the United States and consumed abroad is reflected in the GDP but not in gross domestic purchases, and the value of goods and services produced abroad and consumed in the United States is reflected in gross domestic purchases but not in the GDP.

[2] Calculations based on unrounded data.

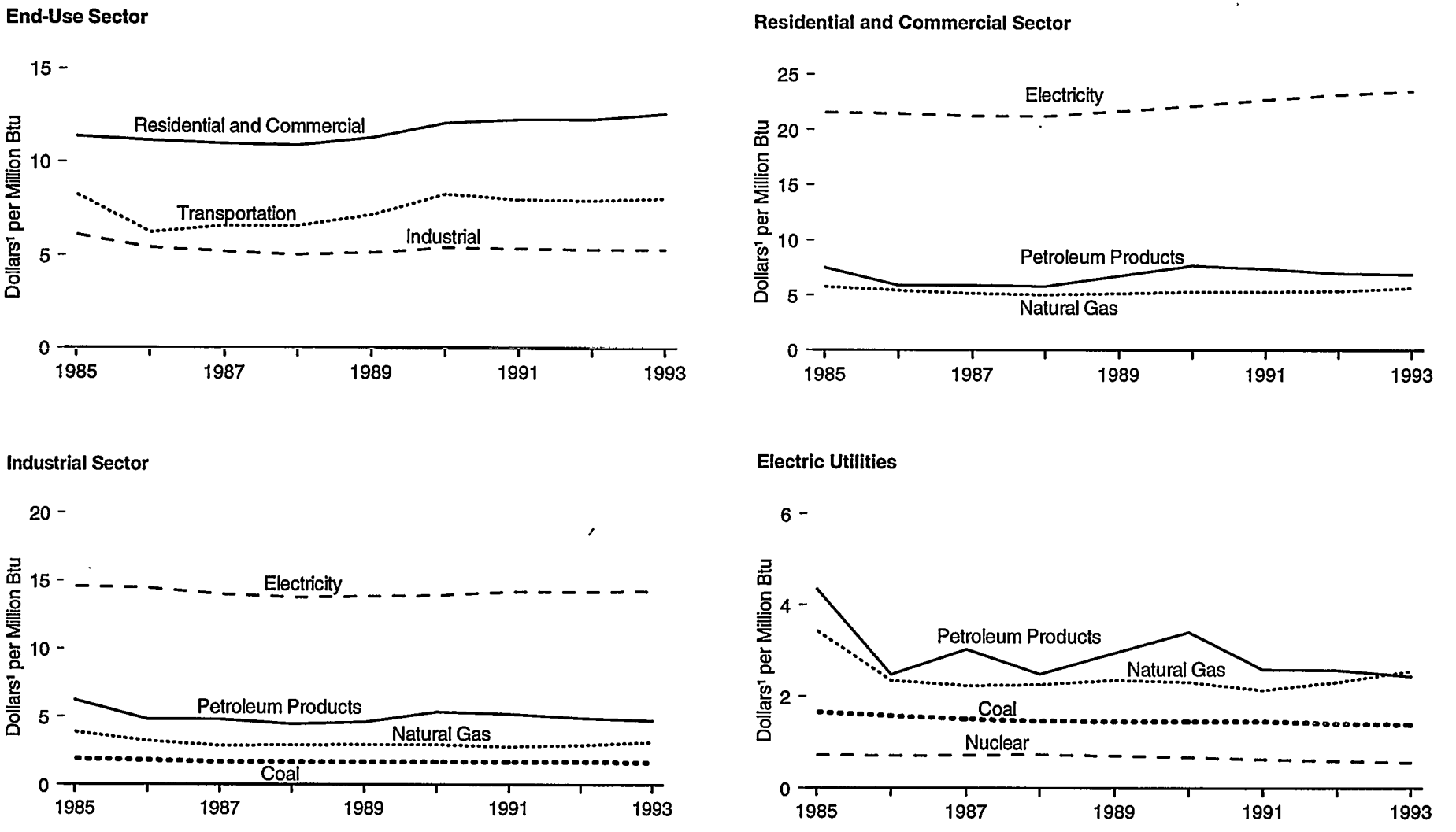
[3] The nominal chained energy index is based on the same methodology as used for the chained energy expenditure index (explained in footnote 4 below) except that the weights are quantities, i.e., British Thermal Units, rather than prices. The real chained energy price index is derived by dividing the nominal chained energy price index by the Gross Domestic Purchases chained price index.

[4] The methodology used to derive energy expenditures in chained (1992) dollars follows the methodology used by the U.S. Department of Commerce, Bureau of Economic Analysis, in the derivation of the measures of Gross Domestic Product and Gross Domestic Purchases in chained (1992) dollars. See the Bureau of Economic Analysis, *Survey of Current Business*, July 1995, pp. 32 and 33.

R=Revised data.

Sources: **Energy Expenditures:** Based on end-user prices and net energy consumption estimates from the Energy Information Administration (EIA), State Energy Price and Expenditure Data System 1993. **Gross Domestic Purchases:** *Economic Report of the President*, February 1996, Appendix B Statistical Tables: • Billion Dollars—Table B-1, p. 281. • Billion Chained (1992) Dollars—Table B-2, p. 283. • Chained Price Index—Table B-3, p. 285. (Original Source for Gross Domestic Purchases and Gross Domestic Purchases Chained Price Index: U.S. Department of Commerce, Bureau of Economic Analysis.)

## Figure 3.7 Energy Price Estimates by Sector, 1985-1993




[1] Nominal dollars.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 3.7.

# Table 3.7 Energy Price Estimates by Sector, 1970, 1975, 1980, and 1985-1993

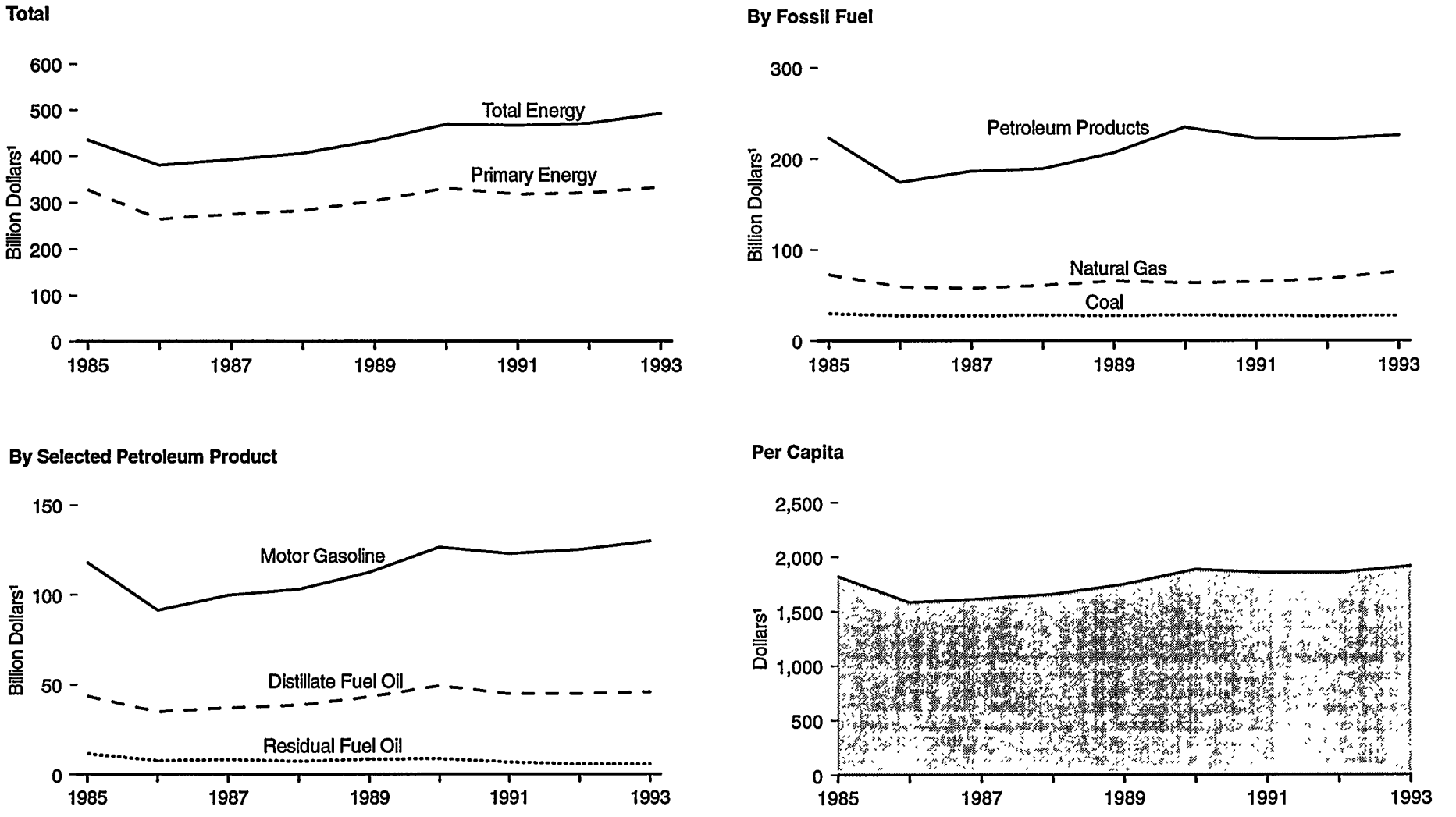
(Dollars[1] per Million Btu)

| Sector | 1970 | 1975 | 1980 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Residential and Commercial Sector** | **2.07** | **3.93** | **7.68** | **11.37** | **11.14** | **10.99** | **10.90** | **11.31** | **12.09** | **12.29** | **12.29** | **12.58** |
| Primary Energy | 1.08 | 1.97 | 4.36 | 6.12 | 5.49 | 5.27 | 5.17 | 5.49 | 5.78 | 5.71 | 5.66 | 5.85 |
| Coal | 0.73 | 1.78 | 2.10 | 2.37 | 2.23 | 2.03 | 1.97 | 1.99 | 2.17 | R2.16 | R2.16 | 2.27 |
| Natural Gas | 0.96 | 1.56 | 3.50 | 5.73 | 5.42 | 5.12 | 5.03 | 5.16 | 5.28 | 5.30 | 5.36 | 5.63 |
| Petroleum Products[2] | 1.32 | 2.82 | 6.58 | 7.47 | 5.89 | 5.87 | 5.79 | 6.72 | 7.67 | 7.40 | 6.97 | 6.88 |
| Distillate Fuel Oil | 1.32 | 2.66 | 6.86 | 7.32 | 5.70 | 5.49 | 5.49 | 6.20 | 7.30 | 6.90 | 6.38 | 6.25 |
| Liquefied Petroleum Gases | 1.98 | 3.81 | 7.50 | 9.02 | 8.51 | 8.49 | 8.35 | 9.92 | 10.59 | 10.65 | 10.09 | 10.04 |
| Motor Gasoline | 2.86 | 4.66 | 9.77 | 9.01 | 6.77 | 7.22 | 7.33 | 8.03 | 9.15 | 8.98 | 9.07 | 9.38 |
| Residual Fuel Oil | 0.45 | 1.91 | 4.12 | 4.50 | 2.70 | 3.10 | 2.52 | 2.92 | 3.41 | 2.61 | 2.68 | 2.75 |
| Electricity | 6.33 | 10.21 | 15.86 | 21.50 | 21.45 | 21.18 | 21.19 | 21.64 | 22.12 | 22.70 | 23.15 | 23.46 |
| **Industrial Sector** | **0.83** | **2.20** | **4.71** | **6.09** | **5.40** | **5.19** | **5.03** | R5.12 | **5.40** | R5.35 | R5.30 | **5.30** |
| Primary Energy[3] | 0.60 | 1.66 | 3.77 | 4.49 | 3.65 | 3.50 | 3.34 | R3.38 | R3.70 | R3.57 | R3.53 | 3.55 |
| Coal | 0.45 | 1.50 | 1.87 | 1.89 | 1.80 | 1.68 | 1.68 | 1.68 | 1.69 | 1.69 | 1.69 | 1.66 |
| Coking Coal | 0.45 | 1.65 | 2.10 | 2.03 | 1.90 | 1.74 | 1.79 | 1.78 | 1.79 | 1.83 | 1.83 | 1.79 |
| Steam Coal | 0.44 | 1.28 | 1.56 | 1.81 | 1.75 | 1.64 | 1.61 | 1.61 | 1.63 | 1.62 | 1.62 | 1.59 |
| Natural Gas | 0.38 | 0.95 | 2.52 | 3.87 | 3.20 | 2.88 | 2.90 | 2.93 | 2.95 | 2.80 | 2.91 | 3.15 |
| Petroleum Products[4] | 0.96 | 2.41 | 5.59 | 6.20 | 4.80 | 4.80 | 4.48 | R4.62 | R5.37 | R5.20 | R4.90 | 4.73 |
| Asphalt and Road Oil | 0.68 | 1.89 | 3.68 | 4.77 | 4.34 | 3.56 | 3.39 | 2.95 | 3.02 | 3.14 | 2.50 | 2.90 |
| Distillate Fuel Oil | 0.72 | 2.23 | 5.54 | 6.10 | 3.76 | 4.16 | 3.83 | 4.78 | 5.68 | 5.14 | R4.91 | 4.78 |
| Liquefied Petroleum Gases | 1.10 | 2.51 | 5.18 | 5.66 | 5.63 | 5.16 | 4.97 | 4.06 | 5.37 | 5.42 | R4.91 | 4.74 |
| Lubricants | 5.08 | 7.48 | 14.36 | 17.61 | 15.59 | 12.70 | 14.61 | R14.48 | R14.60 | R16.79 | R19.43 | 18.94 |
| Residual Fuel Oil | 0.46 | 1.91 | 3.69 | 4.24 | 2.51 | 2.87 | 2.34 | 2.75 | 3.10 | 2.44 | 2.46 | 2.41 |
| Electricity | 2.99 | 6.07 | 10.81 | 14.57 | 14.45 | 13.98 | 13.78 | 13.85 | 13.92 | 14.18 | 14.18 | 14.22 |
| **Transportation Sector** | **2.31** | **4.02** | **8.61** | **8.26** | **6.22** | **6.57** | **6.56** | R7.17 | R8.27 | R7.98 | R7.92 | **8.03** |
| Primary Energy | 2.31 | 4.02 | 8.60 | 8.25 | 6.21 | 6.56 | 6.55 | R7.16 | R8.26 | R7.97 | R7.91 | 8.02 |
| Coal | 0.41 | 1.26 | (5) | (5) | (5) | (5) | (5) | (5) | (5) | (5) | (5) | (5) |
| Petroleum Products[6] | 2.31 | 4.02 | 8.60 | 8.25 | 6.21 | 6.56 | 6.55 | R7.16 | R8.26 | R7.97 | R7.91 | 8.02 |
| Distillate Fuel Oil | 1.31 | 2.80 | 7.19 | 7.50 | 6.36 | 6.75 | 6.59 | 7.16 | 8.46 | 8.11 | 8.01 | 8.05 |
| Jet Fuel | 0.73 | 2.05 | 6.36 | 5.91 | 3.92 | 4.03 | 3.80 | 4.39 | 5.68 | 4.83 | 4.52 | 4.29 |
| Motor Gasoline | 2.85 | 4.64 | 9.84 | 9.01 | 6.79 | 7.22 | 7.32 | 8.01 | 9.12 | 8.93 | 8.96 | 9.07 |
| Residual Fuel Oil | 0.38 | 1.72 | 3.31 | 4.36 | 2.11 | 2.64 | 2.22 | 2.47 | 2.98 | 2.83 | R1.98 | 1.98 |
| Electricity | 4.65 | 11.72 | 14.71 | 19.74 | 19.63 | 23.03 | 22.05 | 22.99 | 23.49 | 23.79 | R25.23 | 26.03 |
| **Electric Utilities** | **0.32** | **0.96** | **1.75** | **1.85** | **1.55** | **1.51** | **1.45** | **1.48** | **1.46** | **1.37** | **1.34** | **1.35** |
| Coal | 0.31 | 0.82 | 1.35 | 1.65 | 1.58 | 1.51 | 1.47 | 1.45 | 1.45 | 1.45 | 1.41 | 1.39 |
| Natural Gas | 0.28 | 0.75 | 2.20 | 3.43 | 2.35 | 2.24 | 2.26 | 2.36 | 2.32 | 2.14 | 2.32 | 2.56 |
| Petroleum Products[7] | 0.42 | 2.00 | 4.34 | 4.35 | 2.48 | 3.04 | 2.49 | 2.95 | 3.41 | 2.59 | 2.58 | 2.45 |
| Heavy Oil[8] | 0.41 | 1.99 | 4.25 | 4.24 | 2.42 | 2.97 | 2.41 | 2.85 | 3.30 | 2.46 | 2.48 | 2.37 |
| Nuclear Fuel | 0.18 | 0.24 | 0.43 | 0.71 | 0.70 | 0.71 | 0.73 | 0.70 | 0.67 | 0.63 | 0.59 | 0.56 |
| Biomass Fuels | 0.65 | 0.92 | 1.74 | 0.79 | 0.32 | 0.95 | 0.87 | 0.69 | 0.52 | 0.55 | R0.55 | 0.53 |

[1] Nominal dollars.
[2] In addition to listed products, includes kerosene.
[3] In addition to listed energy sources, includes imports and exports of coal coke.
[4] In addition to listed products, includes kerosene, motor gasoline, still gas, special naphthas, petrochemical feedstocks, petroleum coke, wax, pentanes plus, and miscellaneous products.
[5] Not applicable.
[6] In addition to listed products, includes aviation gasoline, liquefied petroleum gases, and lubricants.
[7] In addition to listed products, includes fuel oil nos. 1 and 2, kerosene, jet fuel, and petroleum coke.
[8] Heavy oil includes fuel oil nos. 4, 5, and 6, and residual fuel oils.
R=Revised data.

Sources: **Residential and Commercial Sector:** Developed from the Energy Information Administration (EIA) State Energy Price and Expenditure Data System (SEPEDS) 1993, which contains data for 1970-1993, for the individual sectors. **All Other Sectors:** EIA, SEPEDS 1993, as published for selected years in the *State Energy Price and Expenditure Report 1993* (December 1995), p. 18. Data also available by State in the report and data system.

## Figure 3.8 Energy Expenditure Estimates, 1985-1993




[1] Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 3.8.

# Table 3.8 Energy Expenditure Estimates, 1970, 1975, 1980, and 1985-1993

(Billion Dollars[1], Except as Noted)

| Energy Source | 1970 | 1975 | 1980 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Coal** | 4.6 | 13.0 | 22.6 | 29.7 | 27.9 | 27.6 | 28.4 | 28.1 | 28.4 | 27.9 | 27.4 | 27.9 |
| Coking Coal | 1.2 | 3.7 | 3.8 | 2.2 | 1.8 | 1.7 | 2.0 | 1.9 | 1.9 | 1.7 | 1.6 | 1.5 |
| Steam Coal | 3.4 | 9.4 | 18.9 | 27.5 | 26.1 | 25.9 | 26.4 | 26.2 | 26.5 | 26.2 | 25.8 | 26.4 |
| **Natural Gas** | 10.9 | 20.1 | 51.1 | 72.9 | 59.7 | 58.0 | 61.1 | 65.4 | 64.1 | 64.7 | 68.4 | 76.0 |
| **Petroleum Products** | 48.1 | 103.9 | 238.4 | 223.2 | 174.5 | 186.4 | 189.3 | R206.7 | R234.8 | R222.3 | R221.7 | 225.8 |
| Asphalt and Road Oil | 0.7 | 1.9 | 3.5 | 4.9 | 4.7 | 4.0 | 3.8 | 3.2 | 3.5 | 3.4 | 2.8 | 3.3 |
| Aviation Gasoline | 0.2 | 0.2 | 0.6 | 0.5 | 0.5 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 |
| Distillate Fuel Oil | 6.3 | 15.7 | 40.8 | 43.6 | 35.0 | 37.3 | 38.4 | 43.3 | 49.3 | 45.1 | 44.9 | 45.7 |
| Jet Fuel | 1.4 | 4.2 | 13.9 | 14.7 | 10.5 | 11.4 | 11.3 | 13.4 | 17.8 | 14.6 | 13.6 | 13.0 |
| Kerosene | 0.6 | 0.9 | 2.3 | 1.9 | 1.3 | 1.2 | 1.2 | 1.2 | 0.7 | 0.8 | 0.6 | 0.7 |
| Liquefied Petroleum Gases | 2.4 | 5.2 | 10.9 | 13.1 | 12.3 | 12.4 | 12.3 | 11.8 | 13.2 | 14.4 | 13.6 | 13.2 |
| Lubricants | 1.5 | 2.3 | 5.1 | 5.7 | 4.9 | 4.5 | 5.0 | R5.1 | R5.3 | R5.4 | R6.4 | 6.4 |
| Motor Gasoline | 31.6 | 59.4 | 124.4 | 118.0 | 91.5 | 99.8 | 103.2 | 112.6 | 126.5 | 123.1 | 125.2 | 130.0 |
| Residual Fuel Oil | 2.0 | 10.4 | 21.6 | 11.5 | 7.5 | 8.1 | 7.3 | 8.4 | 8.7 | 6.8 | R5.6 | 5.5 |
| Other Petroleum Products[2] | 1.2 | 3.6 | 15.3 | 9.2 | 6.3 | 7.3 | 6.4 | 7.3 | R9.4 | R8.4 | R8.7 | 7.7 |
| **Nuclear Fuel** | (s) | 0.4 | 1.2 | 2.9 | 3.1 | 3.5 | 4.1 | 4.0 | 4.1 | 4.2 | 3.9 | 3.7 |
| **Biomass Fuels at Utilities** | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) |
| **Imports of Coal Coke** | (s) | 0.2 | 0.1 | (s) | (s) | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| **Exports of Coal Coke[3]** | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | (s) | -0.1 | -0.1 | -0.1 | -0.1 | (s) | -0.1 |
| **Total Primary Energy[4]** | 63.5 | 137.5 | 313.2 | 328.8 | 265.2 | 275.5 | 283.0 | R304.3 | R331.5 | R319.1 | R321.5 | 333.4 |
| Electric Utility Fuel[3,5] | -4.3 | -16.4 | -37.4 | -42.6 | -35.8 | -36.7 | -37.4 | -38.9 | -38.4 | -36.5 | -35.8 | -36.7 |
| Electricity Purchased by End Users[6] | 23.4 | 50.7 | 98.1 | 149.2 | 151.8 | 154.7 | 162.1 | 169.3 | 176.7 | 184.8 | 187.0 | 196.6 |
| **Total Energy** | 82.6 | 171.8 | 373.9 | 435.4 | R381.2 | 393.5 | 407.6 | R434.8 | R469.8 | R467.4 | R472.7 | 493.3 |
| **Total Energy per Capita (Dollars[1])** | 406 | 797 | 1,650 | 1,824 | 1,581 | 1,617 | 1,658 | R1,751 | R1,889 | R1,854 | R1,854 | 1,914 |

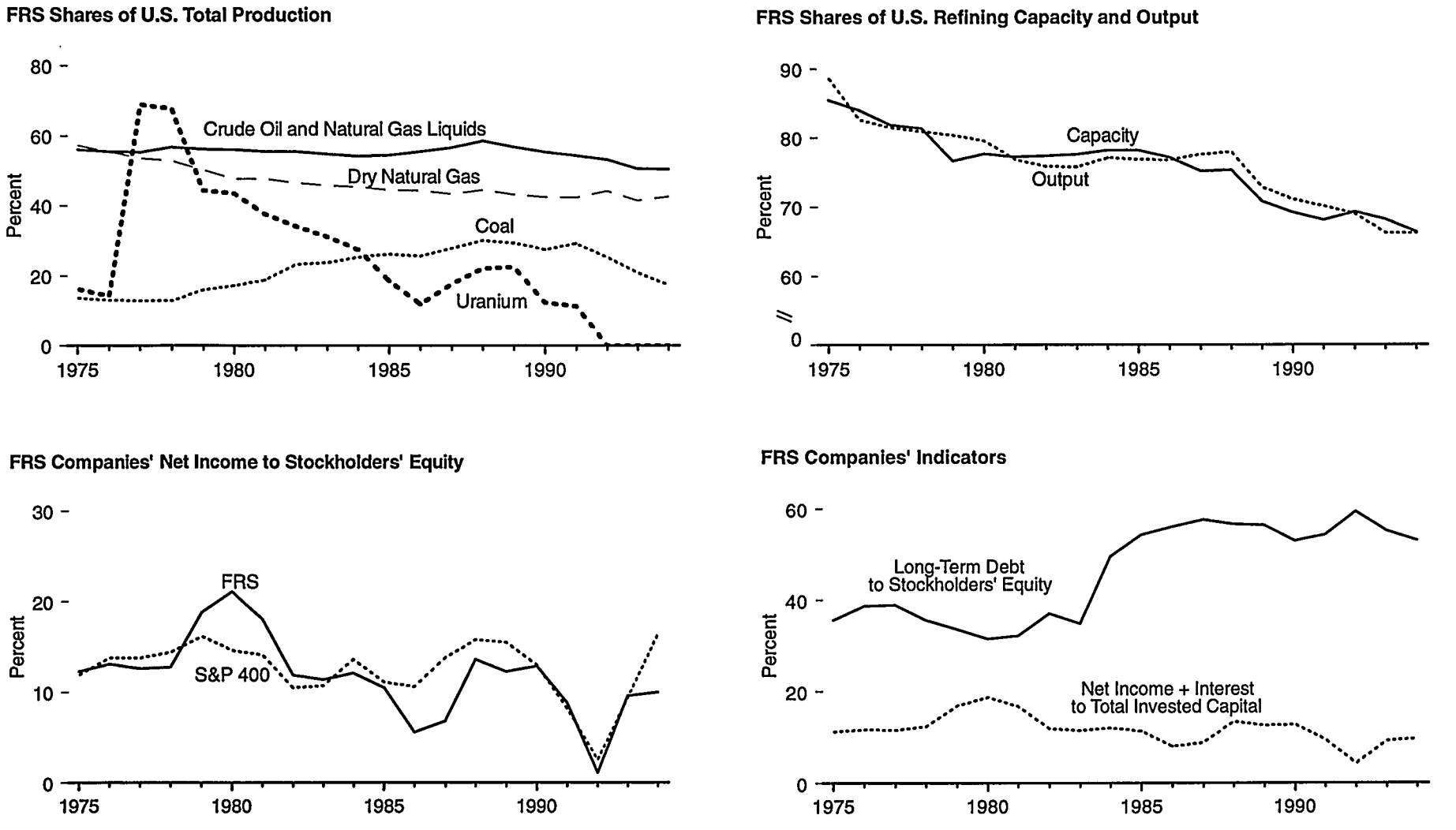
[1] Nominal dollars.
[2] Pentanes plus, petrochemical feedstocks, special naphthas, petroleum coke, still gas, wax, and miscellaneous products.
[3] In determining total energy expenditures, this is a negative quantity.
[4] Biomass fuels are not included, except those consumed at electric utilities and those added to motor gasoline.
[5] There are no direct fuel costs for hydroelectric, geothermal, centralized solar, or wind energy.
[6] These are sales. In determining total energy expenditures, this is a positive quantity.

R=Revised data. (s)=Less than $0.05 billion.

Note: Totals may not equal sum of components due to independent rounding.

Sources: **Expenditures:** Energy Information Administration (EIA), State Energy Price and Expenditure Data System (SEPEDS) 1993. which contains data for 1970-1993, as published for selected years in the *State Energy Price and Expenditure Report (SEPER) 1993* (December 1995), p. 17. Data also available by State in the report and data system. **Total Energy per Capita:** EIA, SEPEDS 1993, as published by State for 1993 in *SEPER 1993,* (December 1995), p. 8.

# Figure 3.9 FRS Companies' Operations, Selected Statistics, 1975-1994




Notes: • FRS is the Financial Reporting System (see Table 3.14).
• Because vertical scales differ, graphs should not be compared.

Source: Table 3.9.

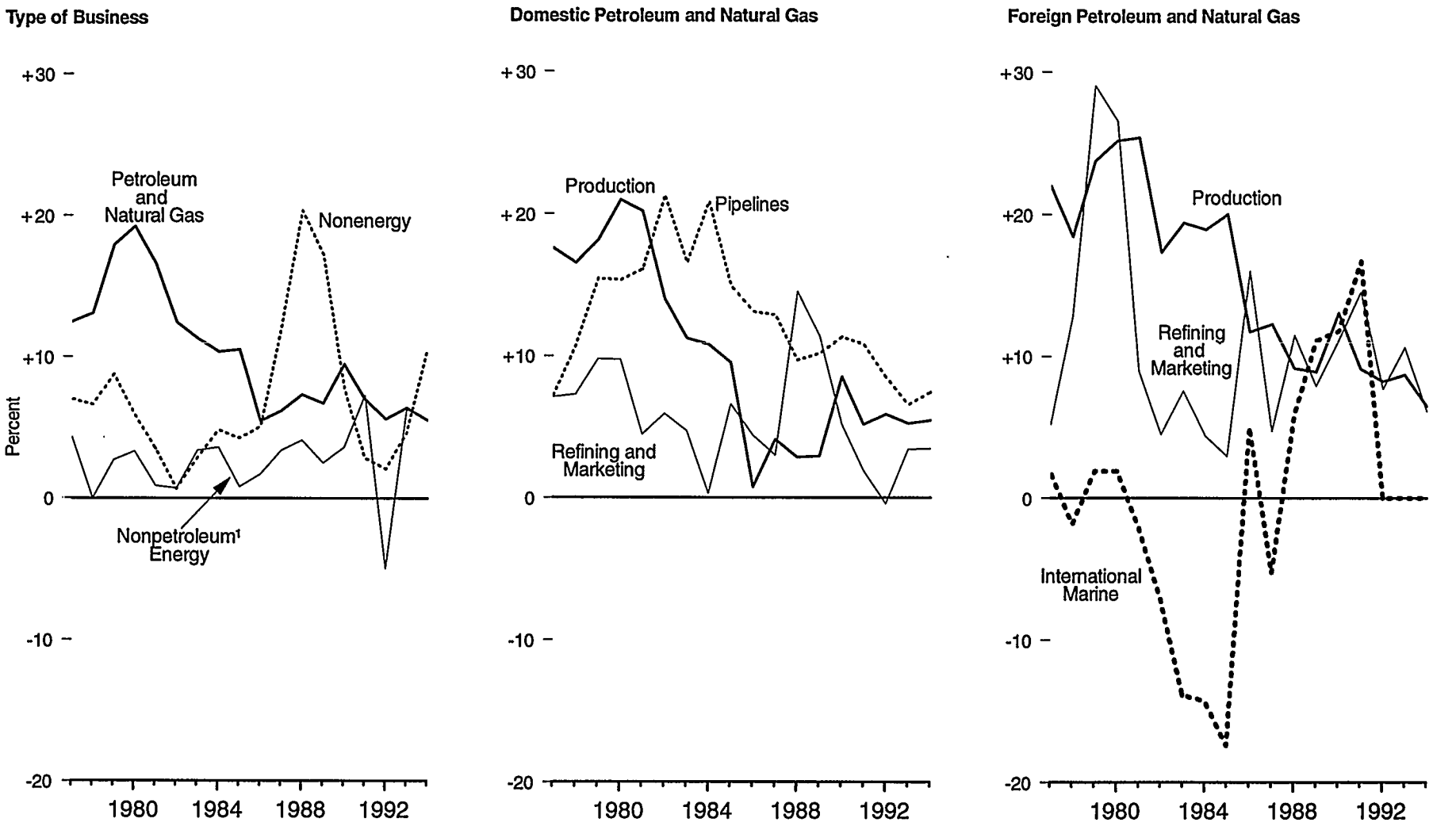
# Table 3.9 FRS Companies' Operations, Selected Statistics, 1975-1994

| | Production | | | | Refining | | Financial Indicators | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Crude Oil and Natural Gas Liquids | Dry Natural Gas | Coal [1] | Uranium | Capacity [2,3] | Output [3] | Net Income | Net Income to Stockholders' Equity | Net Income to Stockholders' Equity for S & P 400 [4] | Net Income Plus Interest to Total Invested Capital | Long-Term Debt to Stockholders' Equity |
| | Million Barrels | Trillion Cubic Feet | Million Short Tons | Million Pounds $U_3O_8$ | Million Barrels per Day | | Billion Dollars [5] | Percent | | | |
| 1975 | 2,049.9 | 11.0 | 88.1 | 4.3 | 13.4 | 12.8 | 10.3 | 12.3 | 11.9 | 11.3 | 35.6 |
| 1976 | 1,983.4 | 10.6 | 89.0 | 3.3 | 14.2 | 12.8 | 12.0 | 13.1 | 13.8 | 11.7 | 38.7 |
| 1977 | 1,991.2 | 10.3 | 89.1 | 16.0 | 14.6 | 13.6 | 12.7 | 12.6 | 13.8 | 11.6 | 38.9 |
| 1978 | 2,131.4 | 10.1 | 85.5 | 17.3 | 14.8 | 13.6 | 13.9 | 12.8 | 14.4 | 12.3 | 35.6 |
| 1979 | 2,081.7 | 9.9 | 123.3 | 16.7 | 14.4 | 13.3 | 23.5 | 18.8 | 16.1 | 16.9 | 33.7 |
| 1980 | 2,087.5 | 9.3 | 142.3 | 19.0 | 15.1 | 12.2 | 31.0 | 21.1 | 14.6 | 18.7 | 31.5 |
| 1981 | 2,072.4 | 9.2 | 154.8 | 14.5 | 14.6 | 11.8 | 30.0 | 18.1 | 14.1 | 16.8 | 32.2 |
| 1982 | 2,079.1 | 8.3 | 195.2 | 9.2 | 13.6 | 10.6 | 21.8 | 11.9 | 10.5 | 11.9 | 37.1 |
| 1983 | 2,059.3 | 7.4 | 185.2 | 6.6 | 13.0 | 10.4 | 21.9 | 11.4 | 10.7 | 11.5 | 34.8 |
| 1984 | 2,088.8 | 7.9 | 226.0 | 4.1 | 12.8 | 11.0 | 21.3 | 12.1 | 13.6 | 12.0 | 49.5 |
| 1985 | 2,120.5 | 7.3 | 230.4 | 2.1 | 12.6 | 10.9 | 17.4 | 10.5 | 11.1 | 11.4 | 54.3 |
| 1986 | 2,089.6 | 7.1 | 227.6 | 1.6 | 12.5 | 11.5 | 9.2 | 5.6 | 10.6 | 8.1 | 56.0 |
| 1987 | 2,069.5 | 7.2 | 255.3 | 2.3 | 12.5 | 11.7 | 11.3 | 6.8 | 13.8 | 8.8 | 57.6 |
| 1988 | 2,102.1 | 7.6 | 285.3 | 2.9 | 12.3 | 12.0 | 22.3 | 13.6 | 15.8 | 13.4 | 56.6 |
| 1989 | 1,911.1 | 7.5 | 286.9 | 3.1 | 11.5 | 11.4 | 19.8 | 12.3 | 15.5 | 12.5 | 56.4 |
| 1990 | 1,814.0 | 7.6 | 282.0 | 1.1 | 11.4 | 11.3 | 21.6 | 12.9 | 13.0 | 12.8 | 53.0 |
| 1991 | 1,818.1 | 7.5 | 289.6 | 0.9 | 11.2 | 11.1 | 14.7 | 8.8 | 8.2 | 9.5 | 54.3 |
| 1992 | 1,750.2 | 7.9 | 251.9 | 0.0 | 11.0 | 11.0 | 1.8 | 1.1 | 2.5 | 4.3 | 59.4 |
| 1993 | 1,632.5 | 7.7 | 197.3 | 0.0 | 10.7 | 10.8 | 15.5 | 9.6 | R 9.4 | 9.3 | 55.2 |
| 1994 | 1,593.8 | 8.0 | 179.7 | 0.0 | 10.7 | 10.8 | 16.5 | 10.0 | 16.4 | 9.7 | 53.1 |
| | Percent of U.S. Total | | | | | | | | | | |
| 1975 | 56.1 | 57.3 | 13.6 | 16.2 | R85.5 | R88.7 | | | | | |
| 1976 | 55.6 | 55.5 | 13.1 | 14.3 | R84.0 | R82.6 | | | | | |
| 1977 | 55.3 | 53.6 | 12.9 | 69.0 | R81.9 | R81.5 | | | | | |
| 1978 | 56.8 | 52.9 | 12.9 | 67.8 | R81.4 | R80.9 | | | | | |
| 1979 | 56.3 | 50.3 | 15.9 | 44.5 | R76.7 | R80.4 | | | | | |
| 1980 | 56.1 | R47.7 | 17.3 | 43.5 | R77.7 | R79.6 | | | | | |
| 1981 | R55.5 | R47.8 | 18.9 | 37.7 | R77.3 | R76.9 | | | | | |
| 1982 | R55.6 | 46.6 | 23.4 | 34.2 | R77.4 | R75.9 | | | | | |
| 1983 | R54.8 | R45.8 | 23.8 | 31.1 | R77.6 | R75.8 | | | | | |
| 1984 | R54.2 | R45.5 | 25.3 | 27.5 | R78.2 | R77.1 | | | | | |
| 1985 | R54.5 | R44.6 | 26.2 | 18.6 | R78.2 | R76.9 | | | | | |
| 1986 | R55.6 | R44.5 | 25.7 | 11.9 | R77.2 | R76.8 | | | | | |
| 1987 | R56.7 | 43.4 | 27.9 | 17.7 | R75.2 | R77.6 | | | | | |
| 1988 | R58.5 | R44.6 | 30.1 | 22.1 | R75.4 | R78.0 | | | | | |
| 1989 | R56.8 | R43.2 | 29.4 | 22.5 | R70.8 | R72.9 | | | | | |
| 1990 | R55.3 | R42.6 | 27.5 | 12.4 | R69.2 | R71.1 | | | | | |
| 1991 | R54.3 | R42.4 | 29.2 | 11.3 | R68.1 | R70.1 | | | | | |
| 1992 | R53.2 | R44.2 | 25.3 | 0.0 | R69.3 | 69.0 | | | | | |
| 1993 | R50.6 | R41.5 | R 20.9 | 0.0 | R68.2 | R66.2 | | | | | |
| 1994 | 50.5 | 42.7 | 17.4 | 0.0 | 66.4 | 66.2 | | | | | |

[1] Bituminous coal, subbituminous coal, and lignite.
[2] Operable capacity as of January 1 of the following year.
[3] Includes Puerto Rico and the Virgin Islands.
[4] Standard and Poors' 400.
[5] Nominal dollars.
R=Revised data.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • FRS Crude Oil and NGL and Natural Gas (Dry Marketed) production are on a net ownership interest basis (see Glossary).
Sources: **FRS Company Statistics:** Energy Information Administration (EIA), *Performance Profiles of Major Energy Producers* report series. **U.S. Production Data for Calculation of Shares:** EIA, *Annual Energy Review 1994*, Tables 5.1, 5.8, 5.9, 6.1, 7.2, and 9.3.

## Figure 3.10 FRS Companies' Return on Investment by Type of Business, 1977-1994




[1] Coal, nuclear, and other energy.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • Return on investment = net income as a percent of net investment in place.

Sources: Tables 3.10 and 3.11.

# Table 3.10 FRS Companies' Net Income, 1975-1994

(Billion Dollars[1])

| Year | Type of Business | | | | | Domestic Petroleum and Natural Gas | | | | Foreign Petroleum and Natural Gas | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Petroleum and Natural Gas | Coal | Nuclear and Other Energy | Non-energy | Total [2] | Production | Refining and Marketing | Rate Regulated Pipelines | Total [2] | Production | Refining and Marketing | International Marine | Total [2] |
| 1975 | NA | NA | NA | NA | 10.3 | NA | NA | NA | NA | NA | NA | NA | NA |
| 1976 | NA | NA | NA | NA | 12.0 | NA | NA | NA | NA | NA | NA | NA | NA |
| 1977 | 13.0 | 0.2 | (s) | 1.7 | 12.7 | 6.4 | 1.5 | 0.8 | 8.6 | 3.6 | 0.7 | 0.1 | 4.4 |
| 1978 | 14.7 | 0.1 | -0.1 | 1.8 | 13.9 | 6.7 | 1.6 | 1.2 | 9.5 | 3.5 | 1.8 | -0.1 | 5.2 |
| 1979 | 23.0 | 0.3 | -0.1 | 2.8 | 23.5 | 9.4 | 2.3 | 1.7 | 13.4 | 5.2 | 4.3 | 0.1 | 9.7 |
| 1980 | 29.1 | 0.3 | (s) | 2.3 | 31.0 | 13.8 | 2.5 | 1.7 | 17.9 | 6.9 | 4.3 | 0.1 | 11.2 |
| 1981 | 29.5 | 0.4 | -0.3 | 1.6 | 30.0 | 16.8 | 1.3 | 1.8 | 19.9 | 8.0 | 1.6 | -0.1 | 9.6 |
| 1982 | 25.0 | 0.4 | -0.3 | 0.4 | 21.8 | 14.1 | 1.9 | 2.3 | 18.3 | 6.1 | 0.8 | -0.3 | 6.7 |
| 1983 | 24.0 | 0.5 | (s) | 1.8 | 21.9 | 12.2 | 1.6 | 2.0 | 15.9 | 7.2 | 1.3 | -0.5 | 8.2 |
| 1984 | 23.6 | 0.6 | -0.1 | 2.9 | 21.3 | 13.3 | 0.1 | 2.5 | 15.8 | 7.5 | 0.7 | -0.4 | 7.8 |
| 1985 | 24.8 | 0.4 | -0.3 | 2.5 | 17.4 | 12.1 | 2.3 | 2.3 | 16.7 | 8.0 | 0.5 | -0.4 | 8.1 |
| 1986 | 12.9 | 0.2 | (s) | 2.8 | 9.2 | 0.9 | 1.6 | 2.6 | 5.2 | 4.7 | 2.9 | 0.1 | 7.7 |
| 1987 | 14.8 | 0.4 | (s) | 7.1 | 11.3 | 4.7 | 1.1 | 2.6 | 8.4 | 5.4 | 1.0 | -0.1 | 6.4 |
| 1988 | 17.5 | 0.6 | -0.1 | 10.8 | 22.3 | 3.2 | 5.4 | 2.0 | 10.6 | 4.3 | 2.4 | 0.1 | 6.9 |
| 1989 | 16.2 | 0.4 | -0.1 | 8.7 | 19.8 | 3.1 | 4.5 | 1.9 | 9.5 | 4.7 | 1.8 | 0.2 | 6.7 |
| 1990 | 23.4 | 0.3 | 0.1 | 4.3 | 21.6 | 8.7 | 2.2 | 2.1 | 12.9 | 7.4 | 2.8 | 0.2 | 10.5 |
| 1991 | 17.7 | 0.6 | 0.1 | 1.6 | 14.7 | 5.1 | 0.9 | 2.0 | 7.9 | 5.4 | 4.1 | 0.3 | 9.8 |
| 1992 | 14.4 | -0.5 | 0.1 | 1.2 | 1.8 | 5.6 | -0.2 | 2.1 | 7.5 | 4.7 | 2.2 | (s) | 6.9 |
| 1993 | 16.5 | 0.4 | 0.1 | 2.7 | 15.5 | 4.8 | 1.7 | 1.6 | 8.1 | 5.2 | 3.2 | (s) | 8.4 |
| 1994 | 14.4 | 0.2 | 0.2 | 6.2 | 16.5 | 4.8 | 1.8 | 1.8 | 8.5 | 4.0 | 2.0 | (s) | 5.9 |

[1] Nominal dollars.

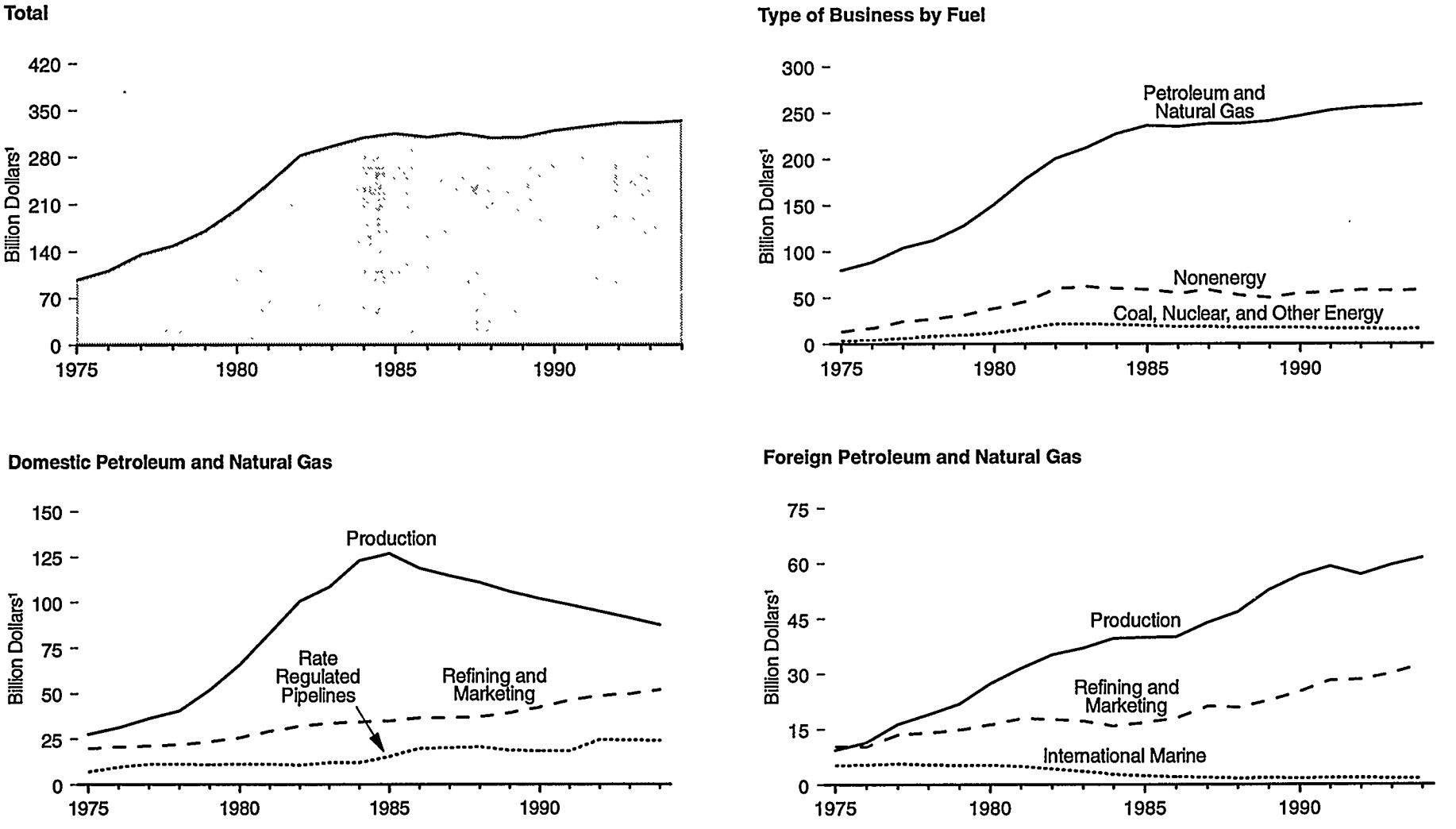
[2] Total is sum of components shown, plus eliminations and nontraceables, which are defined in the glossary.

NA=Not available. (s)=Less than $50 million in absolute value.

Note: FRS is the Financial Reporting System (see Table 3.14).

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

## Figure 3.11 FRS Companies' Net Investment in Place, 1975-1994




[1] Nominal dollars.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • Because vertical scales differ, graphs should not be compared.

Source: Table 3.11.

# Table 3.11 FRS Companies' Net Investment in Place, 1975-1994

(Billion Dollars[1])

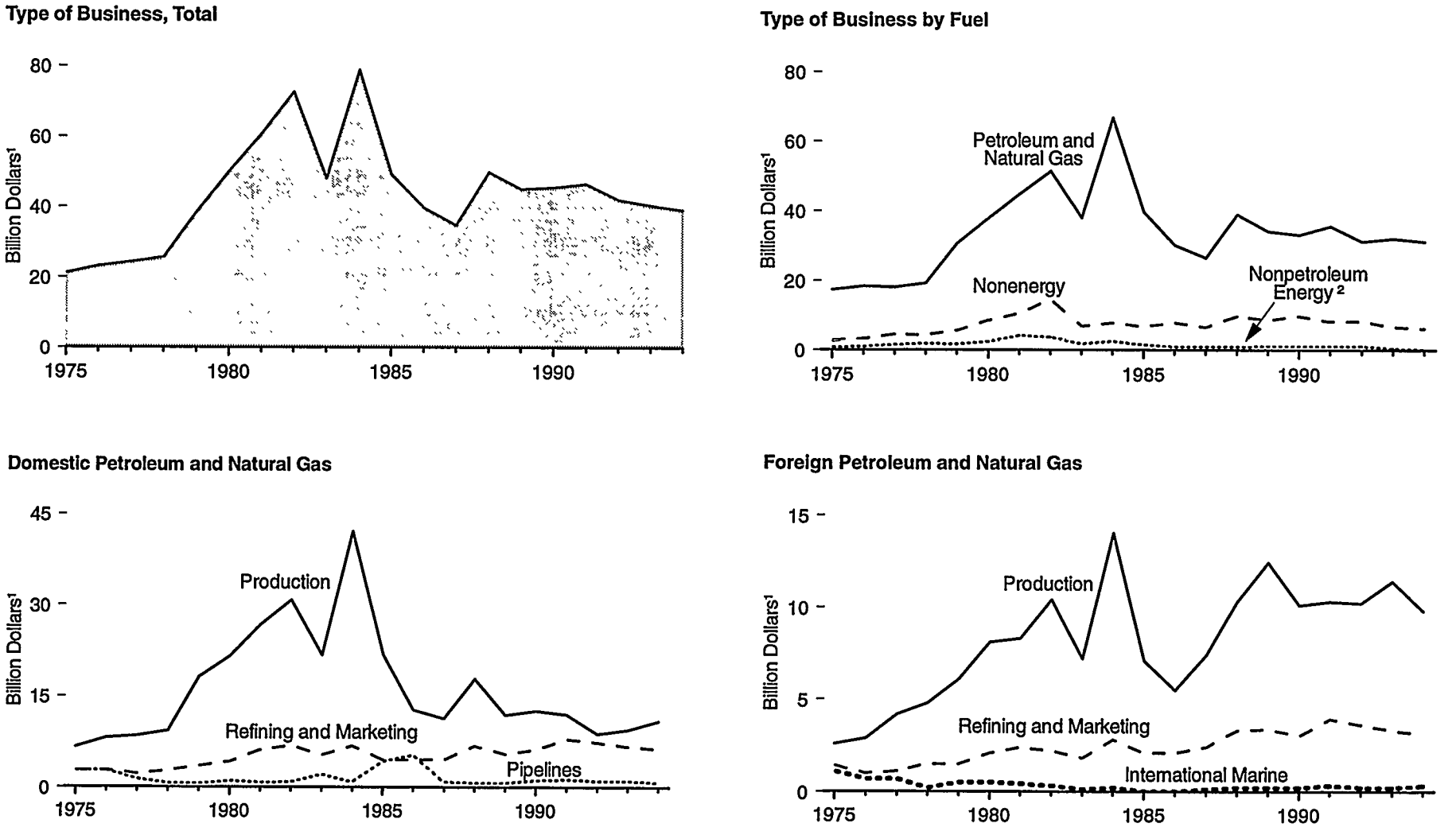
| Year | Type of Business | | | | | | Domestic Petroleum and Natural Gas | | | | Foreign Petroleum and Natural Gas | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Petroleum and Natural Gas | Coal | Nuclear and Other Energy | Non-energy | Non-traceables | Total | Production | Refining and Marketing | Rate Regulated Pipelines | Total | Production | Refining and Marketing | International Marine | Total |
| 1975 | 79.8 | 1.6 | 0.8 | 13.7 | 1.0 | 97.3 | 27.8 | 20.0 | 7.0 | 54.8 | 9.4 | 10.3 | 5.2 | 24.9 |
| 1976 | 88.9 | 2.0 | 1.0 | 17.6 | 1.1 | 111.1 | 31.4 | 20.7 | 9.5 | 61.7 | 11.4 | 10.3 | 5.4 | 27.1 |
| 1977 | 104.2 | 2.8 | 1.9 | 24.3 | 1.9 | 135.2 | 36.4 | 21.1 | 11.2 | 68.7 | 16.4 | 13.5 | 5.6 | 35.5 |
| 1978 | 112.2 | 3.3 | 3.1 | 27.3 | 2.1 | 148.1 | 40.5 | 22.0 | 11.2 | 73.7 | 19.0 | 14.1 | 5.4 | 38.5 |
| 1979 | 128.3 | 4.1 | 3.3 | 31.9 | 2.4 | 169.9 | 51.8 | 23.5 | 11.0 | 86.3 | 21.9 | 14.8 | 5.3 | 42.0 |
| 1980 | 151.4 | 5.0 | 4.0 | 38.7 | 3.4 | 202.6 | 65.8 | 25.7 | 11.1 | 102.5 | 27.4 | 16.2 | 5.3 | 48.9 |
| 1981 | 178.0 | 7.2 | 4.5 | 45.9 | 5.2 | 240.8 | 83.2 | 29.2 | 11.2 | 123.6 | 31.5 | 17.9 | 4.9 | 54.3 |
| 1982 | 200.7 | 9.3 | 5.3 | 60.3 | 6.9 | 282.5 | 100.7 | 32.1 | 10.8 | 143.6 | 35.2 | 17.8 | 4.2 | 57.2 |
| 1983 | 212.2 | 9.4 | 5.1 | 62.2 | 7.4 | 296.3 | 108.4 | 33.8 | 12.1 | 154.4 | 37.1 | 17.2 | 3.6 | 57.9 |
| 1984 | 227.8 | 9.2 | 4.7 | 60.3 | 7.4 | 309.4 | 123.1 | 34.3 | 12.0 | 169.4 | 39.6 | 15.9 | 2.8 | 58.4 |
| 1985 | 236.2 | 9.1 | 3.7 | 58.9 | 7.5 | 315.4 | 126.8 | 34.9 | 15.4 | 177.1 | 40.0 | 16.8 | 2.3 | 59.0 |
| 1986 | 235.4 | 8.4 | 3.3 | 55.4 | 7.4 | 309.9 | 118.9 | 36.5 | 19.8 | 175.1 | 40.1 | 18.1 | 2.0 | 60.3 |
| 1987 | 238.7 | 8.6 | 3.3 | 58.5 | 7.3 | 316.4 | 114.7 | 36.6 | 20.2 | 171.6 | 44.0 | 21.2 | 1.9 | 67.1 |
| 1988 | 238.4 | 8.7 | 3.4 | 53.1 | 6.0 | 309.6 | 111.1 | 37.1 | 20.6 | 168.8 | 46.9 | 20.9 | 1.7 | 69.6 |
| 1989 | 241.3 | 8.7 | 3.1 | 50.5 | 6.2 | 309.9 | 106.0 | 39.4 | 18.7 | 164.1 | 52.7 | 22.7 | 1.8 | 77.2 |
| 1990 | 246.7 | 8.2 | 3.0 | 55.1 | 6.5 | 319.6 | 102.1 | 42.5 | 18.5 | 163.1 | 56.7 | 25.2 | 1.7 | 83.6 |
| 1991 | 252.6 | 6.7 | 2.9 | 56.3 | 7.0 | 325.6 | 98.6 | 46.2 | 18.5 | 163.4 | 59.2 | 28.2 | 1.8 | 89.2 |
| 1992 | 256.0 | 5.2 | 2.8 | 58.7 | 8.7 | 331.5 | 95.1 | 48.8 | 24.7 | 168.6 | 57.0 | 28.5 | 1.8 | 87.4 |
| 1993 | 257.1 | 4.9 | 3.0 | 58.0 | 8.6 | 331.5 | 91.4 | 49.8 | 24.4 | 165.6 | 59.7 | 30.1 | 1.7 | 91.5 |
| 1994 | 259.4 | 4.1 | 3.1 | 58.5 | 9.5 | 334.6 | 87.6 | 51.8 | 24.1 | 163.6 | 61.5 | 32.6 | 1.7 | 95.8 |

[1] Nominal dollars.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • Net investment in place is net property, plant, and equipment, plus investments and advances. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

# Figure 3.12 FRS Companies' Additions to Investment in Place, 1975-1994




[1] Nominal dollars.
[2] Coal, nuclear, and other energy.
Notes: • FRS is the Financial Reporting System (see Table 3.14). • Because vertical scales differ, graphs should not be compared.
Source: Table 3.12.

# Table 3.12 FRS Companies' Additions to Investment in Place, 1975-1994

(Billion Dollars[1])

| Year | Type of Business | | | | | Domestic Petroleum and Natural Gas | | | | Foreign Petroleum and Natural Gas | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Petroleum and Natural Gas | Coal | Nuclear and Other Energy | Non-energy | Total [2] | Production | Refining and Marketing | Rate Regulated Pipelines | Total | Production | Refining and Marketing | International Marine | Total |
| 1975 | 17.3 | 0.5 | 0.3 | 2.7 | 21.1 | 6.6 | 2.8 | 2.8 | 12.2 | 2.6 | 1.4 | 1.1 | 5.1 |
| 1976 | 18.4 | 0.5 | 0.5 | 3.3 | 23.1 | 8.1 | 2.8 | 2.8 | 13.8 | 2.9 | 1.0 | 0.7 | 4.6 |
| 1977 | 18.1 | 0.9 | 0.6 | 4.5 | 24.3 | 8.5 | 2.2 | 1.4 | 12.1 | 4.2 | 1.1 | 0.7 | 6.0 |
| 1978 | 19.2 | 1.0 | 0.9 | 4.4 | 25.6 | 9.3 | 2.8 | 0.6 | 12.7 | 4.8 | 1.5 | 0.2 | 6.5 |
| 1979 | 30.7 | 0.8 | 0.9 | 5.7 | 38.5 | 18.2 | 3.5 | 0.6 | 22.5 | 6.1 | 1.5 | 0.5 | 8.2 |
| 1980 | 38.0 | 1.3 | 1.2 | 8.6 | 50.1 | 21.6 | 4.2 | 1.0 | 26.9 | 8.1 | 2.1 | 0.5 | 11.1 |
| 1981 | 44.9 | 2.9 | 1.2 | 10.7 | 60.8 | 26.8 | 6.1 | 0.8 | 33.8 | 8.3 | 2.4 | 0.4 | 11.1 |
| 1982 | 51.5 | 2.1 | 1.7 | 14.6 | 72.6 | 30.8 | 6.9 | 0.9 | 38.6 | 10.4 | 2.2 | 0.3 | 12.8 |
| 1983 | 38.2 | 1.1 | 0.8 | 6.9 | 48.0 | 21.8 | 5.3 | 2.1 | 29.2 | 7.2 | 1.8 | 0.1 | 9.1 |
| 1984 | 66.8 | 1.6 | 1.0 | 7.9 | 78.7 | 42.1 | 6.8 | 0.9 | 49.7 | 14.0 | 2.8 | 0.2 | 17.1 |
| 1985 | 39.8 | 1.5 | 0.1 | 6.8 | 49.2 | 21.8 | 4.5 | 4.3 | 30.6 | 7.1 | 2.1 | (s) | 9.3 |
| 1986 | 30.2 | 0.7 | 0.2 | 7.8 | 39.7 | 12.7 | 4.5 | 5.3 | 22.5 | 5.5 | 2.1 | (s) | 7.7 |
| 1987 | 26.6 | 0.6 | 0.3 | 6.7 | 34.8 | 11.3 | 4.5 | 0.9 | 16.7 | 7.4 | 2.4 | 0.1 | 9.9 |
| 1988 | 39.1 | 0.6 | 0.4 | 9.7 | 49.7 | 17.8 | 6.8 | 0.7 | 25.3 | 10.3 | 3.3 | 0.2 | 13.7 |
| 1989 | 34.2 | 1.0 | 0.2 | 8.8 | 45.0 | 11.9 | 5.5 | 0.7 | 18.2 | 12.4 | 3.4 | 0.2 | 16.0 |
| 1990 | 33.2 | 0.9 | 0.2 | 9.8 | 45.5 | 12.6 | 6.2 | 1.1 | 20.0 | 10.1 | 3.0 | 0.2 | 13.2 |
| 1991 | 35.6 | 1.0 | 0.2 | 8.3 | 46.4 | 12.0 | 7.9 | 1.3 | 21.2 | 10.3 | 3.9 | 0.3 | 14.4 |
| 1992 | 31.3 | 0.9 | 0.2 | 8.3 | 42.0 | 8.8 | 7.4 | 1.0 | 17.3 | 10.2 | 3.6 | 0.2 | 14.0 |
| 1993 | 32.1 | 0.2 | 0.4 | 6.7 | 40.4 | 9.5 | 6.7 | 1.0 | 17.1 | 11.4 | 3.3 | 0.2 | 15.0 |
| 1994 | 31.2 | (s) | 0.3 | 6.3 | 39.1 | 10.9 | 6.3 | 0.8 | 18.1 | 9.8 | 3.1 | 0.3 | 13.1 |

[1] Nominal dollars.

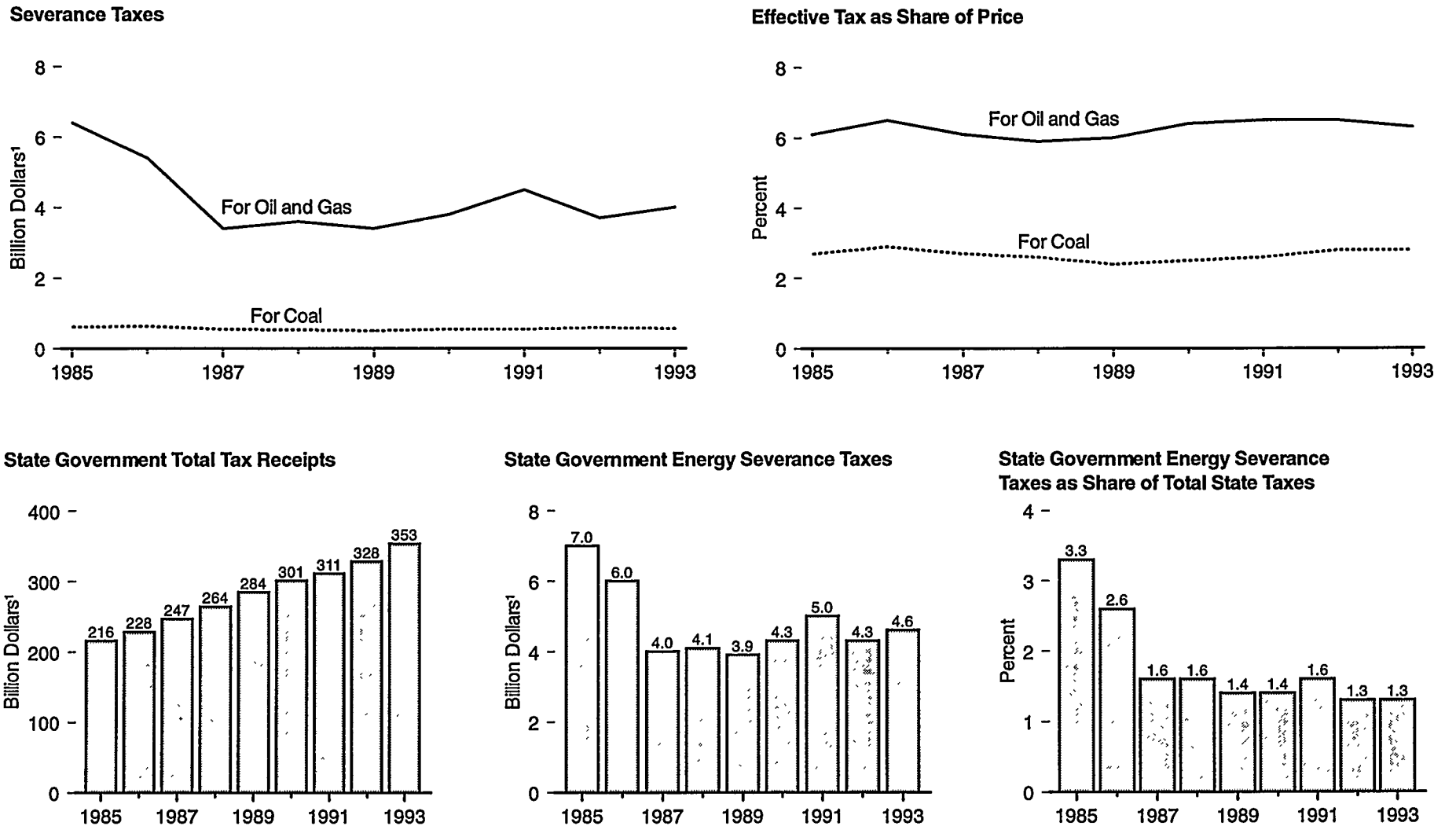
[2] Total is sum of components shown, plus nontraceables, which are defined in the glossary. Totals may not equal sum of components due to independent rounding.

(s)=Less than $50 million.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • Additions to investment in place is property, plant, and equipment, plus investments and advances.

Source: Energy Information Administration, *Performance Profiles of Major Energy Producers*, various issues.

# Figure 3.13 State Government Severance Taxes, 1985-1993




[1] Nominal dollars.

Notes: • A severance tax is a tax on the taking and use of natural resources imposed at the time the mineral or other product is extracted or severed from the earth. • An effective tax is a tax rate based on actual taxes paid divided by the taxable base. • Because vertical scales differ, graphs should not be compared.

Source: Table 3.13.

# Table 3.13 State Government Severance Taxes, 1985-1993

| Year | For Oil and Gas | | | | For Coal | | | | State Government Tax Receipts | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Severance Taxes | Effective Tax per Barrel [1] | Price per Barrel | Effective Tax as Share of Price | Severance Taxes | Effective Tax per Ton | Price per Short Ton | Effective Tax as Share of Price | Energy Severance Taxes | Total State Taxes | Energy Severance Taxes as Share of Total Taxes |
| | Billion Dollars [2] | Dollars [2] per Barrel | | Percent | Billion Dollars [2] | Dollars [2] per Short Ton | | Percent | Billion Dollars [2] | | Percent |
| 1985 | 6.4 | 1.17 | 19.19 | 6.1 | 0.6 | 0.68 | 25.41 | 2.7 | 7.0 | 215.9 | 3.3 |
| 1986 | 5.4 | 1.00 | 15.48 | 6.5 | 0.6 | 0.71 | 24.58 | 2.9 | 6.0 | 228.3 | 2.6 |
| 1987 | 3.4 | 0.66 | 10.84 | 6.1 | 0.6 | 0.63 | 23.25 | 2.7 | 4.0 | 246.5 | 1.6 |
| 1988 | 3.6 | 0.68 | 11.55 | 5.9 | 0.5 | 0.57 | 22.40 | 2.6 | 4.1 | 264.1 | 1.6 |
| 1989 | 3.4 | 0.66 | 11.03 | 6.0 | 0.5 | 0.52 | 21.78 | 2.4 | 3.9 | 284.4 | 1.4 |
| 1990 | 3.8 | 0.76 | 11.88 | 6.4 | 0.6 | 0.55 | 21.64 | 2.5 | 4.3 | 300.7 | 1.4 |
| 1991 | 4.5 | 0.89 | 13.72 | 6.5 | 0.6 | 0.55 | 21.31 | 2.6 | 5.0 | 311.1 | 1.6 |
| 1992 | 3.7 | 0.75 | 11.05 | 6.5 | 0.6 | 0.59 | 21.07 | 2.8 | 4.3 | 327.6 | 1.3 |
| 1993 | 4.0 | 0.81 | 12.77 | 6.3 | 0.6 | 0.57 | 20.33 | 2.8 | 4.6 | 353.3 | 1.3 |

[1] Natural gas is converted to barrels of crude oil equivalent on the basis of 0.178 barrels of oil per thousand cubic feet of gas.

[2] Nominal dollars.

Notes: • A severance tax is a tax on the taking and use of natural resources imposed at the time the mineral or other product is extracted or severed from the earth. • An effective tax is a tax rate based on actual taxes paid divided by the taxable base.

Sources: Energy Information Administration, *State Energy Severance Taxes, 1985-1993* (September 1995), Tables 1, 3, and 4.

# Table 3.14 Companies Reporting to the Financial Reporting System, 1975-1994

| Company | 1975-1981 | 1982 | 1983-84 | 1985-86 | 1987 | 1988 | 1989-90 | 1991 | 1992-93 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| Amerada Hess Corporation | X | X | X | X | X | X | X | X | X | X |
| American Petrofina Inc.[1] | X | X | X | X | X | X | X | | | |
| Amoco Corporation[2] | X | X | X | X | X | X | X | X | X | X |
| Anadarko Petroleum, Inc. | | | | | | | | | X | X |
| Ashland Oil, Inc. | X | X | X | X | X | X | X | X | X | X |
| Atlantic Richfield Co. (ARCO) | X | X | X | X | X | X | X | X | X | X |
| BP America, Inc.[3] | | | | | X | X | X | X | X | X |
| Burlington Northern Inc.[4] | X | X | X | X | X | | | | | |
| Burlington Resources Inc.[4] | | | | | | X | X | X | X | X |
| Chevron Corporation[5,6] | X | X | X | X | X | X | X | X | X | X |
| Cities Service[7] | X | X | | | | | | | | |
| Coastal Corporation | X | X | X | X | X | X | X | X | X | X |
| Conoco[8] | X | | | | | | | | | |
| E.I. du Pont de Nemours and Co.[8] | | X | X | X | X | X | X | X | X | X |
| Enron Corporation | | | | | | | | | X | X |
| Exxon Corporation | X | X | X | X | X | X | X | X | X | X |
| Fina, Inc.[1] | | | | | | | | X | X | X |
| Getty Oil[9] | X | X | X | | | | | | | |
| Gulf Oil[6] | X | X | X | | | | | | | |
| Kerr-McGee Corporation | X | X | X | X | X | X | X | X | X | X |
| Marathon[10] | X | | | | | | | | | |
| Mobil Corporation[11] | X | X | X | X | X | X | X | X | X | X |
| Nerco, Inc.[12] | | | | | | | | | X | |
| Occidental Petroleum Corporation[7] | X | X | X | X | X | X | X | X | X | X |
| Oryx Energy Company[13] | | | | | | X | X | X | X | X |
| Phillips Petroleum Company | X | X | X | X | X | X | X | X | X | X |
| Shell Oil Company | X | X | X | X | X | X | X | X | X | X |
| Standard Oil Co. (Ohio) (Sohio)[3] | X | X | X | X | | | | | | |
| Sun Company, Inc.[13] | X | X | X | X | X | X | X | X | X | X |
| Superior Oil[11] | X | X | X | | | | | | | |
| Tenneco Inc.[14] | X | X | X | X | X | X | | | | |
| Texaco Inc.[9] | X | X | X | X | X | X | X | X | X | X |
| Total Petroleum (North America) Ltd.[15] | | | | | | | X | X | | |
| Union Pacific Corporation | X | X | X | X | X | X | X | X | X | X |
| Unocal Corporation | X | X | X | X | X | X | X | X | X | X |
| USX Corporation[10] | | X | X | X | X | X | X | X | X | X |

[1] American Petrofina, Inc. changed its name to Fina, Inc. effective April 17, 1991.
[2] Formerly Standard Oil Company (Indiana).
[3] In 1987, British Petroleum acquired all shares in Standard Oil Company (Ohio) that it did not already control and renamed its U.S. affiliate British Petroleum America .
[4] Burlington Resources was added to the Financial Reporting System (FRS) and Burlington Northern was dropped for 1988. Data for Burlington Resources cover the full year 1988 even though that company was not created until May of that year.
[5] Formerly Standard Oil Company of California.
[6] Chevron acquired Gulf Oil in 1984 but separate data for Gulf continued to be available for the full 1984 year.
[7] Occidental acquired Cities Service in 1982. Separate financial reports were available for 1982, so each company continued to be treated separately until 1983.
[8] DuPont acquired Conoco in 1981. Separate data for Conoco were available for 1981. DuPont was included in the FRS system in 1982.
[9] Texaco acquired Getty in 1984; however, Getty was treated as a separate FRS company for that year.
[10] U.S. Steel (now USX) acquired Marathon in 1982.
[11] Mobil acquired Superior in 1984 but both companies were treated separately for that year.
[12] RTZ America acquired the common stock of Nerco, Inc., on February 17, 1994. In September 1993, Nerco, Inc., sold Nerco Oil & Gas, Inc., its subsidiary. Nerco's 1993 submission includes operations of Nerco Oil & Gas, Inc., through September 28, 1993.
[13] Sun Company spun off Sun Exploration and Development Company (later renamed Oryx Energy Company) during 1988. Both companies were included in the FRS system for 1988; therefore, some degree of duplication exists for that year.
[14] Tenneco sold its worldwide oil and gas assets and its refining and marketing assets in 1988. Other FRS companies purchased approximately 70 percent of Tenneco's assets.
[15] Effective June 1, 1991, Total's exploration, production, and marketing operations in Canada were spun off to Total Oil & Gas, a new public entity.
Note: "X" indicates that the company was included in the FRS system for the year indicated.
Source: Energy Information Administration, Form EIA-28, "Financial Reporting System."

# 4. Energy Resources

## Crude Oil and Natural Gas Resources

The U.S. Department of the Interior's 1987 mean estimates of domestic undiscovered recoverable resources trapped in conventional reservoirs were 49 billion barrels of crude oil (of which 33.3 billion barrels were located onshore and in State jurisdiction waters, with 13.2 billion barrels of the latter located in or off Alaska), 399 trillion cubic feet of natural gas, and 8.6 billion barrels of natural gas liquids (4.1).* Only the onshore and State waters portion of the 1994 estimates were available in time for publication in this report; the 1994 estimates are 30.3 billion barrels of crude oil (of which 8.4 billion barrels occur in and off Alaska), 259 trillion cubic feet of natural gas, and 7.2 billion barrels of natural gas liquids.

## Crude Oil and Natural Gas Proved Reserves

The combined oil-equivalent proved reserves of crude oil, natural gas, and natural gas liquids increased every year from 1949 until 1968 (4.10), when, for the first time, production exceeded net additions to proved reserves. Except for the addition of Alaska's North Slope reserves in 1970, proved reserves trended downward, falling to 57 billion barrels oil equivalent in 1994. At the end of 1994, proved reserves were 24 billion barrels of crude oil (including lease condensate) and 172 trillion cubic feet of natural gas (4.2). Through 1994, crude oil cumulative production of 173 billion barrels from 40,001 fields equaled about 88 percent of estimated ultimate recovery, while natural gas cumulative production of 877 trillion cubic feet from 35,724 fields equaled about 84 percent of ultimate recovery.

## Coal Reserves

The Energy Information Administration has estimated that the demonstrated reserve base of coal contained 496 billion short tons at the beginning of 1995 (4.11). Although recoverability rates differ from site to site, about 55 percent of the demonstrated reserve base is estimated to be recoverable.

## Uranium Resources

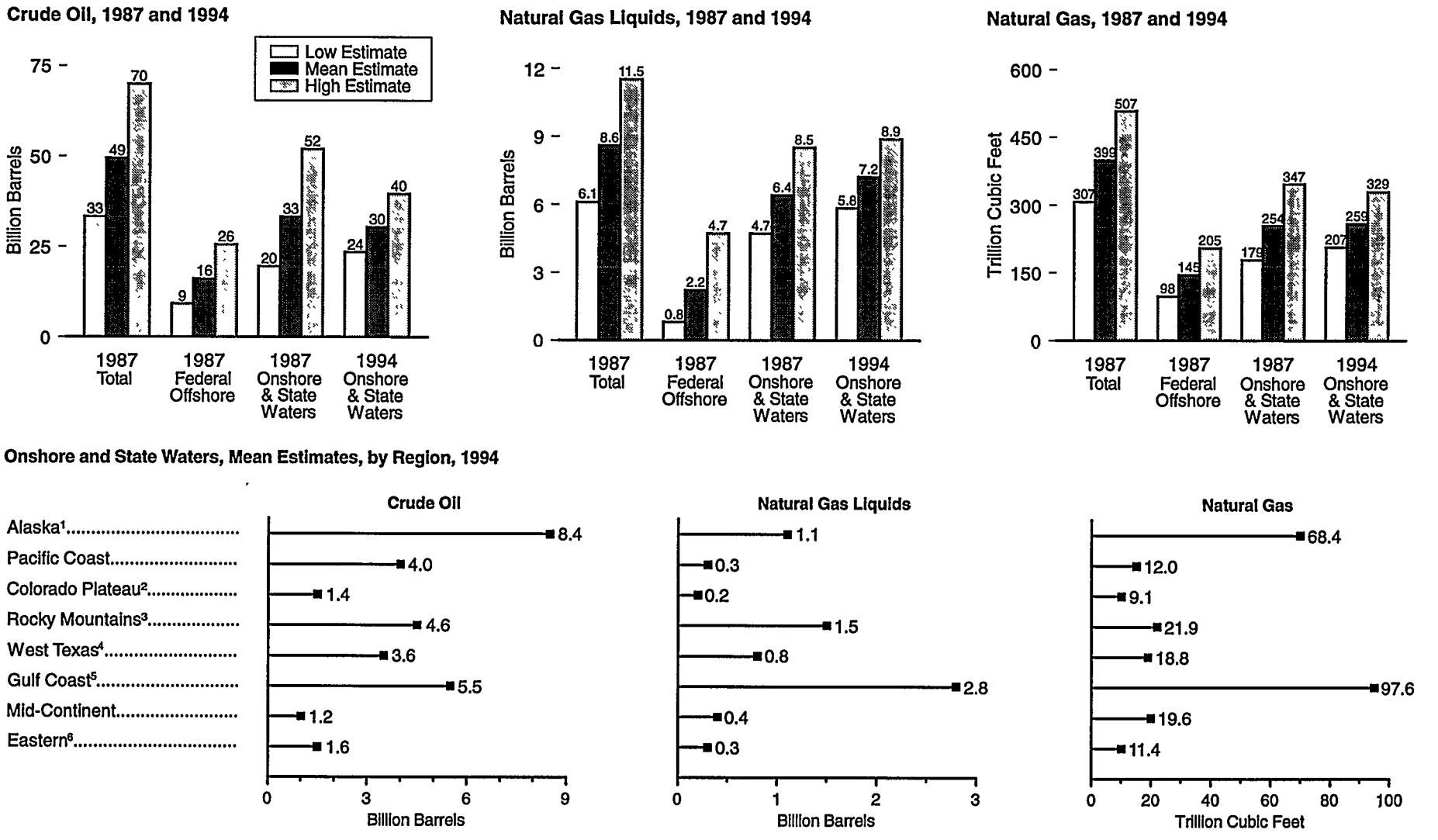
At the end of 1995, uranium reserves with forward costs (those yet to be incurred in production) of no more than $30 per pound totaled 290 million pounds of uranium oxide ($U_3O_8$), 40 percent of which was in Wyoming (4.13). Estimated additional resources and speculative resources in the $30-per-pound category in 1995 totaled 2.2 billion pounds and 1.3 billion pounds, respectively.

### Exploring for Energy Resources

Exploration for oil and gas is shaped by market conditions and technological developments. Market forces significantly decreased the number of rotary rigs in operation and the number of exploratory wells from highs in 1981 of 3,970 rigs and 17.5 thousand exploratory wells (4.3 and 4.5) to 723 rigs and 3.5 thousand exploratory wells in 1995. The use of new technologies, such as three-dimensional seismic surveying, multidisciplinary teams supported by a common and comprehensive computerized database, and horizontal drilling, has increased the efficiency of energy industry operations. During the 1990's, the percentage of successful wells drilled, particularly exploratory wells, generally increased (4.4). In 1995, 44 percent of oil and gas exploratory wells were successful, compared with 25 percent in 1990 (4.5). The percentage of successful oil and gas development wells rose from 82 percent in 1990 to 85 percent in 1995 (4.6).

Exploration for uranium also reflects changes in energy markets. The number of exploratory and development holes drilled peaked in 1978 at 104 thousand (4.12). As uranium market conditions deteriorated after 1978, the number plunged to fewer than 4 thousand per year in the mid-1980's. In 1995, the number of holes drilled totaled 2.3 thousand.

# Figure 4.1 Undiscovered Recoverable Resource Estimates for Petroleum




[1] Includes Arctic National Wildlife Refuge.
[2] And Basin and Range.
[3] And Northern Great Plains.
[4] And Eastern New Mexico.
[5] Includes all of Florida.
[6] Includes Michigan Basin, Illinois Basin, Black Warrior Basin, Cincinnati Arch, Appalachian Basin, Blue Ridge Thrust Belt, Piedmont, and Atlantic Coastal Plain.

Note: Because vertical and horizontal scales differ, graphs should not be compared.

Source: Table 4.1.

# Table 4.1 Undiscovered Recoverable Resource Estimates for Petroleum, 1987 and 1994

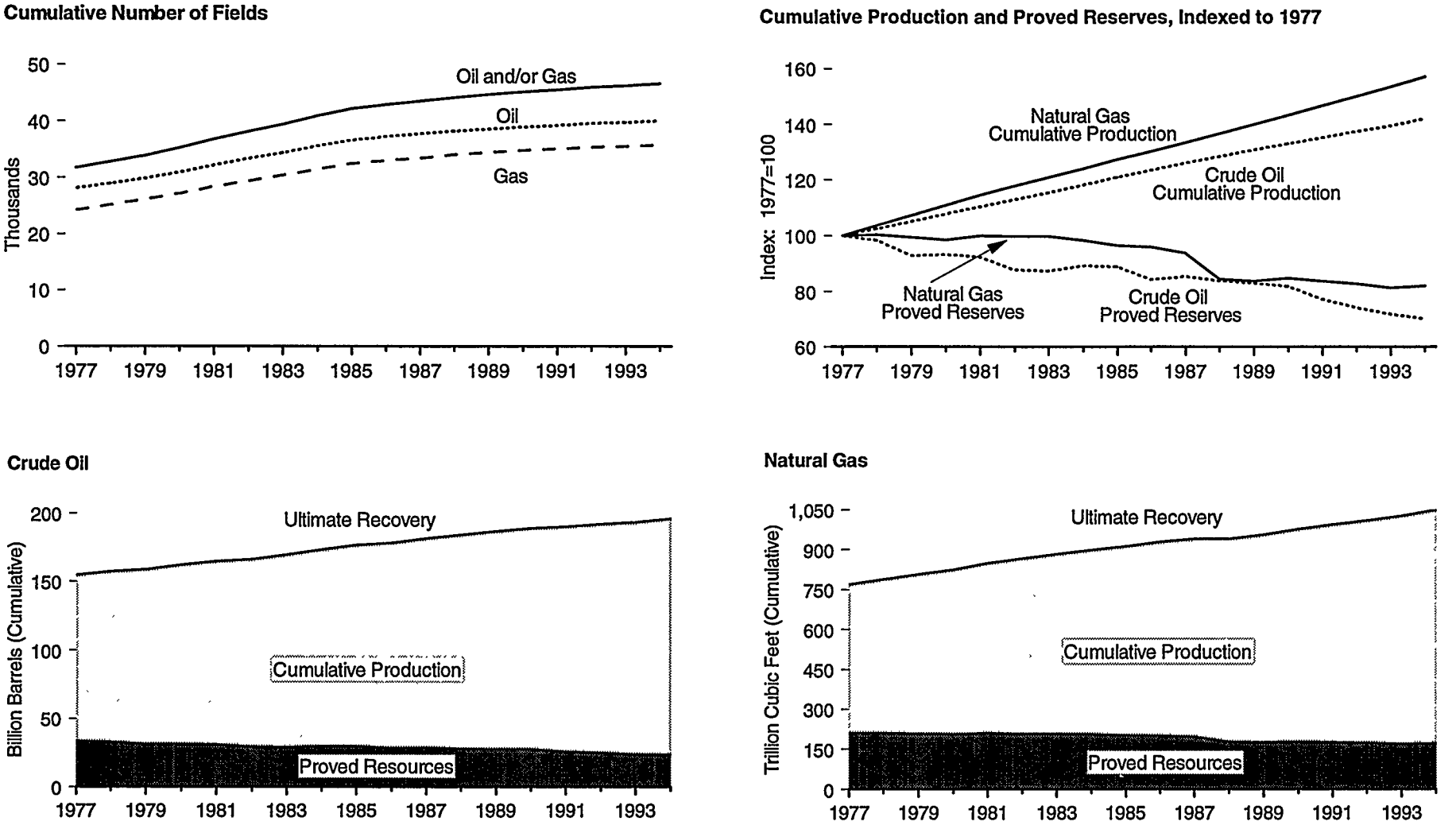
| Region | Crude Oil (billion barrels) | | | Natural Gas Liquids (billion barrels) | | | Natural Gas [1] (trillion cubic feet) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Estimated Range [2] | | | Estimated Range [2] | | | Estimated Range [2] | | |
| | Low | High | Mean [3] | Low | High | Mean [3] | Low | High | Mean [3] |
| | January 1, 1987 | | | | | | | | |
| **Onshore and State Waters** | 19.6 | 51.9 | 33.3 | 4.7 | 8.5 | 6.4 | 178.7 | 346.7 | 254.0 |
| Alaska [4] | 3.6 | 31.3 | 13.2 | NC | NC | NC | 15.6 | 138.6 | 57.9 |
| Pacific Coast | 1.5 | 6.6 | 3.5 | NC | NC | NC | 5.5 | 19.1 | 11.0 |
| Colorado Plateau and Basin and Range | 0.5 | 3.4 | 1.5 | NC | NC | NC | 9.6 | 39.3 | 21.3 |
| Rocky Mountains and Northern Great Plains | 2.7 | 6.9 | 4.5 | NC | NC | NC | 7.0 | 27.8 | 15.2 |
| West Texas and Eastern New Mexico | 1.5 | 4.0 | 2.6 | NC | NC | NC | 11.9 | 31.3 | 20.1 |
| Gulf Coast[5] | 2.4 | 6.7 | 4.2 | NC | NC | NC | 51.2 | 123.6 | 82.5 |
| Mid-Continent | 1.2 | 2.7 | 1.9 | NC | NC | NC | 16.2 | 46.0 | 28.7 |
| Eastern Interior [6] | 1.3 | 2.4 | 1.8 | NC | NC | NC | 10.8 | 25.7 | 17.2 |
| Atlantic Coast | 0.1 | 0.5 | 0.2 | NC | NC | NC | (s) | (s) | (s) |
| **Federal Offshore** | 9.2 | 25.6 | 16.1 | 0.8 | 4.7 | 2.2 | 97.8 | 204.8 | 145.1 |
| Alaska [4,7] | 0.6 | 9.4 | 3.4 | NC | NC | NC | 4.7 | 39.4 | 16.8 |
| Pacific Coast | 0.9 | 8.3 | 3.4 | NC | NC | NC | 3.5 | 15.1 | 8.0 |
| Gulf of Mexico | 4.9 | 13.6 | 8.6 | NC | NC | NC | 63.0 | 156.9 | 103.3 |
| Atlantic Coast | 0.1 | 2.3 | 0.7 | NC | NC | NC | 6.8 | 33.7 | 17.0 |
| **United States Total** | 33.2 | 69.9 | 49.4 | 6.1 | 11.5 | 8.6 | 306.8 | 507.2 | 399.1 |
| | January 1, 1994 | | | | | | | | |
| **Onshore and State Waters** | 23.5 | 39.6 | 30.3 | 5.82 | 8.87 | 7.2 | 207.1 | 329.1 | 258.7 |
| Alaska [4] | 3.2 | 16.8 | 8.4 | 0.4 | 2.1 | 1.1 | 27.9 | 129.2 | 68.4 |
| Pacific Coast | 2.6 | 5.9 | 4.0 | 0.2 | 0.4 | 0.3 | 7.7 | 17.7 | 12.0 |
| Colorado Plateau and Basin and Range | 0.7 | 2.5 | 1.4 | 0.1 | 0.4 | 0.2 | 5.5 | 15.3 | 9.1 |
| Rocky Mountains and Northern Great Plains | 3.1 | 6.8 | 4.6 | 0.8 | 2.2 | 1.5 | 15.2 | 31.1 | 21.9 |
| West Texas and Eastern New Mexico | 2.2 | 5.3 | 3.6 | 0.5 | 1.0 | 0.8 | 12.9 | 25.8 | 18.8 |
| Gulf Coast[5] | 2.7 | 8.9 | 5.5 | 1.9 | 3.9 | 2.8 | 70.9 | 130.2 | 97.6 |
| Mid-Continent | 0.8 | 1.8 | 1.2 | 0.3 | 0.5 | 0.4 | 13.6 | 27.5 | 19.6 |
| Eastern[6] | 0.9 | 2.5 | 1.6 | 0.2 | 0.4 | 0.3 | 7.9 | 15.8 | 11.4 |
| **Federal Offshore** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Alaska [4,7] | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pacific Coast | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Gulf of Mexico | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Atlantic Coast | ([8]) | ([8]) | ([8]) | ([8]) | ([8]) | ([8]) | ([8]) | ([8]) | ([8]) |
| **United States Total** | NA | NA | NA | NA | NA | NA | NA | NA | NA |

[1] See Note 1 at end of section.
[2] The low value of the range is the quantity associated with a 95 percent probability (19 in 20 chance) that there is at least this amount. The high value is the quantity with a 5 percent probability (1 in 20 chance) that there is at least this amount. Totals for the low and high values are not obtained by arithmetic summation; they are derived by statistical methods.
[3] The arithmetic average of all possible outcomes.
[4] Includes Arctic National Wildlife Refuge.
[5] Includes Western Florida Panhandle 1987, all of Florida for 1994.
[6] Includes the Michigan Basin, Illinois Basin, Black Warrior Basin, Cincinnati Arch, Appalachian Basin, Blue Ridge Thrust Belt, and Piedmont, and for 1994 the Atlantic Coastal Plain.
[7] Includes quantities considered recoverable only if technology permits their exploitation beneath Arctic ice — a condition not yet met.
[8] Region (Atlantic Coast off-shore) not used in 1994.
(s)=Less than 0.1 trillion cubic feet. NA=Not available. NC=Not calculated.

Note: The estimates are risked for the probability that economically recoverable hydrocarbons exist in the area. When applied to the mean volume, the methodology adjusts the figure to reflect the probability that the area may be nonproductive.

Sources: **1987 Estimates:** U.S. Department of the Interior, U.S. Geological Survey and Minerals Management Service, *Estimates of Undiscovered Recoverable Conventional Oil and Gas Resources in the United States - A Part of the Nation's Energy Endowment, 1989.* **1994 Estimates (onshore and State offshore):** U.S. Geological Survey , *1995 National Assessment of Oil and Gas Resources,* Circular 1118.

## Figure 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, End of Year 1977-1994




Notes: • Crude oil includes lease condensate. • Natural gas is wet, after lease separation.

Source: Table 4.2.

# Table 4.2 Crude Oil and Natural Gas Field Counts, Cumulative Production, Proved Reserves, and Ultimate Recovery, End of Year 1977-1994

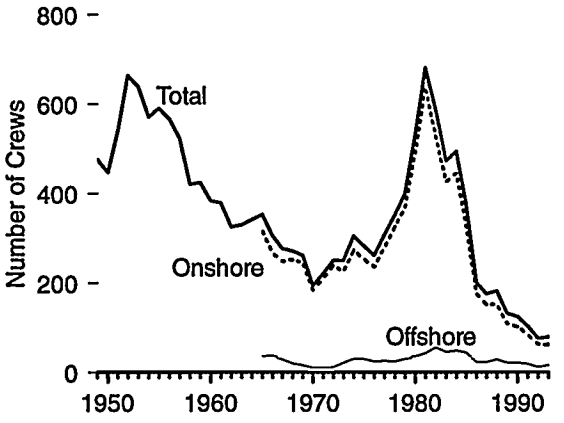
| Year | Cumulative Number of Fields with Oil and/or Gas [3] | Cumulative Number of Fields with Oil [3] | Crude Oil [1] (billion barrels) | | | Cumulative Number of Fields with Gas [3] | Natural Gas [2] (trillion cubic feet) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Cumulative Production | Proved Reserves | Ultimate Recovery | | Cumulative Production | Proved Reserves | Ultimate Recovery |
| 1977 | 31,725 | 28,057 | 121.4 | 33.6 | 155.0 | 24,266 | 558.3 | 209.5 | 767.8 |
| 1978 | 32,755 | 28,877 | 124.6 | 33.1 | 157.6 | 25,126 | 578.4 | 210.1 | 788.5 |
| 1979 | 33,898 | 29,810 | 127.7 | 31.2 | 158.9 | 26,094 | 599.1 | 208.3 | 807.4 |
| 1980 | 35,196 | 30,860 | 130.8 | 31.3 | 162.2 | 27,129 | 619.4 | 206.3 | 825.6 |
| 1981 | 36,727 | 32,124 | 133.9 | 31.0 | 165.0 | 28,331 | 639.4 | 209.4 | 848.9 |
| 1982 | 38,110 | 33,289 | 137.1 | 29.5 | 166.6 | 29,374 | 658.1 | 209.3 | 867.4 |
| 1983 | 39,403 | 34,345 | 140.3 | 29.3 | 169.6 | 30,349 | 675.1 | 209.0 | 884.1 |
| 1984 | 40,865 | 35,558 | 143.5 | 30.0 | 173.5 | 31,449 | 693.5 | 206.0 | 899.5 |
| 1985 | 42,114 | 36,590 | 146.8 | 29.9 | 176.7 | 32,419 | 710.9 | 202.2 | 913.1 |
| 1986 | 42,869 | 37,195 | 150.0 | 28.3 | 178.3 | 32,963 | 727.8 | 201.1 | 928.9 |
| 1987 | 43,535 | 37,703 | 153.0 | 28.7 | 181.7 | 33,469 | 745.4 | 196.4 | 941.8 |
| 1988 | 44,197 | 38,215 | 156.0 | 28.2 | 184.2 | 33,996 | 763.4 | 177.0 | 940.4 |
| 1989 | 44,655 | 38,555 | 158.8 | 27.9 | 186.7 | 34,367 | 781.7 | 175.4 | 957.1 |
| 1990 | 45,157 | 38,933 | 161.5 | 27.6 | 189.0 | 34,757 | 800.4 | 177.6 | 978.0 |
| 1991 | 45,539 | 39,233 | 164.2 | 25.9 | 190.1 | 35,022 | 819.1 | 175.3 | 994.4 |
| 1992 | 45,898 | 39,508 | 166.8 | 25.0 | 191.8 | 35,283 | 838.0 | 173.3 | 1,011.3 |
| 1993 | 46,220 | 39,737 | 169.3 | 24.1 | 193.4 | 35,490 | 857.4 | 170.5 | 1,027.9 |
| 1994 | 46,597 | 40,001 | 172.5 | 23.6 | 196.2 | 35,724 | 877.3 | 171.9 | 1,049.2 |

[1] Includes lease condensate.
[2] Wet, after lease separation.
[3] The field-count historical data are all revised to reflect up-to-date redeterminations of the limits of distinct oil and gas fields and improved information concerning their discovery dates.

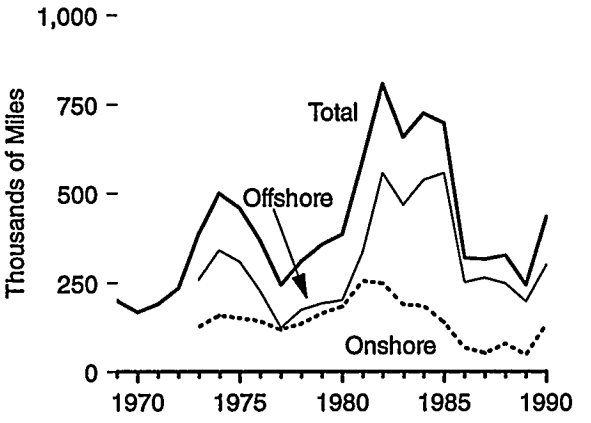
Sources: **1992:** Energy Information Administration (EIA), Office of Oil and Gas, Oil and Gas Integrated Field File (OGIFF), (July 1995). **1977-1991 and 1993-1994:** • Crude Oil Cumulative Production—EIA, *Petroleum Supply Annual 1994, Volume 1* (June 1995). • Natural Gas Cumulative Production—EIA, *Natural Gas Annual 1994, Volume 1* (November 1995). • Proved Reserves—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1994 Annual Report* (October 1995). • Field Counts—EIA, *Oil and Gas Field Code Master List 1995* (December 1995) and OGIFF.

## Figure 4.3 Oil and Gas Drilling Activity Measurements

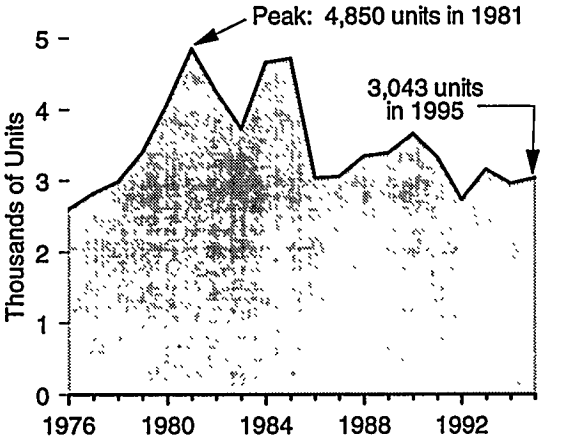
**Crews Engaged in Seismic Exploration, 1949-1993**



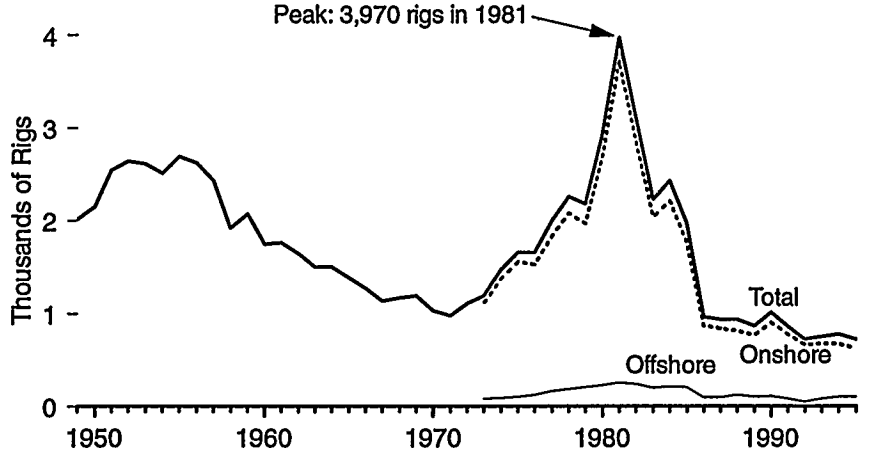

**Line Miles of Seismic Surveys, 1969-1990**



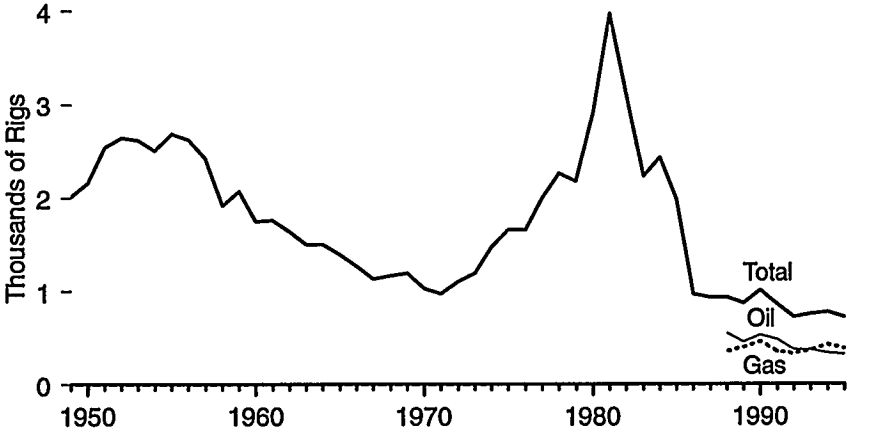

**Active Well Servicing Units, 1976-1995**




**Rotary Rigs in Operation by Site, 1949-1995**




**Rotary Rigs in Operation by Type, 1949-1995**




Source: Table 4.3.

# Table 4.3 Oil and Gas Drilling Activity Measurements, 1949-1995

| Year | Crews Engaged in Seismic Exploration | | | Line Miles of Seismic Surveys (thousand) | | | Rotary Rigs in Operation [1] | | | | | Active Well Servicing Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | By Site | | By Type | | | |
| | Offshore | Onshore | Total | Offshore | Onshore | Total | Offshore | Onshore | Oil | Gas | Total [2] | |
| 1949 | NA | NA | 476 | NA | NA | NA | NA | NA | NA | NA | 2,017 | NA |
| 1950 | NA | NA | 448 | NA | NA | NA | NA | NA | NA | NA | 2,154 | NA |
| 1951 | NA | NA | 545 | NA | NA | NA | NA | NA | NA | NA | 2,543 | NA |
| 1952 | NA | NA | 663 | NA | NA | NA | NA | NA | NA | NA | 2,641 | NA |
| 1953 | NA | NA | 639 | NA | NA | NA | NA | NA | NA | NA | 2,613 | NA |
| 1954 | NA | NA | 572 | NA | NA | NA | NA | NA | NA | NA | 2,508 | NA |
| 1955 | NA | NA | 591 | NA | NA | NA | NA | NA | NA | NA | 2,686 | NA |
| 1956 | NA | NA | 568 | NA | NA | NA | NA | NA | NA | NA | 2,620 | NA |
| 1957 | NA | NA | 524 | NA | NA | NA | NA | NA | NA | NA | 2,426 | NA |
| 1958 | NA | NA | 422 | NA | NA | NA | NA | NA | NA | NA | 1,922 | NA |
| 1959 | NA | NA | 425 | NA | NA | NA | NA | NA | NA | NA | 2,071 | NA |
| 1960 | NA | NA | 385 | NA | NA | NA | NA | NA | NA | NA | 1,748 | NA |
| 1961 | NA | NA | 380 | NA | NA | NA | NA | NA | NA | NA | 1,761 | NA |
| 1962 | NA | NA | 326 | NA | NA | NA | NA | NA | NA | NA | 1,641 | NA |
| 1963 | NA | NA | 331 | NA | NA | NA | NA | NA | NA | NA | 1,499 | NA |
| 1964 | NA | NA | 342 | NA | NA | NA | NA | NA | NA | NA | 1,501 | NA |
| 1965 | 36 | 318 | 354 | NA | NA | NA | NA | NA | NA | NA | 1,388 | NA |
| 1966 | 38 | 268 | 306 | NA | NA | NA | NA | NA | NA | NA | 1,272 | NA |
| 1967 | 29 | 249 | 278 | NA | NA | NA | NA | NA | NA | NA | 1,135 | NA |
| 1968 | 20 | 252 | 272 | NA | NA | NA | NA | NA | NA | NA | 1,169 | NA |
| 1969 | 16 | 247 | 263 | NA | NA | 199.9 | NA | NA | NA | NA | 1,194 | NA |
| 1970 | 10 | 185 | 195 | NA | NA | 167.3 | NA | NA | NA | NA | 1,028 | NA |
| 1971 | 10 | 211 | 221 | NA | NA | 191.7 | NA | NA | NA | NA | 976 | NA |
| 1972 | 12 | 239 | 251 | NA | NA | 235.7 | NA | NA | NA | NA | 1,107 | NA |
| 1973 | 23 | 227 | 250 | 258.9 | 127.2 | 386.1 | 84 | 1,110 | NA | NA | 1,194 | NA |
| 1974 | 31 | 274 | 305 | 341.8 | 158.6 | 500.4 | 94 | 1,378 | NA | NA | 1,472 | NA |
| 1975 | 30 | 254 | 284 | 309.3 | 150.7 | 460.0 | 106 | 1,554 | NA | NA | 1,660 | NA |
| 1976 | 25 | 237 | 262 | 226.3 | 142.9 | 369.2 | 129 | 1,529 | NA | NA | 1,658 | 2,601 |
| 1977 | 27 | 281 | 308 | 124.7 | 120.1 | 244.7 | 167 | 1,834 | NA | NA | 2,001 | 2,828 |
| 1978 | 25 | 327 | 352 | 174.6 | 135.9 | 310.5 | 185 | 2,074 | NA | NA | 2,259 | 2,988 |
| 1979 | 30 | 370 | 400 | 193.2 | 163.9 | 357.1 | 207 | 1,970 | NA | NA | 2,177 | 3,399 |
| 1980 | 37 | 493 | 530 | 202.7 | 184.1 | 386.8 | 231 | 2,678 | NA | NA | 2,909 | 4,089 |
| 1981 | 44 | 637 | 681 | 338.2 | 256.2 | 594.4 | 256 | 3,714 | NA | NA | 3,970 | 4,850 |
| 1982 | 57 | 531 | 588 | 558.5 | 248.5 | 806.9 | 243 | 2,862 | NA | NA | 3,105 | 4,248 |
| 1983 | 47 | 426 | 473 | 469.2 | 188.5 | 657.7 | 199 | 2,033 | NA | NA | 2,232 | 3,732 |
| 1984 | 49 | 445 | 494 | 538.5 | 185.9 | 724.4 | 213 | 2,215 | NA | NA | 2,428 | 4,663 |
| 1985 | 45 | 333 | 378 | 557.7 | 140.0 | 697.7 | 206 | 1,774 | NA | NA | 1,980 | 4,716 |
| 1986 | 24 | 176 | 200 | 252.6 | 67.6 | 320.2 | 99 | 865 | NA | NA | 964 | 3,036 |
| 1987 | 24 | 153 | 177 | 263.7 | 52.7 | 316.5 | 95 | 841 | NA | NA | 936 | 3,060 |
| 1988 | 29 | 153 | 182 | 248.6 | 79.5 | 328.1 | 123 | 813 | 554 | 354 | 936 | 3,341 |
| 1989 | 23 | 109 | 132 | 197.4 | 48.0 | 245.5 | 105 | 764 | 453 | 401 | 869 | 3,391 |
| 1990 | 23 | 102 | 125 | 300.2 | 134.2 | 434.5 | 108 | 902 | 532 | 464 | 1,010 | 3,658 |
| 1991 | 19 | 85 | 104 | NA | NA | NA | 81 | 779 | 482 | 351 | 860 | 3,331 |
| 1992 | 12 | 64 | 76 | NA | NA | NA | 52 | 669 | 373 | 331 | 721 | 2,732 |
| 1993 | 16 | 63 | 79 | NA | NA | NA | 82 | 672 | 373 | 364 | 754 | 3,158 |
| 1994 | NA | NA | NA | NA | NA | NA | 102 | 673 | 335 | 427 | 775 | 2,961 |
| 1995 | NA | NA | NA | NA | NA | NA | 101 | 622 | 323 | 385 | 723 | 3,043 |

[1] Data are not for the exact calendar year but for the 52 or 53 consecutive whole weeks that most nearly coincide with the calendar year.

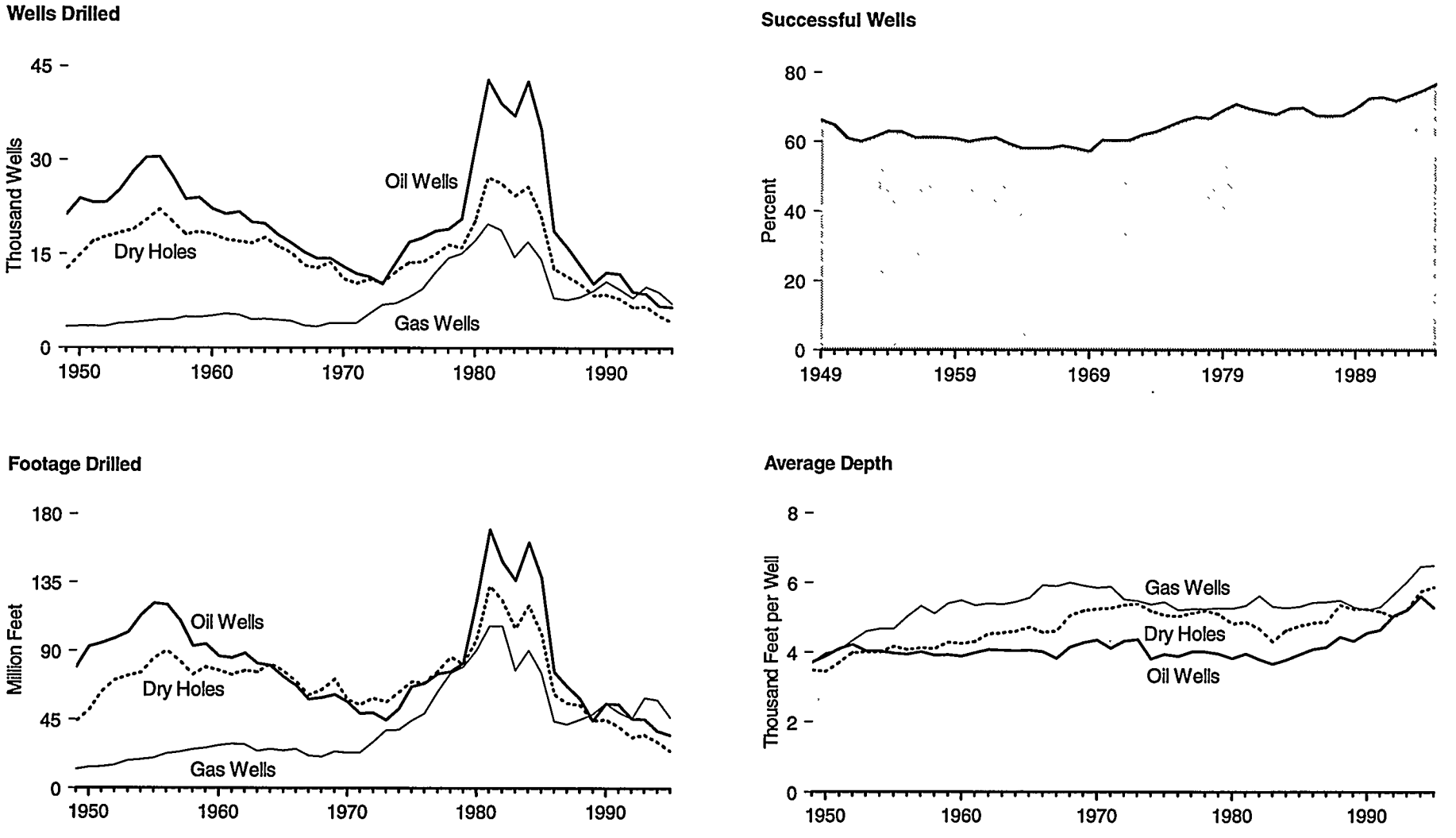
[2] Sum of oil, gas, and miscellaneous other rigs, which is not shown.

NA=Not available.

Notes: • Geographic coverage is the 50 States and the District of Columbia. • Totals may not equal sum of components due to independent rounding.

Sources: **Crews Engaged in Seismic Exploration** and **Line Miles of Seismic Surveys:** Society of Exploration Geophysicists, Tulsa, Oklahoma, *SEG News Release,* and *Geophysics: The Leading Edge of Exploration,* monthly. **Rotary Rigs in Operation:** Baker Hughes, Inc., Houston, Texas, *Rotary Rigs Running—By State.* **Active Well Servicing Units:** American Association of Oilwell Servicing Contractors, Dallas, Texas, *Well Servicing.*

# Figure 4.4 Oil and Gas Exploratory and Development Wells, 1949-1995




Source: Table 4.4.

# Table 4.4 Oil and Gas Exploratory and Development Wells, 1949-1995

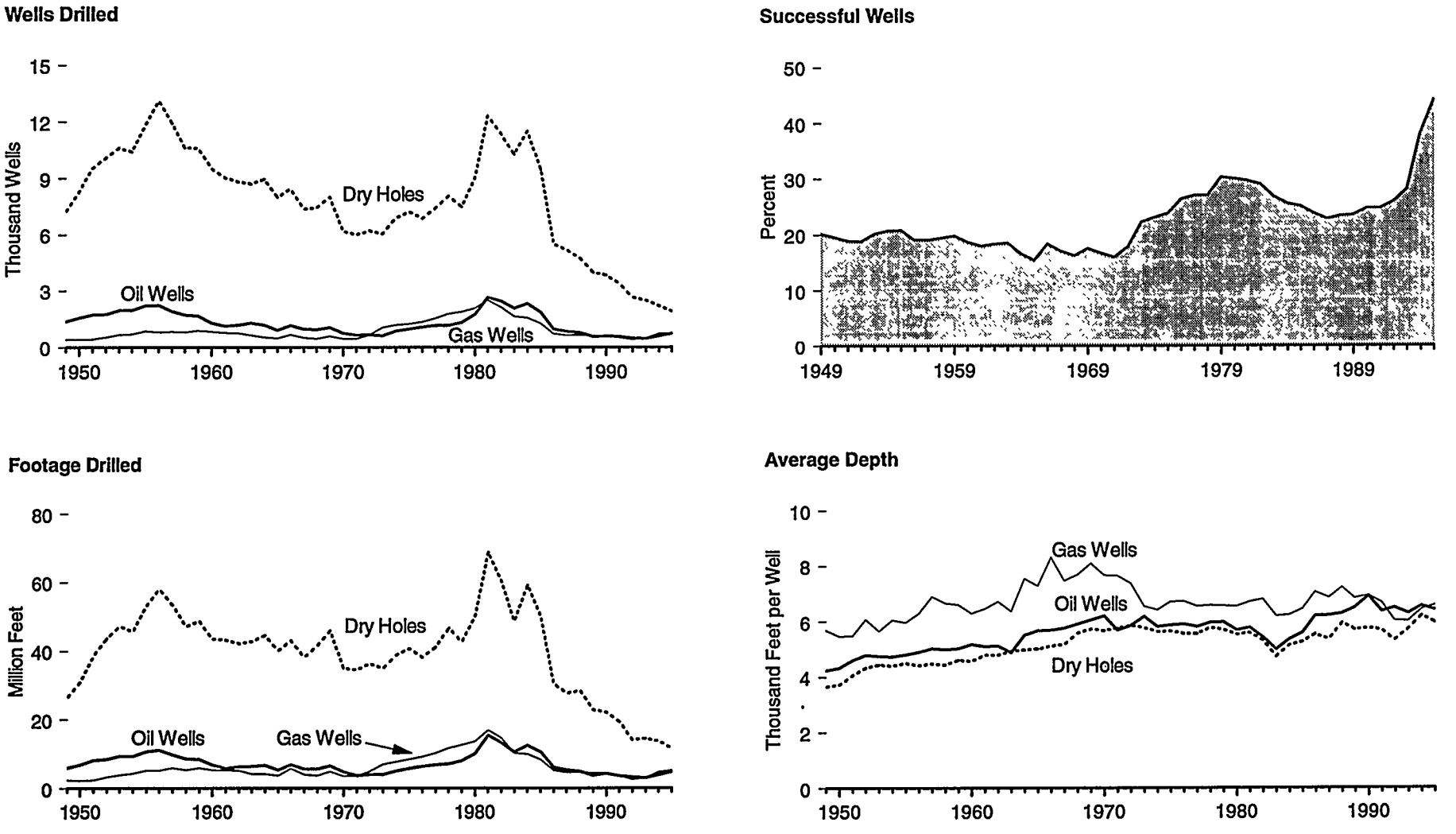
| Year | Wells Drilled (thousands) | | | | Successful Wells (percent) | Footage Drilled (million feet) | | | | Average Depth (feet per well) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oil | Gas | Dry Holes | Total | | Oil | Gas | Dry Holes | Total | Oil | Gas | Dry Holes | Total |
| 1949 | 21.35 | 3.36 | 12.60 | 37.31 | 66.2 | 79.4 | 12.4 | 43.8 | 135.6 | 3,720 | 3,698 | 3,473 | 3,635 |
| 1950 | 23.81 | 3.44 | 14.80 | 42.05 | 64.8 | 92.7 | 13.7 | 51.0 | 157.4 | 3,893 | 3,979 | 3,445 | 3,742 |
| 1951 | 23.18 | 3.44 | 17.03 | 43.64 | 61.0 | 95.1 | 13.9 | 63.1 | 172.1 | 4,103 | 4,056 | 3,706 | 3,944 |
| 1952 | 23.29 | 3.51 | 17.76 | 44.56 | 60.1 | 98.1 | 15.3 | 70.7 | 184.1 | 4,214 | 4,342 | 3,983 | 4,132 |
| 1953 | 25.32 | 3.97 | 18.45 | 47.74 | 61.4 | 102.1 | 18.2 | 73.9 | 194.2 | 4,033 | 4,599 | 4,004 | 4,069 |
| 1954 | 28.14 | 4.04 | 18.93 | 51.11 | 63.0 | 113.4 | 18.9 | 75.8 | 208.0 | 4,028 | 4,670 | 4,004 | 4,070 |
| 1955 | 30.43 | 4.27 | 20.45 | 55.15 | 62.9 | 121.1 | 19.9 | 85.1 | 226.2 | 3,981 | 4,672 | 4,161 | 4,101 |
| 1956 | 30.53 | 4.53 | 22.11 | 57.17 | 61.3 | 120.4 | 22.7 | 90.2 | 233.3 | 3,942 | 5,018 | 4,079 | 4,080 |
| 1957 | 27.36 | 4.48 | 20.16 | 52.00 | 61.2 | 110.0 | 23.8 | 83.2 | 217.0 | 4,021 | 5,326 | 4,126 | 4,174 |
| 1958 | 23.77 | 5.01 | 18.16 | 46.94 | 61.3 | 93.1 | 25.6 | 74.6 | 193.3 | 3,916 | 5,106 | 4,110 | 4,118 |
| 1959 | 24.04 | 4.93 | 18.59 | 47.56 | 60.9 | 94.6 | 26.6 | 79.5 | 200.7 | 3,935 | 5,396 | 4,275 | 4,220 |
| 1960 | 22.26 | 5.15 | 18.21 | 45.62 | 60.1 | 86.6 | 28.2 | 77.4 | 192.2 | 3,889 | 5,486 | 4,248 | 4,213 |
| 1961 | 21.44 | 5.49 | 17.33 | 44.25 | 60.8 | 85.6 | 29.3 | 74.7 | 189.6 | 3,994 | 5,339 | 4,311 | 4,285 |
| 1962 | 21.73 | 5.35 | 17.08 | 44.16 | 61.3 | 88.4 | 28.9 | 77.3 | 194.6 | 4,070 | 5,408 | 4,524 | 4,408 |
| 1963 | 20.14 | 4.57 | 16.76 | 41.47 | 59.6 | 81.8 | 24.5 | 76.3 | 182.6 | 4,063 | 5,368 | 4,552 | 4,405 |
| 1964 | 19.91 | 4.69 | 17.69 | 42.29 | 58.2 | 80.5 | 25.6 | 81.4 | 187.4 | 4,042 | 5,453 | 4,598 | 4,431 |
| 1965 | 18.07 | 4.48 | 16.23 | 38.77 | 58.2 | 73.3 | 24.9 | 76.6 | 174.9 | 4,059 | 5,562 | 4,723 | 4,510 |
| 1966 | 16.78 | 4.38 | 15.23 | 36.38 | 58.1 | 67.3 | 25.9 | 69.6 | 162.9 | 4,013 | 5,928 | 4,573 | 4,478 |
| 1967 | 15.33 | 3.66 | 13.25 | 32.23 | 58.9 | 58.6 | 21.6 | 61.1 | 141.4 | 3,825 | 5,898 | 4,616 | 4,385 |
| 1968 | 14.33 | 3.46 | 12.81 | 30.60 | 58.1 | 59.5 | 20.7 | 64.7 | 145.0 | 4,153 | 5,994 | 5,053 | 4,738 |
| 1969 | 14.37 | 4.08 | 13.74 | 32.19 | 57.3 | 61.6 | 24.2 | 71.4 | 157.1 | 4,286 | 5,918 | 5,195 | 4,881 |
| 1970 | 13.04 | 4.03 | 11.10 | 28.17 | 60.6 | 56.8 | 23.6 | 58.1 | 138.6 | 4,357 | 5,859 | 5,236 | 4,918 |
| 1971 | 11.90 | 3.98 | 10.38 | 26.27 | 60.5 | 49.1 | 23.4 | 54.8 | 127.3 | 4,121 | 5,880 | 5,276 | 4,845 |
| 1972 | 11.44 | 5.48 | 11.01 | 27.93 | 60.6 | 49.5 | 30.3 | 59.1 | 138.8 | 4,327 | 5,517 | 5,362 | 4,969 |
| 1973 | 10.25 | 6.98 | 10.47 | 27.69 | 62.2 | 44.8 | 38.2 | 56.5 | 139.4 | 4,366 | 5,478 | 5,394 | 5,035 |
| 1974 | 13.66 | 7.17 | 12.21 | 33.04 | 63.1 | 52.1 | 38.5 | 63.2 | 153.8 | 3,811 | 5,369 | 5,180 | 4,655 |
| 1975 | 16.98 | 8.17 | 13.74 | 38.89 | 64.7 | 66.9 | 44.5 | 69.6 | 181.0 | 3,942 | 5,445 | 5,069 | 4,656 |
| 1976 | 17.70 | 9.44 | 13.81 | 40.94 | 66.3 | 68.8 | 49.2 | 69.3 | 187.3 | 3,889 | 5,213 | 5,017 | 4,575 |
| 1977 | 18.70 | 12.12 | 15.04 | 45.86 | 67.2 | 75.2 | 63.5 | 77.0 | 215.7 | 4,021 | 5,240 | 5,121 | 4,704 |
| 1978 | 19.07 | 14.41 | 16.59 | 50.06 | 66.9 | 76.6 | 75.6 | 86.2 | 238.4 | 4,019 | 5,247 | 5,194 | 4,762 |
| 1979 | 20.70 | 15.17 | 16.04 | 51.91 | 69.1 | 82.1 | 79.9 | 81.7 | 243.7 | 3,967 | 5,266 | 5,092 | 4,694 |
| 1980 | 32.28 | 17.22 | 20.34 | 69.84 | 70.9 | 123.6 | 90.7 | 98.1 | 312.3 | 3,829 | 5,264 | 4,821 | 4,472 |
| 1981 | 42.84 | 19.91 | 27.28 | 90.03 | 69.7 | 169.4 | 106.5 | 132.9 | 408.8 | 3,955 | 5,350 | 4,871 | 4,541 |
| 1982 | 39.14 | 18.94 | 26.38 | 84.47 | 68.8 | 148.6 | 106.5 | 123.3 | 378.4 | 3,797 | 5,621 | 4,674 | 4,480 |
| 1983 | 37.20 | 14.56 | 24.34 | 76.09 | 68.0 | 136.6 | 77.6 | 104.9 | 319.1 | 3,665 | 5,315 | 4,305 | 4,185 |
| 1984 | 42.59 | 17.01 | 25.80 | 85.39 | 69.8 | 161.3 | 90.3 | 119.8 | 371.5 | 3,781 | 5,279 | 4,635 | 4,338 |
| 1985 | 35.02 | 14.25 | 21.21 | 70.48 | 69.9 | R138.3 | 75.9 | 101.2 | R315.4 | R3,948 | 5,309 | 4,759 | 4,433 |
| 1986 | 18.70 | 8.14 | 12.77 | 39.60 | 67.8 | R76.6 | R44.1 | R61.9 | R182.7 | R4,096 | R5,426 | R4,852 | R4,613 |
| 1987 | 16.19 | 7.76 | 11.48 | 35.42 | 67.6 | R67.1 | R42.3 | R55.9 | R165.3 | R4,147 | R5,452 | R4,869 | R4,667 |
| 1988 | 13.32 | 8.24 | 10.24 | 31.80 | 67.8 | R59.1 | R45.2 | R55.0 | R159.3 | R4,437 | R5,487 | R5,367 | R5,008 |
| 1989 | 10.34 | 9.23 | 8.49 | 28.06 | 69.7 | R44.6 | R48.9 | R44.5 | R138.0 | R4,316 | R5,300 | R5,245 | R4,920 |
| 1990E | 12.15 | R10.71 | 8.61 | R31.47 | R72.6 | R55.3 | R55.8 | R45.2 | R156.4 | R4,554 | R5,215 | R5,250 | R4,969 |
| 1991E | 11.91 | R9.45 | R7.91 | R29.27 | R73.0 | R55.3 | R50.2 | R40.9 | R146.4 | R4,643 | R5,307 | R5,172 | R5,000 |
| 1992E | R9.02 | R8.09 | R6.65 | R23.76 | 72.0 | R45.6 | R45.9 | R33.4 | R124.9 | R5,059 | R5,669 | R5,020 | R5,256 |
| 1993E | R8.73 | R9.86 | R6.73 | R25.32 | R73.4 | R45.6 | R59.5 | R35.2 | R140.3 | R5,221 | R6,037 | R5,234 | R5,542 |
| 1994E | R6.77 | R8.98 | R5.29 | R21.04 | R74.9 | R37.9 | R58.2 | R30.4 | R126.5 | R5,604 | R6,474 | R5,743 | R6,010 |
| 1995E | 6.64 | 7.23 | 4.21 | 18.08 | 76.7 | 35.1 | 47.0 | 24.7 | 106.8 | 5,291 | 6,494 | 5,877 | 5,909 |

R=Revised data. E=Estimate. See Note 2 at end of section.

Notes: • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" Issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute (1970-1994) and to the Petroleum Information Corporation (1995 forward).

## Figure 4.5 Oil and Gas Exploratory Wells, 1949-1995




Source: Table 4.5.

# Table 4.5 Oil and Gas Exploratory Wells, 1949-1995

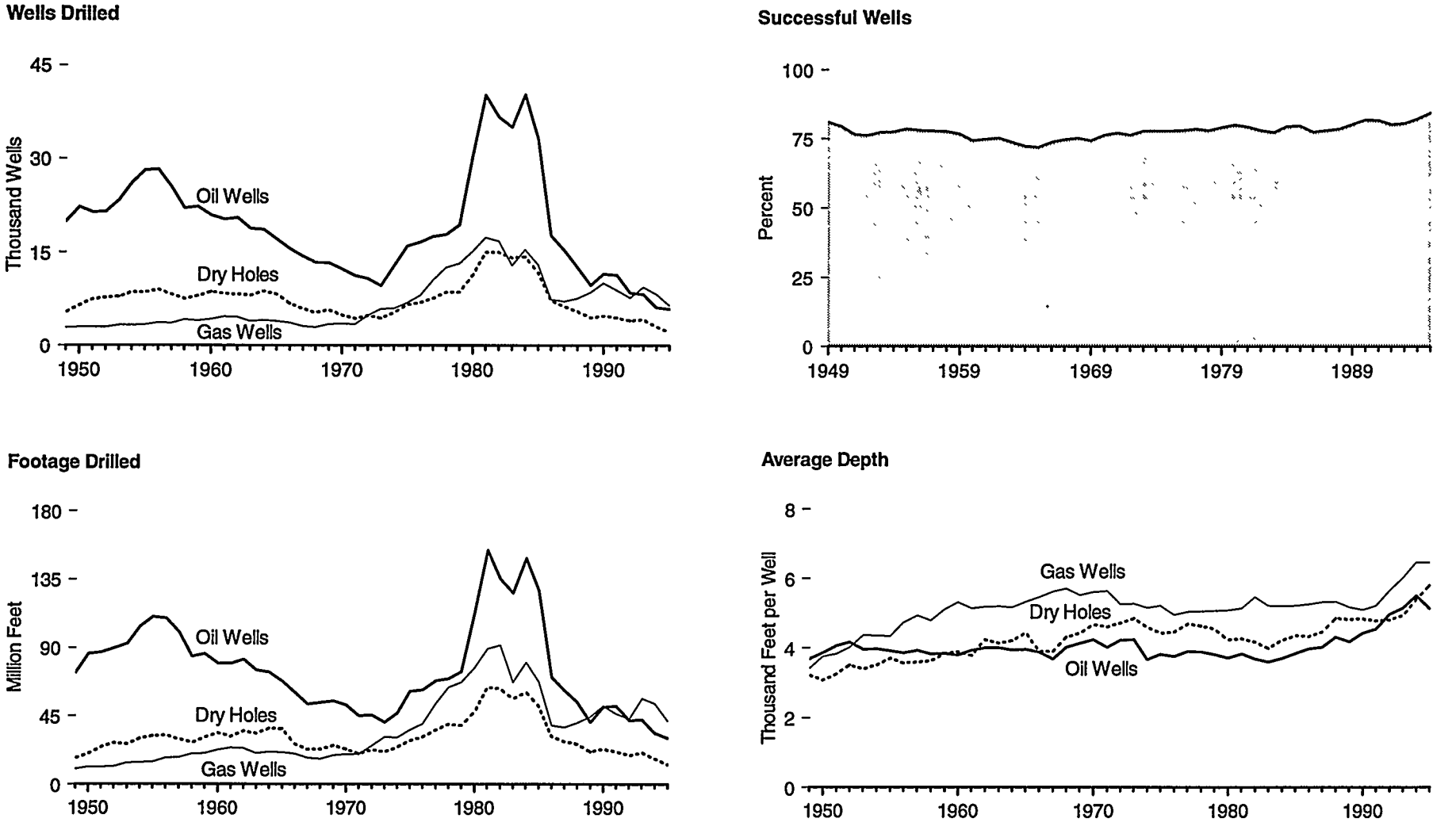
| Year | Wells Drilled (thousands) | | | | Successful Wells (percent) | Footage Drilled (million feet) | | | | Average Depth (feet per well) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oil | Gas | Dry Holes | Total | | Oil | Gas | Dry Holes | Total | Oil | Gas | Dry Holes | Total |
| 1949 | 1.41 | 0.42 | 7.23 | 9.06 | 20.2 | 6.0 | 2.4 | 26.4 | 34.8 | 4,232 | 5,682 | 3,658 | 3,842 |
| 1950 | 1.58 | 0.43 | 8.29 | 10.31 | 19.5 | 6.9 | 2.4 | 31.0 | 40.2 | 4,335 | 5,466 | 3,733 | 3,898 |
| 1951 | 1.76 | 0.45 | 9.54 | 11.76 | 18.9 | 8.1 | 2.5 | 38.7 | 49.3 | 4,609 | 5,497 | 4,059 | 4,197 |
| 1952 | 1.78 | 0.56 | 10.09 | 12.43 | 18.8 | 8.5 | 3.4 | 43.7 | 55.6 | 4,781 | 6,071 | 4,334 | 4,476 |
| 1953 | 1.98 | 0.70 | 10.63 | 13.31 | 20.1 | 9.4 | 4.0 | 47.3 | 60.7 | 4,761 | 5,654 | 4,447 | 4,557 |
| 1954 | 1.99 | 0.73 | 10.39 | 13.10 | 20.7 | 9.4 | 4.4 | 45.8 | 59.6 | 4,740 | 6,059 | 4,408 | 4,550 |
| 1955 | 2.24 | 0.87 | 11.83 | 14.94 | 20.8 | 10.8 | 5.2 | 53.2 | 69.2 | 4,819 | 5,964 | 4,498 | 4,632 |
| 1956 | 2.27 | 0.82 | 13.12 | 16.21 | 19.1 | 11.1 | 5.2 | 58.0 | 74.3 | 4,901 | 6,301 | 4,425 | 4,587 |
| 1957 | 1.95 | 0.87 | 11.90 | 14.71 | 19.1 | 9.8 | 6.0 | 53.4 | 69.2 | 5,036 | 6,898 | 4,488 | 4,702 |
| 1958 | 1.75 | 0.82 | 10.63 | 13.20 | 19.4 | 8.7 | 5.5 | 47.3 | 61.5 | 4,993 | 6,657 | 4,449 | 4,658 |
| 1959 | 1.70 | 0.91 | 10.58 | 13.19 | 19.8 | 8.5 | 6.0 | 48.7 | 63.3 | 5,021 | 6,613 | 4,602 | 4,795 |
| 1960 | 1.32 | 0.87 | 9.52 | 11.70 | 18.7 | 6.8 | 5.5 | 43.5 | 55.8 | 5,170 | 6,298 | 4,575 | 4,770 |
| 1961 | 1.16 | 0.81 | 9.02 | 10.99 | 17.9 | 5.9 | 5.2 | 43.3 | 54.4 | 5,099 | 6,457 | 4,799 | 4,953 |
| 1962 | 1.21 | 0.77 | 8.82 | 10.80 | 18.4 | 6.2 | 5.2 | 42.2 | 53.6 | 5,124 | 6,728 | 4,790 | 4,966 |
| 1963 | 1.31 | 0.66 | 8.69 | 10.66 | 18.5 | 6.4 | 4.2 | 42.8 | 53.5 | 4,878 | 6,370 | 4,933 | 5,016 |
| 1964 | 1.22 | 0.56 | 8.95 | 10.73 | 16.6 | 6.7 | 4.2 | 44.6 | 55.5 | 5,509 | 7,547 | 4,980 | 5,174 |
| 1965 | 0.95 | 0.52 | 8.01 | 9.47 | 15.4 | 5.4 | 3.8 | 40.1 | 49.2 | 5,672 | 7,295 | 5,007 | 5,198 |
| 1966 | 1.20 | 0.70 | 8.42 | 10.31 | 18.4 | 6.8 | 5.8 | 43.1 | 55.7 | 5,700 | 8,321 | 5,117 | 5,402 |
| 1967 | 0.99 | 0.53 | 7.36 | 8.88 | 17.1 | 5.7 | 4.0 | 38.2 | 47.8 | 5,758 | 7,478 | 5,188 | 5,388 |
| 1968 | 0.95 | 0.49 | 7.44 | 8.88 | 16.2 | 5.6 | 3.7 | 41.6 | 51.0 | 5,914 | 7,697 | 5,589 | 5,739 |
| 1969 | 1.08 | 0.62 | 8.00 | 9.70 | 17.5 | 6.6 | 5.0 | 45.9 | 57.5 | 6,054 | 8,092 | 5,739 | 5,924 |
| 1970 | 0.76 | 0.48 | 6.19 | 7.43 | 16.7 | 4.7 | 3.7 | 35.1 | 43.5 | 6,198 | 7,669 | 5,671 | 5,854 |
| 1971 | 0.66 | 0.47 | 6.00 | 7.13 | 15.9 | 3.8 | 3.6 | 34.6 | 42.0 | 5,702 | 7,654 | 5,765 | 5,885 |
| 1972 | 0.69 | 0.66 | 6.20 | 7.55 | 17.9 | 4.0 | 4.9 | 36.4 | 45.3 | 5,858 | 7,393 | 5,863 | 5,996 |
| 1973 | 0.65 | 1.08 | 6.04 | 7.77 | 22.3 | 4.0 | 7.1 | 34.9 | 46.0 | 6,187 | 6,556 | 5,785 | 5,926 |
| 1974 | 0.87 | 1.21 | 6.89 | 8.97 | 23.1 | 5.1 | 7.7 | 38.9 | 51.7 | 5,826 | 6,425 | 5,637 | 5,761 |
| 1975 | 0.99 | 1.26 | 7.21 | 9.46 | 23.8 | 5.8 | 8.5 | 40.8 | 55.1 | 5,875 | 6,714 | 5,655 | 5,819 |
| 1976 | 1.10 | 1.36 | 6.85 | 9.32 | 26.4 | 6.5 | 9.2 | 38.2 | 53.9 | 5,903 | 6,748 | 5,575 | 5,785 |
| 1977 | 1.18 | 1.56 | 7.40 | 10.15 | 27.1 | 6.9 | 10.2 | 41.1 | 58.3 | 5,821 | 6,562 | 5,557 | 5,743 |
| 1978 | 1.19 | 1.79 | 8.05 | 11.04 | 27.0 | 7.1 | 11.8 | 46.6 | 65.6 | 5,974 | 6,604 | 5,787 | 5,940 |
| 1979 | 1.34 | 1.92 | 7.48 | 10.73 | 30.3 | 8.0 | 12.6 | 42.7 | 63.4 | 5,985 | 6,579 | 5,715 | 5,903 |
| 1980 | 1.78 | 2.09 | 9.04 | 12.91 | 30.0 | 10.1 | 13.7 | 50.1 | 73.9 | 5,684 | 6,558 | 5,540 | 5,725 |
| 1981 | 2.67 | 2.53 | 12.30 | 17.50 | 29.7 | 15.4 | 17.0 | 68.8 | 101.3 | 5,789 | 6,724 | 5,598 | 5,790 |
| 1982 | 2.47 | 2.17 | 11.35 | 15.98 | 29.0 | 13.5 | 14.8 | 60.5 | 88.8 | 5,446 | 6,819 | 5,334 | 5,553 |
| 1983 | 2.11 | 1.66 | 10.27 | 14.04 | 26.9 | 10.6 | 10.3 | 48.8 | 69.6 | 4,995 | 6,211 | 4,744 | 4,955 |
| 1984 | 2.34 | 1.60 | 11.48 | 15.42 | 25.5 | 12.5 | 10.0 | 59.2 | 81.7 | 5,354 | 6,253 | 5,151 | 5,296 |
| 1985 | 1.88 | 1.28 | 9.45 | 12.61 | 25.1 | 10.6 | 8.3 | 49.9 | 68.7 | 5,604 | 6,456 | 5,273 | 5,443 |
| 1986 | 0.99 | 0.73 | 5.51 | 7.23 | 23.8 | R6.1 | R5.2 | R30.5 | R41.8 | R6,205 | R7,064 | R5,538 | R5,783 |
| 1987 | 0.86 | 0.67 | 5.18 | 6.71 | 22.8 | R5.3 | R4.6 | R27.8 | R37.8 | R6,224 | R6,862 | R5,366 | R5,626 |
| 1988 | 0.79 | 0.66 | 4.77 | 6.22 | 23.4 | R5.0 | R4.8 | R28.4 | R38.2 | R6,297 | R7,245 | R5,952 | R6,134 |
| 1989 | 0.58 | 0.65 | 4.00 | 5.24 | 23.6 | R3.8 | R4.5 | R22.9 | R31.1 | R6,500 | R6,852 | R5,718 | R5,946 |
| 1990E | R0.63 | R0.64 | R3.86 | R5.12 | R24.8 | R4.3 | R4.5 | R22.2 | R31.0 | R6,919 | R6,945 | R5,764 | R6,053 |
| 1991E | R0.57 | R0.54 | R3.39 | R4.51 | R24.7 | R3.7 | R3.6 | R19.3 | R26.6 | R6,381 | R6,677 | R5,694 | R5,899 |
| 1992E | R0.51 | R0.42 | R2.66 | R3.59 | R25.9 | R3.3 | R2.6 | R14.2 | R20.0 | R6,497 | R6,038 | R5,335 | R5,582 |
| 1993E | R0.48 | R0.50 | R2.51 | R3.50 | R28.1 | R3.0 | R3.0 | R14.4 | R20.5 | R6,289 | R6,023 | R5,739 | R5,855 |
| 1994E | R0.60 | R0.75 | R2.20 | R3.56 | R38.0 | R4.0 | R4.8 | R13.7 | R22.5 | R6,553 | R6,450 | R6,213 | R6,320 |
| 1995E | 0.74 | 0.79 | 1.94 | 3.47 | 44.1 | 4.7 | 5.2 | 11.6 | 21.5 | 6,421 | 6,600 | 5,972 | 6,211 |

R=Revised data. E=Estimate. See Note 2 at end of section.

Notes: • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Sources: • 1949-1960—American Association of Petroleum Geologists, *Statistics on Exploratory Drilling In the United States, 1940 through 1960* (1962), pp. 4-19. • 1961-1965—*Bulletin of the American Association of Petroleum Geologists*, "North American Developments" Issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute (1970-1994) and to the Petroleum Information Corporation (1995 forward).

## Figure 4.6 Oil and Gas Development Wells, 1949-1995




Source: Table 4.6.

# Table 4.6 Oil and Gas Development Wells, 1949-1995

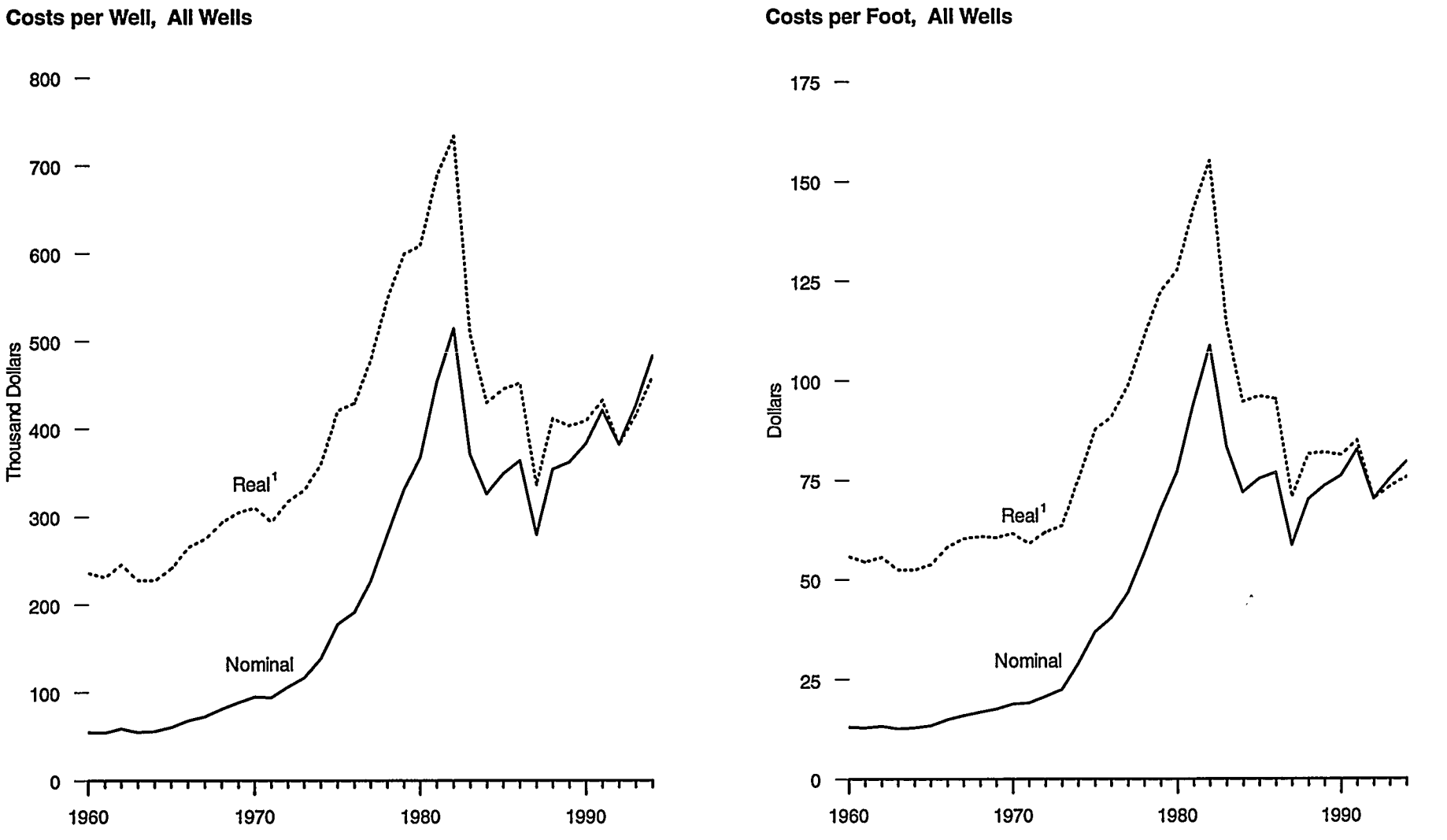
| Year | Wells Drilled (thousands) | | | | Successful Wells (percent) | Footage Drilled (million feet) | | | | Average Depth (feet per well) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oil | Gas | Dry Holes | Total | | Oil | Gas | Dry Holes | Total | Oil | Gas | Dry Holes | Total |
| 1949 | 19.95 | 2.94 | 5.37 | 28.25 | 81.0 | 73.5 | 10.0 | 17.3 | 100.8 | 3,684 | 3,412 | 3,225 | 3,568 |
| 1950 | 22.23 | 3.01 | 6.51 | 31.74 | 79.5 | 85.8 | 11.3 | 20.0 | 117.2 | 3,861 | 3,766 | 3,077 | 3,691 |
| 1951 | 21.42 | 2.98 | 7.49 | 31.89 | 76.5 | 87.0 | 11.5 | 24.4 | 122.8 | 4,061 | 3,837 | 3,255 | 3,851 |
| 1952 | 21.51 | 2.96 | 7.67 | 32.14 | 76.1 | 89.7 | 11.9 | 27.0 | 128.5 | 4,167 | 4,015 | 3,520 | 3,999 |
| 1953 | 23.34 | 3.27 | 7.82 | 34.43 | 77.3 | 92.7 | 14.3 | 26.6 | 133.6 | 3,972 | 4,373 | 3,401 | 3,880 |
| 1954 | 26.16 | 3.31 | 8.54 | 38.01 | 77.5 | 104.0 | 14.5 | 30.0 | 148.4 | 3,974 | 4,365 | 3,512 | 3,905 |
| 1955 | 28.20 | 3.39 | 8.62 | 40.21 | 78.6 | 110.4 | 14.7 | 31.9 | 157.0 | 3,915 | 4,339 | 3,699 | 3,904 |
| 1956 | 28.26 | 3.71 | 8.99 | 40.96 | 78.0 | 109.2 | 17.6 | 32.1 | 158.9 | 3,865 | 4,734 | 3,574 | 3,880 |
| 1957 | 25.42 | 3.61 | 8.25 | 37.28 | 77.9 | 100.2 | 17.9 | 29.7 | 147.9 | 3,944 | 4,950 | 3,605 | 3,966 |
| 1958 | 22.03 | 4.18 | 7.53 | 33.74 | 77.7 | 84.4 | 20.1 | 27.3 | 131.8 | 3,831 | 4,801 | 3,631 | 3,907 |
| 1959 | 22.34 | 4.02 | 8.01 | 34.37 | 76.7 | 86.1 | 20.6 | 30.8 | 137.4 | 3,852 | 5,120 | 3,844 | 3,999 |
| 1960 | 20.94 | 4.28 | 8.70 | 33.92 | 74.4 | 79.7 | 22.8 | 33.8 | 136.3 | 3,809 | 5,321 | 3,889 | 4,020 |
| 1961 | 20.28 | 4.67 | 8.31 | 33.26 | 75.0 | 79.7 | 24.0 | 31.4 | 135.2 | 3,931 | 5,145 | 3,782 | 4,064 |
| 1962 | 20.52 | 4.58 | 8.26 | 33.36 | 75.2 | 82.2 | 23.8 | 35.0 | 141.0 | 4,008 | 5,186 | 4,239 | 4,227 |
| 1963 | 18.82 | 3.91 | 8.08 | 30.80 | 73.8 | 75.4 | 20.3 | 33.5 | 129.2 | 4,006 | 5,198 | 4,143 | 4,193 |
| 1964 | 18.69 | 4.14 | 8.74 | 31.57 | 72.3 | 73.7 | 21.4 | 36.8 | 131.9 | 3,947 | 5,171 | 4,207 | 4,179 |
| 1965 | 17.12 | 3.97 | 8.22 | 29.31 | 71.9 | 68.0 | 21.2 | 36.5 | 125.7 | 3,970 | 5,337 | 4,446 | 4,288 |
| 1966 | 15.58 | 3.68 | 6.81 | 26.07 | 73.9 | 60.5 | 20.1 | 26.6 | 107.2 | 3,884 | 5,474 | 3,900 | 4,112 |
| 1967 | 14.34 | 3.13 | 5.89 | 23.36 | 74.8 | 53.0 | 17.6 | 23.0 | 93.5 | 3,692 | 5,629 | 3,901 | 4,004 |
| 1968 | 13.38 | 2.97 | 5.37 | 21.72 | 75.3 | 53.9 | 17.0 | 23.2 | 94.0 | 4,027 | 5,716 | 4,311 | 4,328 |
| 1969 | 13.28 | 3.47 | 5.74 | 22.49 | 74.5 | 55.0 | 19.2 | 25.4 | 99.6 | 4,142 | 5,531 | 4,437 | 4,431 |
| 1970 | 12.28 | 3.55 | 4.91 | 20.74 | 76.3 | 52.1 | 20.0 | 23.0 | 95.0 | 4,243 | 5,615 | 4,686 | 4,583 |
| 1971 | 11.24 | 3.51 | 4.39 | 19.14 | 77.1 | 45.3 | 19.8 | 20.2 | 85.3 | 4,028 | 5,641 | 4,608 | 4,457 |
| 1972 | 10.75 | 4.83 | 4.81 | 20.38 | 76.4 | 45.4 | 25.4 | 22.7 | 93.5 | 4,228 | 5,261 | 4,716 | 4,588 |
| 1973 | 9.60 | 5.90 | 4.43 | 19.92 | 77.8 | 40.7 | 31.1 | 21.5 | 93.4 | 4,242 | 5,281 | 4,861 | 4,687 |
| 1974 | 12.79 | 5.97 | 5.31 | 24.07 | 77.9 | 47.0 | 30.8 | 24.4 | 102.1 | 3,674 | 5,156 | 4,587 | 4,243 |
| 1975 | 15.99 | 6.91 | 6.53 | 29.42 | 77.8 | 61.1 | 36.0 | 28.9 | 126.0 | 3,822 | 5,213 | 4,423 | 4,282 |
| 1976 | 16.60 | 8.08 | 6.95 | 31.62 | 78.0 | 62.3 | 40.0 | 31.1 | 133.4 | 3,756 | 4,954 | 4,468 | 4,218 |
| 1977 | 17.52 | 10.56 | 7.63 | 35.71 | 78.6 | 68.3 | 53.3 | 35.9 | 157.4 | 3,899 | 5,044 | 4,699 | 4,409 |
| 1978 | 17.87 | 12.61 | 8.54 | 39.02 | 78.1 | 69.5 | 63.8 | 39.6 | 172.8 | 3,889 | R5,056 | 4,634 | 4,429 |
| 1979 | 19.37 | 13.25 | 8.56 | 41.18 | 79.2 | 74.1 | 67.3 | 38.9 | 180.3 | 3,828 | 5,076 | 4,549 | 4,379 |
| 1980 | 30.50 | 15.13 | 11.30 | 56.93 | 80.1 | 113.5 | 76.9 | 48.0 | 238.4 | 3,721 | 5,085 | 4,246 | 4,188 |
| 1981 | 40.18 | 17.37 | 14.99 | 72.54 | 79.3 | 154.0 | 89.5 | 64.1 | 307.5 | 3,833 | 5,149 | 4,275 | 4,240 |
| 1982 | 36.67 | 16.78 | 15.04 | 68.48 | 78.0 | 135.2 | 91.7 | 62.8 | 289.7 | 3,686 | 5,466 | 4,176 | 4,230 |
| 1983 | 35.09 | 12.90 | 14.07 | 62.05 | 77.3 | 126.1 | 67.2 | 56.1 | 249.5 | 3,594 | 5,213 | 3,992 | 4,020 |
| 1984 | 40.25 | 15.41 | 14.32 | 69.98 | 79.5 | 148.8 | 80.3 | 60.6 | 289.8 | 3,698 | 5,211 | 4,235 | 4,141 |
| 1985 | 33.14 | 12.97 | 11.76 | 57.88 | 79.7 | 127.7 | 67.6 | 51.3 | R246.6 | R3,853 | 5,213 | 4,364 | R4,262 |
| 1986 | 17.71 | 7.40 | 7.26 | 32.37 | 77.6 | 70.5 | R39.0 | R31.4 | R140.9 | R3,979 | R5,264 | R4,331 | R4,351 |
| 1987 | 15.33 | 7.08 | 6.30 | 28.71 | 78.1 | 61.8 | R37.7 | R28.1 | R127.6 | R4,030 | R5,318 | R4,460 | R4,442 |
| 1988 | 12.53 | 7.58 | 5.48 | 25.58 | 78.6 | 54.1 | R40.4 | R26.6 | R121.1 | R4,319 | R5,333 | R4,857 | R4,734 |
| 1989 | 9.76 | 8.57 | 4.49 | 22.82 | 80.3 | 40.8 | R44.4 | R21.7 | R106.9 | R4,186 | R5,181 | R4,824 | R4,685 |
| 1990E | R11.52 | R10.06 | R4.76 | R26.34 | R81.9 | 51.0 | R51.4 | R23.0 | R125.4 | R4,425 | R5,105 | R4,833 | R4,759 |
| 1991E | R11.34 | R8.91 | R4.52 | R24.77 | R81.7 | 51.6 | R46.6 | R21.6 | R119.8 | R4,555 | R5,224 | R4,781 | R4,837 |
| 1992E | R8.52 | R7.67 | R3.99 | R20.18 | R80.2 | 42.4 | R43.3 | R19.2 | R104.9 | R4,974 | R5,648 | R4,810 | R5,198 |
| 1993E | R8.25 | R9.37 | R4.21 | R21.83 | R80.7 | 42.5 | R56.5 | R20.8 | R119.9 | R5,158 | R6,037 | R4,933 | R5,492 |
| 1994E | R6.16 | R8.23 | R3.09 | R17.49 | R82.3 | 34.0 | R53.3 | R16.7 | R104.0 | R5,511 | R6,476 | R5,408 | R5,947 |
| 1995E | 5.90 | 6.44 | 2.27 | 14.61 | 84.5 | 30.4 | 41.8 | 13.2 | 85.3 | 5,151 | 6,481 | 5,796 | 5,837 |

R=Revised data. E=Estimate. See Note 2 at end of section.

Notes: • Service wells, stratigraphic tests, and core tests are excluded. • For 1949-1959, data represent wells completed in a given year. For 1960-1969, data are for well completion reports received by the American Petroleum Institute during the reporting year. For 1970 forward, the data represent wells completed in a given year. See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding. Average depth may not equal average of components due to independent rounding.

Sources: • 1949-1965—Gulf Publishing Company, *World Oil*, "Forecast-Review" issue. • 1966-1969—American Petroleum Institute, *Quarterly Review of Drilling Statistics for the United States*, annual summaries and monthly reports. • 1970 forward—Energy Information Administration computations based on well reports submitted to the American Petroleum Institute (1970-1994) and to the Petroleum Information Corporation (1995 forward).

## Figure 4.7 Costs of Wells Drilled, 1960-1994




[1]In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Source: Table 4.7.

# Table 4.7 Costs of Oil and Gas Wells Drilled, 1960-1994

| Year | Costs per Well (thousand dollars) | | | | | Costs per Foot (dollars) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Oil (nominal) | Gas (nominal) | Dry Holes (nominal) | All (nominal) | All (real) [1] | Oil (nominal) | Gas (nominal) | Dry Holes (nominal) | All (nominal) | All (real) [1] |
| 1960 | 52.2 | 102.7 | 44.0 | 54.9 | R235.8 | 13.22 | 18.57 | 10.56 | 13.01 | R55.84 |
| 1961 | 51.3 | 94.7 | 45.2 | 54.5 | R231.0 | 13.11 | 17.65 | 10.56 | 12.85 | R54.45 |
| 1962 | 54.2 | 97.1 | 50.8 | 58.6 | R245.3 | 13.41 | 18.10 | 11.20 | 13.31 | R55.69 |
| 1963 | 51.8 | 92.4 | 48.2 | 55.0 | R227.4 | 13.20 | 17.19 | 10.58 | 12.69 | R52.44 |
| 1964 | 50.6 | 104.8 | 48.5 | 55.8 | R227.8 | 13.12 | 18.57 | 10.64 | 12.86 | R52.49 |
| 1965 | 56.6 | 101.9 | 53.1 | 60.6 | R242.6 | 13.94 | 18.35 | 11.21 | 13.44 | R53.76 |
| 1966 | 62.2 | 133.8 | 56.9 | 68.4 | R266.1 | 15.04 | 21.75 | 12.34 | 14.95 | R58.17 |
| 1967 | 66.6 | 141.0 | 61.5 | 72.9 | R275.1 | 16.61 | 23.05 | 12.87 | 15.97 | R60.26 |
| 1968 | 79.1 | 148.5 | 66.2 | 81.5 | R294.1 | 18.63 | 24.05 | 12.88 | 16.83 | R60.76 |
| 1969 | 86.5 | 154.3 | 70.2 | 88.6 | R305.4 | 19.28 | 25.58 | 13.23 | 17.56 | R60.55 |
| 1970 | 86.7 | 160.7 | 80.9 | 94.9 | R310.1 | 19.29 | 26.75 | 15.21 | 18.84 | R61.57 |
| 1971 | 78.4 | 166.6 | 86.8 | 94.7 | R294.1 | 18.41 | 27.70 | 16.02 | 19.03 | R59.10 |
| 1972 | 93.5 | 157.8 | 94.9 | 106.4 | R317.7 | 20.77 | 27.78 | 17.28 | 20.76 | R61.97 |
| 1973 | 103.8 | 155.3 | 105.8 | 117.2 | R330.9 | 22.54 | 27.46 | 19.22 | 22.50 | R63.56 |
| 1974 | 110.2 | 189.2 | 141.7 | 138.7 | R360.3 | 27.82 | 34.11 | 26.76 | 28.93 | R75.14 |
| 1975 | 138.6 | 262.0 | 177.2 | 177.8 | R421.3 | 34.17 | 46.23 | 33.86 | 36.99 | R87.65 |
| 1976 | 151.1 | 270.4 | 190.3 | 191.6 | R429.6 | 37.35 | 49.78 | 36.94 | 40.46 | R90.72 |
| 1977 | 170.0 | 313.5 | 230.2 | 227.2 | R479.3 | 41.16 | 57.57 | 43.49 | 46.81 | R98.76 |
| 1978 | 208.0 | 374.2 | 281.7 | 280.0 | R548.9 | 49.72 | 68.37 | 52.55 | 56.63 | R111.04 |
| 1979 | 243.1 | 443.1 | 339.6 | 331.4 | R599.2 | 58.29 | 80.66 | 64.60 | 67.70 | R122.42 |
| 1980 | 272.1 | 536.4 | 376.5 | 367.7 | R608.7 | 66.36 | 95.16 | 73.70 | 77.02 | R127.52 |
| 1981 | 336.3 | 698.6 | 464.0 | 453.7 | R688.5 | 80.40 | 122.17 | 90.03 | 94.30 | R143.10 |
| 1982 | 347.4 | 864.3 | 515.4 | 514.4 | R733.8 | 86.34 | 146.20 | 104.09 | 108.73 | R155.11 |
| 1983 | 283.8 | 608.1 | 366.5 | 371.7 | R508.5 | 72.65 | 108.37 | 79.10 | 83.34 | R114.01 |
| 1984 | 262.1 | 489.8 | 329.2 | 326.5 | R430.1 | 66.32 | 88.80 | 67.18 | 71.90 | R94.73 |
| 1985 | 270.4 | 508.7 | 372.3 | 349.4 | R445.7 | 66.78 | 93.09 | 73.69 | 75.35 | R96.11 |
| 1986 | 284.9 | 522.9 | 389.2 | 364.6 | R452.3 | 68.35 | 93.02 | 76.53 | 76.88 | R95.38 |
| 1987 | 246.0 | 380.4 | 259.1 | 279.6 | R336.5 | 58.35 | 69.55 | 51.05 | 58.71 | R70.65 |
| 1988 | 279.4 | 460.3 | 366.4 | 354.7 | R412.0 | 62.28 | 84.65 | 66.96 | 70.23 | R81.57 |
| 1989 | 282.3 | 457.8 | 355.4 | 362.2 | R403.8 | 64.92 | 86.86 | 67.61 | 73.55 | R82.00 |
| 1990 | 321.8 | 471.3 | 367.5 | 383.6 | R409.8 | 69.17 | 90.73 | 67.49 | 76.07 | R81.27 |
| 1991 | 346.9 | 506.6 | 441.2 | 421.5 | R433.1 | 73.75 | 93.10 | 83.05 | 82.64 | R84.93 |
| 1992 | 362.3 | 426.1 | 357.6 | 382.6 | R382.6 | 69.50 | 72.83 | 67.82 | 70.27 | R70.27 |
| 1993 | 356.6 | 521.2 | 387.7 | 426.8 | R416.0 | 67.52 | 83.15 | 72.56 | 75.30 | R73.39 |
| 1994 | 409.5 | 535.1 | 491.5 | 483.2 | 460.2 | 70.57 | 81.90 | 86.60 | 79.49 | 75.70 |

[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

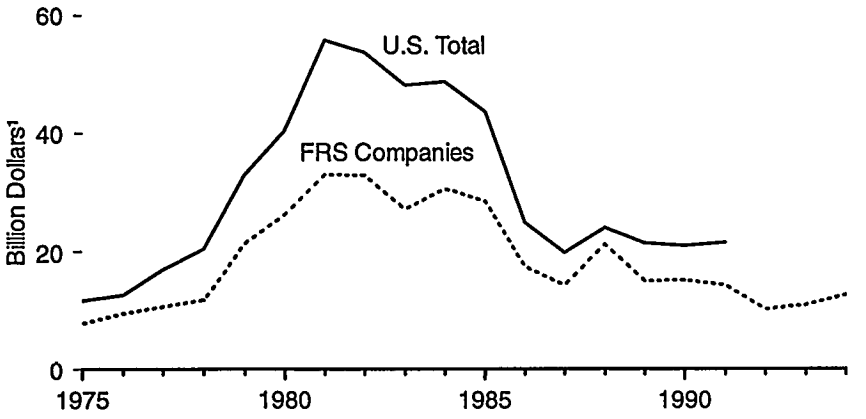
R=Revised data.

Notes: • The information reported for 1965 and prior years is not strictly comparable to that in the more recent surveys. • Average cost is the arithmetic mean and includes all costs for drilling and equipping wells and for surface-producing facilities. Wells drilled include exploratory and development wells; excludes service wells, stratigraphic tests, and core tests.

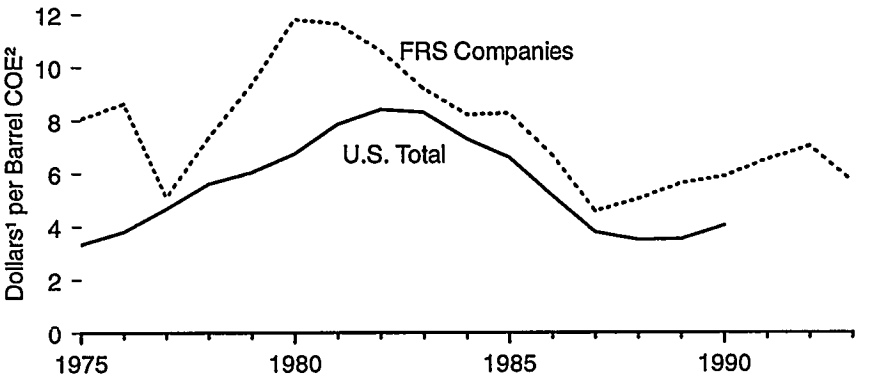
Source: American Petroleum Institute, Independent Petroleum Association of America, Mid-Continent Oil and Gas Association, *1994 Joint Association Survey on Drilling Costs.*

## Figure 4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry

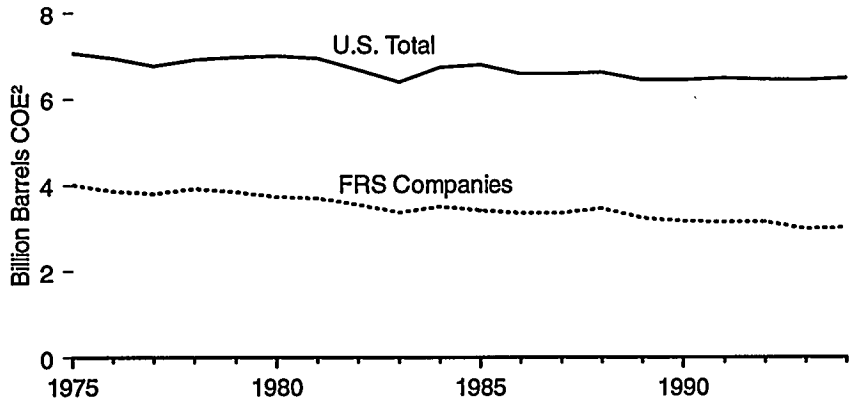
**Exploration and Development Expenditures, 1975-1994**



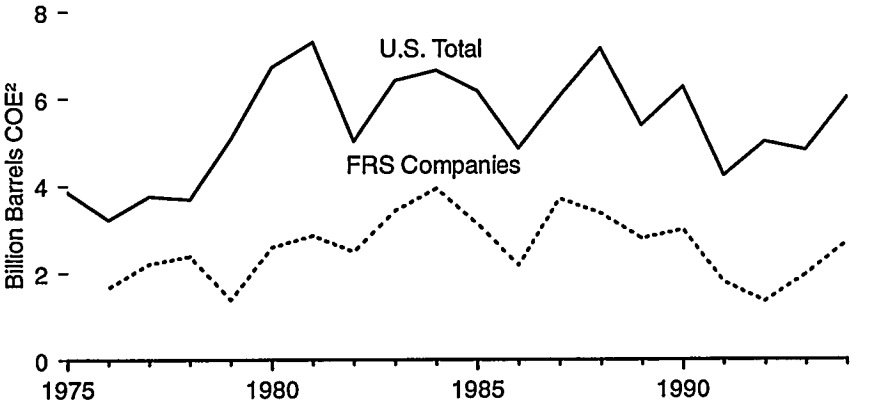

**Expenditures per Barrel of Reserve Additions, 1975-1993 (3-year weighted average)**




**Production, 1975-1994**




**Gross Additions to Proved Reserves, 1975-1994**




[1] Nominal dollars.
[2] COE=crude oil equivalent.
Note: FRS is the Financial Reporting System (see Table 3.14).

Source: Table 4.8.

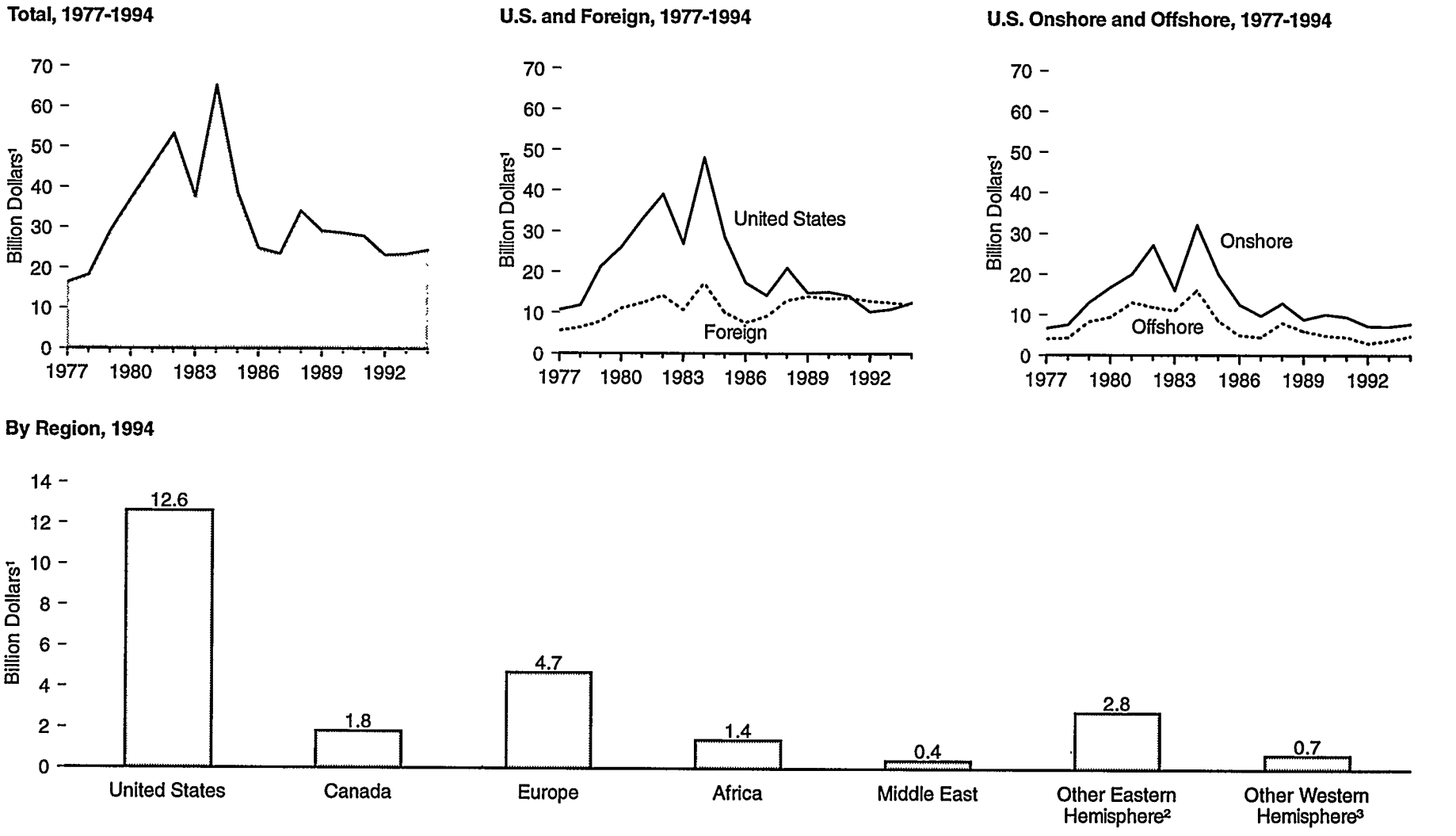
# Table 4.8 U.S. Exploration and Development Expenditures, Gross Additions to Proved Reserves, and Production of Liquid and Gaseous Hydrocarbons by FRS Companies and U.S. Industry, 1975-1994

| Year | Exploration and Development Expenditures (billion dollars[3]) | | Gross Additions to Proved Reserves [1] of Liquid and Gaseous Hydrocarbons [2] (million barrels COE [4]) | | Expenditures per Barrel of Reserve Additions, Three-Year Weighted Average (dollars[3] per barrel COE [4]) | | Production of Liquid and Gaseous Hydrocarbons [2] (million barrels COE [4]) | |
|---|---|---|---|---|---|---|---|---|
| | FRS Companies [5] | U.S. Total | FRS Companies [6,7] | U.S. Total [7] | FRS Companies [5,6] | U.S. Total | FRS Companies [6] | U.S. Total |
| 1975 | 7.8 | 11.7 | NA | 3,846 | 8.05 | 3.34 | 4,006 | 7,071 |
| 1976 | 9.5 | 12.6 | 1,663 | 3,224 | 8.64 | 3.81 | 3,863 | 6,958 |
| 1977 | 10.7 | 17.0 | 2,210 | 3,765 | 5.12 | 4.68 | 3,809 | 6,777 |
| 1978 | 11.8 | 20.4 | 2,383 | 3,679 | 7.34 | 5.62 | 3,916 | 6,918 |
| 1979 | 21.3 | 32.9 | 1,378 | 5,071 | 9.34 | 6.06 | 3,834 | 6,970 |
| 1980 | 26.2 | 40.4 | 2,590 | 6,723 | 11.80 | 6.76 | 3,727 | 6,995 |
| 1981 | 33.0 | 55.7 | 2,848 | 7,304 | 11.63 | 7.86 | 3,694 | 6,954 |
| 1982 | 32.9 | 53.7 | 2,482 | 5,030 | 10.62 | 8.41 | 3,551 | 6,682 |
| 1983 | 27.1 | 48.2 | 3,427 | 6,412 | 9.20 | 8.32 | 3,370 | 6,399 |
| 1984 | 30.6 | 48.7 | 3,941 | 6,653 | 8.21 | 7.30 | 3,503 | 6,736 |
| 1985 | 28.5 | 43.6 | 3,129 | 6,190 | 8.27 | 6.61 | 3,427 | 6,798 |
| 1986 | 17.4 | 24.9 | R2,178 | 4,866 | 6.67 | 5.16 | 3,361 | 6,602 |
| 1987 | 14.2 | 19.8 | 3,698 | 6,059 | 4.58 | 3.79 | 3,354 | 6,596 |
| 1988 | 21.2 | 24.0 | 3,359 | 7,156 | 5.05 | 3.50 | 3,460 | 6,627 |
| 1989 | 15.0 | 21.4 | 2,798 | 5,385 | 5.62 | 3.52 | 3,243 | 6,446 |
| 1990 | 15.1 | 21.0 | 2,979 | 6,271 | 5.87 | 4.02 | 3,163 | 6,453 |
| 1991 | 14.2 | 21.5 | 1,772 | 4,227 | 6.52 | NA | 3,155 | 6,497 |
| 1992 | 10.3 | NA | 1,332 | 5,006 | 7.02 | NA | 3,152 | 6,459 |
| 1993 | 10.9 | NA | 1,945 | 4,814 | R5.66 | NA | 2,994 | R6,446 |
| 1994 | 12.6 | NA | 2,703 | 6,021 | NA | NA | 3,018 | 6,492 |

[1] Gross additions to proved reserves equal annual change in proved reserves plus annual production.
[2] Liquid and gaseous hydrocarbons include crude oil, natural gas liquids, and natural gas.
[3] Nominal dollars.
[4] Crude oil equivalent: converted to Btu on the basis of annual average conversion factors. See Appendix A.
[5] FRS data for 1982 and 1984 are adjusted to exclude purchases of proved reserves associated with mergers among the FRS companies.
[6] Based on net ownership interest (see Glossary).
[7] Downward revisions of Alaska North Slope natural gas reserves are excluded.
NA=Not available.
Notes: • FRS is the Financial Reporting System (see Table 3.14). • Data in this table are for U.S. domestic operations only.

Sources: **FRS Companies:** Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System." **U.S. Total, Exploration and Development Expenditures:** • 1975-1982—Bureau of the Census, *Annual Survey of Oil and Gas.* • 1983-1991—American Petroleum Institute, *Survey on Oil and Gas Expenditures 1992.* **U.S. Total, Gross Additions to Proved Reserves of Liquid and Gaseous Hydrocarbons:** • 1975-1979—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly), *Reserves of Crude Oil, Natural Gas Liquids, and Natural Gas in the United States and Canada as of December 31, 1979,* Volume 34, June 1980. • 1980 forward—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1994 Annual Report (November 1995).* **U.S. Total, Production of Liquid and Gaseous Hydrocarbons:** • 1975-1993—Tables 5.1 and 6.1. • 1994—EIA, *Monthly Energy Review* (February 1996).

# Figure 4.9 FRS Companies' Expenditures for Oil and Gas Exploration and Development by Region




[1] Nominal dollars.

[2] This region includes areas eastward of the Greenwich prime meridian to 180° longitude and not included in other specific domestic or foreign classifications.

[3] This region includes areas westward of the Greenwich prime meridian to 180° longitude and not included in other specific domestic or foreign classifications.

Notes: • FRS is the Financial Reporting System (see Table 3.14). • Because vertical scales differ, graphs should not be compared.

Source: Table 4.9.

# Table 4.9 FRS Companies' Expenditures for Oil and Gas Exploration and Development by Region, 1977-1994

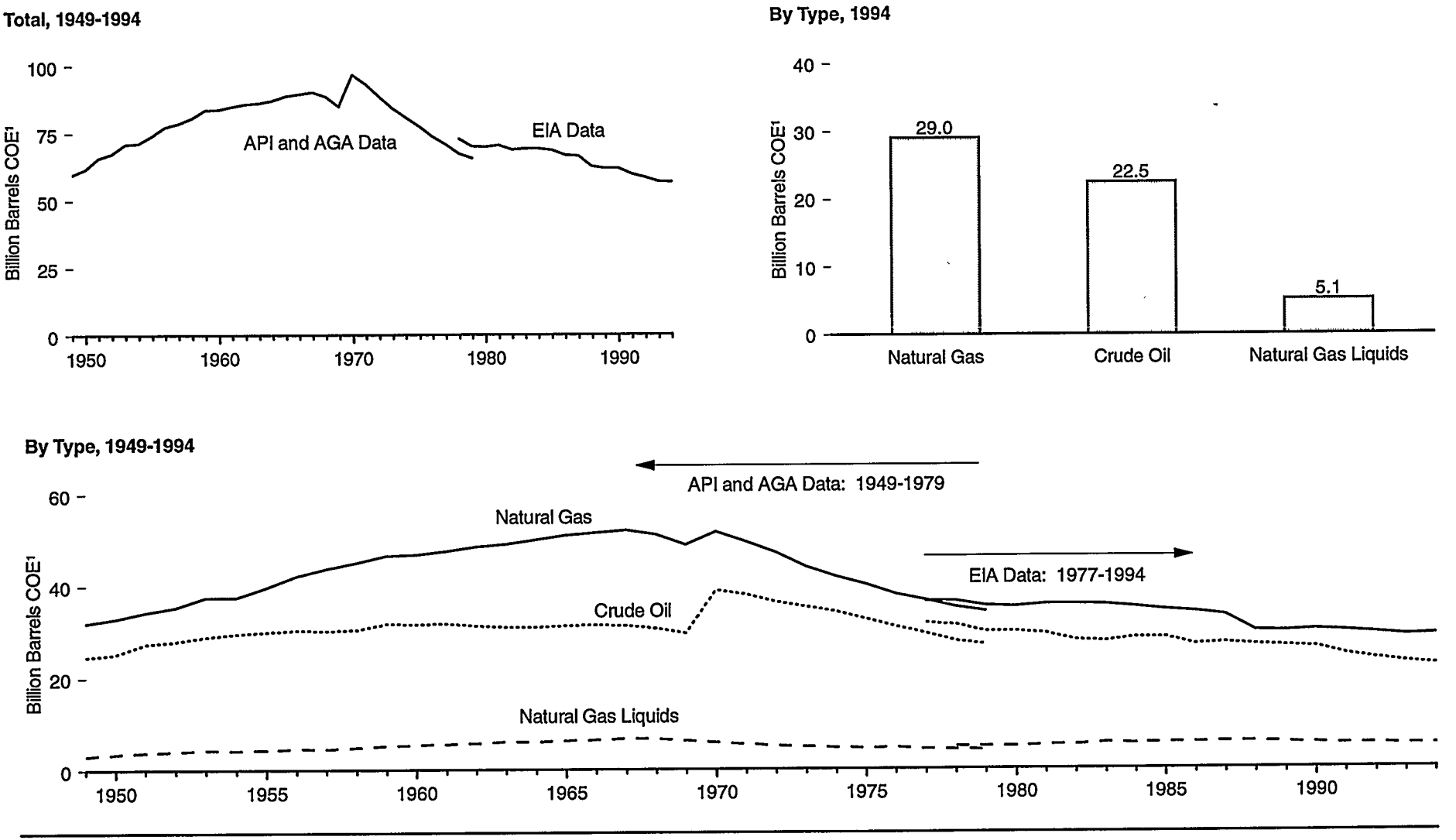
(Billion Dollars[1])

| Year | United States | | | Foreign | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Onshore | Offshore | Total | Canada | Europe | Africa | Middle East | Other Eastern Hemisphere[2] | Other Western Hemisphere[3] | Total | |
| 1977 | 6.7 | 4.0 | 10.7 | 1.5 | 2.5 | 0.7 | 0.2 | 0.3 | 0.4 | 5.6 | 16.3 |
| 1978 | 7.5 | 4.3 | 11.8 | 1.6 | 2.6 | 0.8 | 0.3 | 0.4 | 0.6 | 6.4 | 18.2 |
| 1979 | 13.0 | 8.3 | 21.3 | 2.3 | 3.0 | 0.8 | 0.2 | 0.5 | 0.8 | 7.8 | 29.1 |
| 1980 | 16.8 | 9.4 | 26.2 | 3.1 | 4.3 | 1.4 | 0.2 | 0.8 | 1.0 | 11.0 | 37.2 |
| 1981 | 19.9 | 13.0 | 33.0 | 1.8 | 5.0 | 2.1 | 0.3 | 1.9 | 1.3 | 12.4 | 45.4 |
| 1982 | 27.2 | 11.9 | 39.1 | 1.9 | 6.3 | 2.1 | 0.4 | 2.4 | 1.1 | 14.2 | 53.3 |
| 1983 | 16.0 | 11.1 | 27.1 | 1.6 | 4.3 | 1.7 | 0.5 | 2.0 | 0.6 | 10.7 | 37.7 |
| 1984 | 32.1 | 16.0 | 48.1 | 5.4 | 5.5 | 3.4 | 0.5 | 2.0 | 0.5 | 17.3 | 65.3 |
| 1985 | 20.0 | 8.5 | 28.5 | 1.9 | 3.7 | 1.6 | 0.9 | 1.3 | 0.7 | 10.1 | 38.6 |
| 1986 | 12.5 | 4.9 | 17.4 | 1.1 | 3.2 | 1.1 | 0.3 | 1.2 | 0.6 | 7.5 | 24.9 |
| 1987 | 9.7 | 4.5 | 14.3 | 1.9 | 3.0 | 0.8 | 0.4 | 2.8 | 0.5 | 9.2 | 23.5 |
| 1988 | 12.9 | 8.1 | 21.0 | 5.4 | 4.3 | 0.8 | 0.4 | 1.4 | 0.7 | 13.0 | 34.1 |
| 1989 | 9.0 | 6.0 | 15.0 | 6.3 | 3.5 | 1.0 | 0.4 | 2.3 | 0.6 | 14.1 | 29.1 |
| 1990 | 10.2 | 4.9 | 15.1 | 1.8 | 6.6 | 1.4 | 0.6 | 2.4 | 0.7 | 13.6 | 28.7 |
| 1991 | 9.6 | 4.6 | 14.2 | 1.7 | 6.8 | 1.5 | 0.5 | 2.4 | 0.7 | 13.7 | 27.9 |
| 1992 | 7.3 | 3.0 | 10.3 | 1.1 | 6.8 | 1.4 | 0.6 | 2.4 | 0.6 | 12.9 | 23.2 |
| 1993 | 7.2 | 3.7 | 10.9 | 1.6 | 5.7 | 1.5 | 0.7 | 2.5 | 0.6 | 12.5 | 23.5 |
| 1994 | 7.8 | 4.8 | 12.6 | 1.8 | 4.7 | 1.4 | 0.4 | 2.8 | 0.7 | 11.9 | 24.5 |

[1] Nominal dollars.
[2] This region includes areas eastward of the Greenwich prime meridian to 180° longitude and not included in other specified domestic or foreign classifications.
[3] This region includes areas westward of the Greenwich prime meridian to 180° longitude not included in other domestic or foreign classifications.

Note: FRS is the Financial Reporting System (see Table 3.14).
Sources: • **1977-1991**—Energy Information Administration (EIA), Form EIA-28, "Financial Reporting System." • **1992**—EIA, *Performance Profiles of Major Energy Producers, 1993*, Table 13. • **1993-1994**—EIA, *Performance Profiles of Major Energy Producers, 1994*, Table 13.

# Figure 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year




[1] COE=crude oil equivalent.

Notes: • API=American Petroleum Institute. AGA=American Gas Association. EIA=Energy Information Administration. • Because vertical scales differ, graphs should not be compared.

Source: Table 4.10.

# Table 4.10 Liquid and Gaseous Hydrocarbon Proved Reserves, End of Year 1949-1994

| Year | Crude Oil | Natural Gas | | Natural Gas Liquids | | Total |
|---|---|---|---|---|---|---|
| | Billion Barrels | Trillion Cubic Feet [1] | Billion Barrels COE [2] | Billion Barrels | Billion Barrels COE [2] | Billion Barrels COE [2] |
| | American Petroleum Institute and American Gas Association Data | | | | | |
| 1949 | 24.6 | 179.4 | 32.0 | 3.7 | 3.1 | 59.7 |
| 1950 | 25.3 | 184.6 | 32.9 | 4.3 | 3.5 | 61.7 |
| 1951 | 27.5 | 192.8 | 34.4 | 4.7 | 3.9 | 65.7 |
| 1952 | 28.0 | 198.6 | 35.4 | 5.0 | 4.1 | 67.5 |
| 1953 | 28.9 | 210.3 | 37.5 | 5.4 | 4.4 | 70.9 |
| 1954 | 29.6 | 210.6 | 37.6 | 5.2 | 4.2 | 71.3 |
| 1955 | 30.0 | 222.5 | 39.7 | 5.4 | 4.4 | 74.1 |
| 1956 | 30.4 | 236.5 | 42.2 | 5.9 | 4.7 | 77.3 |
| 1957 | 30.3 | 245.2 | 43.8 | 5.7 | 4.5 | 78.6 |
| 1958 | 30.5 | 252.8 | 45.1 | 6.2 | 5.0 | 80.6 |
| 1959 | 31.7 | 261.2 | 46.6 | 6.5 | 5.2 | 83.5 |
| 1960 | 31.6 | 262.3 | 46.8 | 6.8 | 5.4 | 83.8 |
| 1961 | 31.8 | 266.3 | 47.5 | 7.0 | 5.6 | 84.8 |
| 1962 | 31.4 | 272.3 | 48.6 | 7.3 | 5.8 | 85.7 |
| 1963 | 31.0 | 276.2 | 49.1 | 7.7 | 6.0 | 86.1 |
| 1964 | 31.0 | 281.3 | 50.0 | 7.7 | 6.1 | 87.1 |
| 1965 | 31.4 | 286.5 | 51.0 | 8.0 | 6.3 | 88.6 |
| 1966 | 31.5 | 289.3 | 51.5 | 8.3 | 6.5 | 89.5 |
| 1967 | 31.4 | 292.9 | 52.1 | 8.6 | 6.7 | 90.2 |
| 1968 | 30.7 | 287.3 | 51.1 | 8.6 | 6.7 | 88.5 |
| 1969 | 29.6 | 275.1 | 48.9 | 8.1 | 6.3 | 84.8 |
| 1970 | 39.0 | 290.7 | 51.7 | 7.7 | 5.9 | 96.6 |
| 1971 | 38.1 | 278.8 | 49.6 | 7.3 | 5.5 | 93.2 |
| 1972 | 36.3 | 266.1 | 47.1 | 6.8 | 5.1 | 88.5 |
| 1973 | 35.3 | 250.0 | 44.0 | 6.5 | 4.8 | 84.1 |
| 1974 | 34.2 | 237.1 | 41.9 | 6.4 | 4.7 | 80.8 |
| 1975 | 32.7 | 228.2 | 40.2 | 6.3 | 4.6 | 77.5 |
| 1976 | 30.9 | 216.0 | 38.0 | 6.4 | 4.7 | 73.6 |
| 1977 | 29.5 | 208.9 | 36.8 | 6.0 | 4.4 | 70.6 |
| 1978 | 27.8 | 200.3 | 35.2 | 5.9 | 4.3 | 67.3 |
| 1979 | 27.1 | 194.9 | 34.3 | 5.7 | 4.1 | 65.5 |
| | Energy Information Administration Data | | | | | |
| 1977 | 31.8 | 207.4 | 36.5 | NA | NA | NA |
| 1978 | 31.4 | 208.0 | 36.5 | 6.8 | 4.9 | 72.8 |
| 1979 | 29.8 | 201.0 | 35.4 | 6.6 | 4.8 | 70.0 |
| 1980 | 29.8 | 199.0 | 35.2 | 6.7 | 4.9 | 69.9 |
| 1981 | 29.4 | 201.7 | 35.7 | 7.1 | 5.2 | 70.3 |
| 1982 | 27.9 | 201.5 | 35.7 | 7.2 | 5.2 | 68.8 |
| 1983 | 27.7 | 200.2 | 35.6 | 7.9 | 5.7 | 69.0 |
| 1984 | 28.4 | 197.5 | 35.1 | 7.6 | 5.5 | 69.0 |
| 1985 | 28.4 | 193.4 | 34.4 | 7.9 | 5.6 | 68.5 |
| 1986 | 26.9 | 191.6 | 34.0 | 8.2 | 5.7 | 66.6 |
| 1987 | 27.3 | 187.2 | 33.3 | 8.1 | 5.8 | 66.3 |
| 1988 | 26.8 | 168.0 | 29.8 | 8.2 | 5.8 | 62.5 |
| 1989 | 26.5 | 167.1 | 29.7 | 7.8 | 5.5 | 61.7 |
| 1990 | 26.3 | 169.3 | 30.1 | 7.6 | 5.4 | 61.7 |
| 1991 | 24.7 | 167.1 | 29.7 | 7.5 | 5.3 | 59.6 |
| 1992 | 23.7 | 165.0 | 29.3 | 7.5 | 5.2 | 58.3 |
| 1993 | 23.0 | 162.4 | 28.8 | 7.2 | 5.1 | 56.8 |
| 1994 | 22.5 | 163.8 | 29.0 | 7.2 | 5.1 | 56.6 |

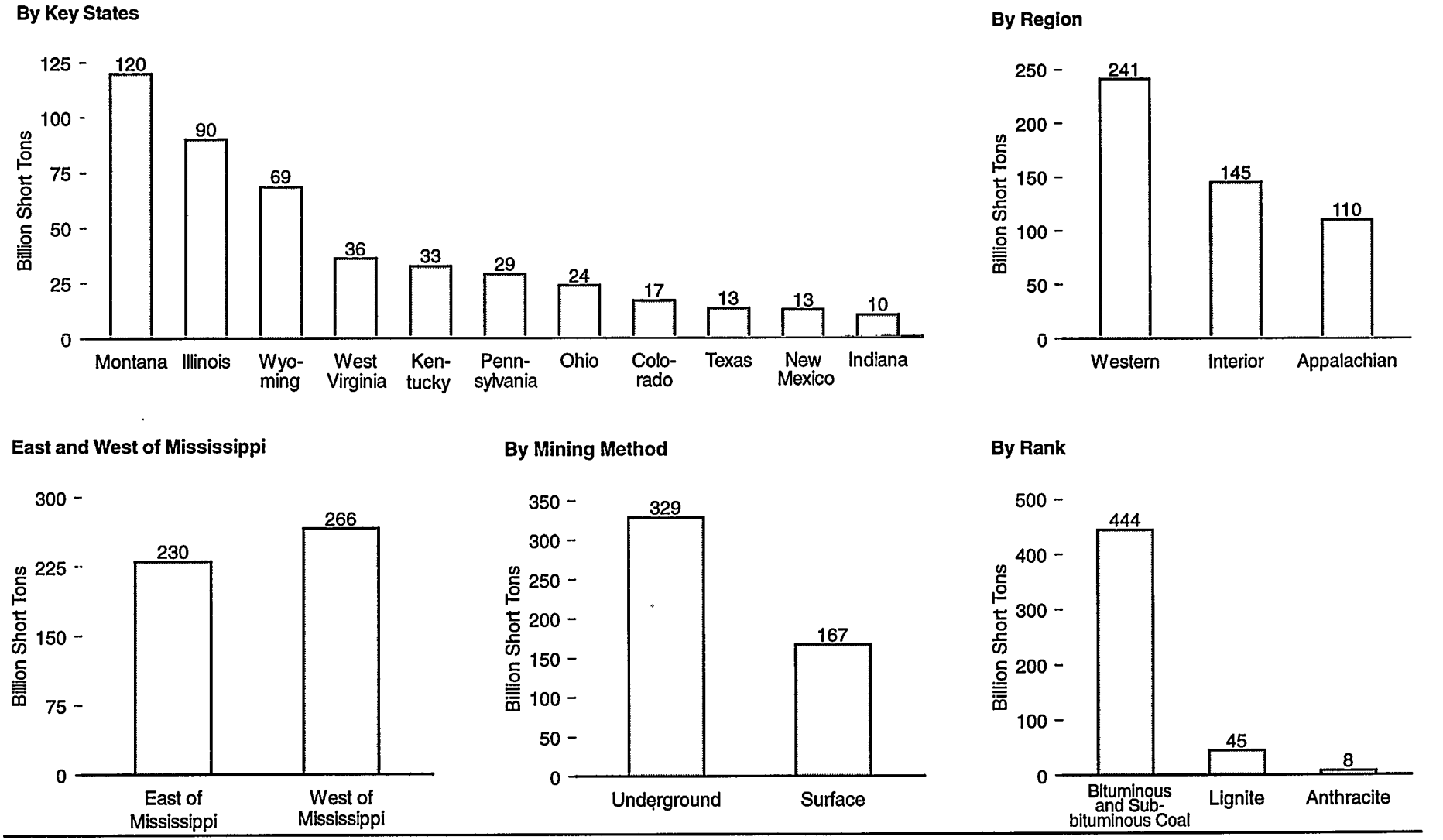
[1] The American Gas Association estimates of natural gas proved reserves include volumes of gas held in underground storage. In 1979, this volume amounted to 4.9 trillion cubic feet. Energy Information Administration (EIA) data do not include gas in underground storage.

[2] Crude oil equivalent. Natural gas and natural gas liquids are converted to Btu on the basis of annual average conversion factors. See Appendix A.

NA=Not available.

Sources: • **API/AGA Data**—American Gas Association, American Petroleum Institute, and Canadian Petroleum Association (published jointly). *Reserves of Crude Oil, Natural Gas Liquids and Natural Gas in the United States and Canada as of December 31, 1979.* Volume 34, June 1980. • **EIA Data**—EIA, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1994 Annual Report* (October 1995), Table 1.

## Figure 4.11 Coal Demonstrated Reserve Base, January 1, 1995




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 4.11.

# Table 4.11 Coal Demonstrated Reserve Base, January 1, 1995

(Billion Short Tons)

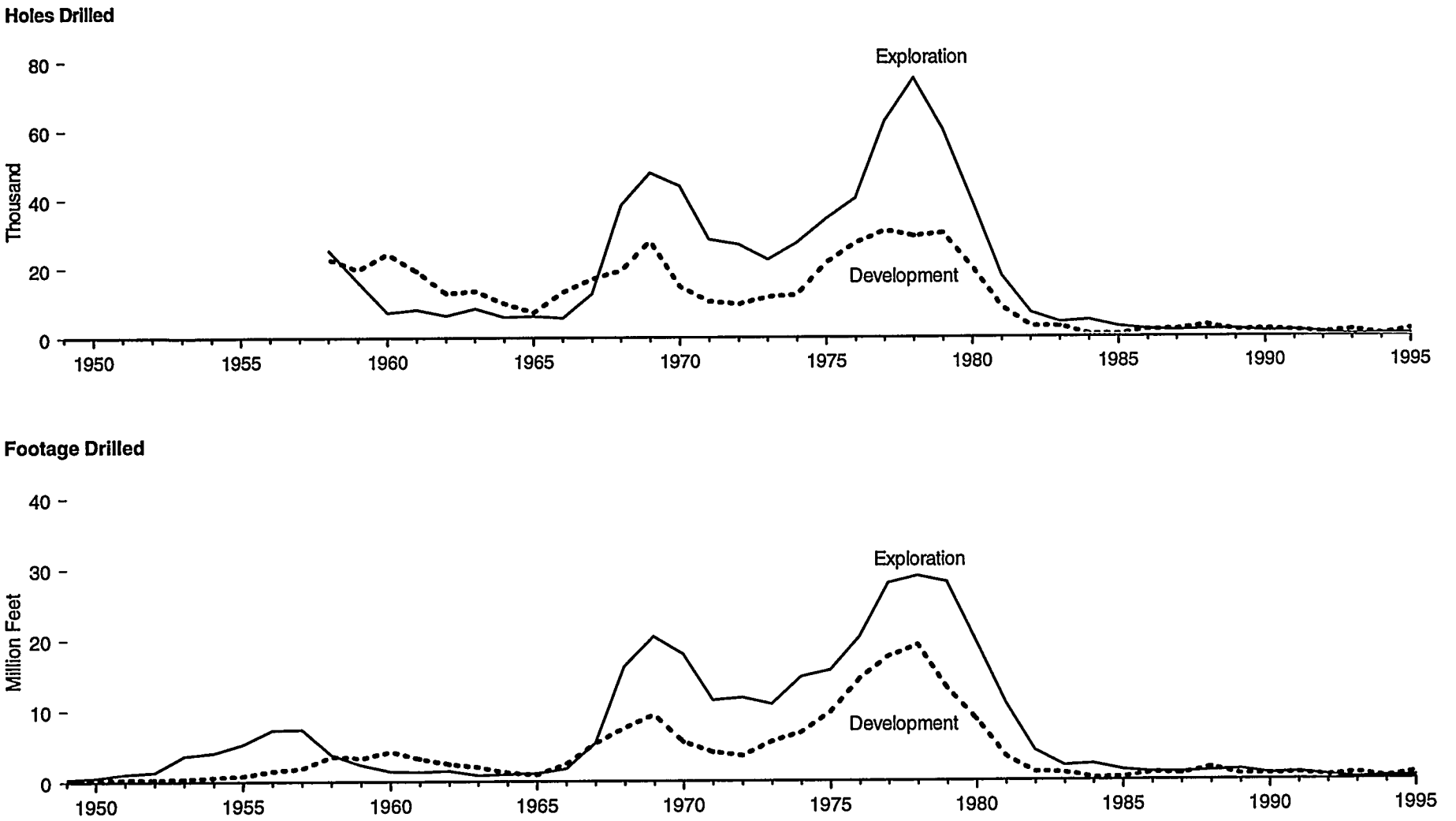
| Region and State | Anthracite | Bituminous Coal [1] | | Lignite | Total | | |
|---|---|---|---|---|---|---|---|
| | Underground and Surface [2] | Underground | Surface | Surface [3] | Underground | Surface | Total |
| **Appalachian** | **7.4** | **76.4** | **24.8** | **1.1** | **80.4** | **29.2** | **109.6** |
| Alabama | 0 | 1.4 | 2.2 | 1.1 | 1.4 | 3.3 | 4.6 |
| Kentucky, Eastern | 0 | 2.5 | 10.0 | 0 | 2.5 | 10.0 | 12.5 |
| Ohio | 0 | 17.8 | 5.9 | 0 | 17.8 | 5.9 | 23.8 |
| Pennsylvania | 7.2 | 20.6 | 1.1 | 0 | 24.4 | 4.5 | 28.9 |
| Virginia | 0.1 | 1.5 | 0.7 | 0 | 1.6 | 0.7 | 2.3 |
| West Virginia | 0 | 31.4 | 4.6 | 0 | 31.4 | 4.6 | 36.0 |
| Other [4] | 0 | 1.2 | 0.4 | 0 | 1.2 | 0.4 | 1.6 |
| **Interior** | **0.1** | **103.8** | **27.4** | **13.6** | **103.9** | **41.0** | **144.8** |
| Illinois | 0 | 73.8 | 16.2 | 0 | 73.8 | 16.2 | 90.0 |
| Indiana | 0 | 8.9 | 1.1 | 0 | 8.9 | 1.1 | 10.0 |
| Iowa | 0 | 1.7 | 0.5 | 0 | 1.7 | 0.5 | 2.2 |
| Kentucky, Western | 0 | 16.4 | 3.7 | 0 | 16.4 | 3.7 | 20.1 |
| Missouri | 0 | 1.5 | 4.5 | 0 | 1.5 | 4.5 | 6.0 |
| Oklahoma | 0 | 1.2 | 0.3 | 0 | 1.2 | 0.3 | 1.6 |
| Texas | 0 | 0 | 0 | 13.1 | 0 | 13.1 | 13.1 |
| Other [5] | 0.1 | 0.3 | 1.1 | 0.5 | 0.4 | 1.6 | 2.0 |
| **Western** | **(s)** | **144.3** | **67.1** | **29.8** | **144.3** | **96.9** | **241.2** |
| Alaska | 0 | 5.4 | 0.7 | (s) | 5.4 | 0.7 | 6.1 |
| Colorado | (s) | 12.0 | 0.6 | 4.2 | 12.0 | 4.8 | 16.8 |
| Montana | 0 | 71.0 | 33.1 | 15.8 | 71.0 | 48.8 | 119.8 |
| New Mexico | (s) | 6.2 | 6.3 | 0 | 6.2 | 6.3 | 12.5 |
| North Dakota | 0 | 0 | 0 | 9.5 | 0 | 9.5 | 9.5 |
| Utah | 0 | 5.7 | 0.3 | 0 | 5.7 | 0.3 | 6.0 |
| Washington | 0 | 1.3 | 0.1 | (s) | 1.3 | 0.1 | 1.4 |
| Wyoming | 0 | 42.5 | 26.0 | 0 | 42.5 | 26.0 | 68.5 |
| Other [6] | 0 | 0.1 | 0.1 | 0.4 | 0.1 | 0.5 | 0.6 |
| **U.S. Total** | **7.5** | **324.5** | **119.3** | **44.5** | **328.6** | **167.1** | **495.7** |
| States East of the Mississippi River | 7.4 | 175.6 | 45.8 | 1.1 | 179.5 | 50.3 | 229.8 |
| States West of the Mississippi River | 0.1 | 148.9 | 73.5 | 43.4 | 149.0 | 116.9 | 265.9 |

[1] Includes subbituminous coal.
[2] Includes 3,390.4 million short tons of surface-minable resources, of which 3,374.8 million tons are in Pennsylvania and 15.5 million tons are in Arkansas.
[3] Lignite resources are not mined underground in the United States.
[4] Georgia, Maryland, North Carolina, and Tennessee.
[5] Arkansas, Kansas, Louisiana, and Michigan.
[6] Arizona, Idaho, Oregon, and South Dakota.
(s)=Less than 0.05 billion short tons.

Notes: • Data represent known measured and indicated coal resources meeting minimum seam and depth criteria, in the ground as of January 1, 1995. These coal resources are not totally recoverable. Net recoverability ranges from less than 40 percent to more than 90 percent. Fifty-five percent of the demonstrated reserve base of coal in the United States is estimated to be recoverable. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternate Energy, previously unpublished data.

## Figure 4.12 Uranium Exploration and Development Drilling, 1949-1995




Source: Table 4.12.

# Table 4.12 Uranium Exploration and Development Drilling, 1949-1995

| Year | Exploration [1] | | Development [2] | | Total | |
|---|---|---|---|---|---|---|
| | Holes Drilled (thousands) | Footage Drilled (million feet) | Holes Drilled (thousands) | Footage Drilled (million feet) | Holes Drilled (thousands) | Footage Drilled (million feet) |
| 1949 | NA | 0.36 | NA | 0.05 | NA | 0.41 |
| 1950 | NA | 0.57 | NA | 0.21 | NA | 0.78 |
| 1951 | NA | 1.08 | NA | 0.35 | NA | 1.43 |
| 1952 | NA | 1.36 | NA | 0.30 | NA | 1.66 |
| 1953 | NA | 3.65 | NA | 0.37 | NA | 4.02 |
| 1954 | NA | 4.06 | NA | 0.55 | NA | 4.61 |
| 1955 | NA | 5.27 | NA | 0.76 | NA | 6.03 |
| 1956 | NA | 7.29 | NA | 1.50 | NA | 8.79 |
| 1957 | NA | 7.35 | NA | 1.85 | NA | 9.20 |
| 1958 | 25.32 | 3.76 | 22.93 | 3.49 | 48.25 | 7.25 |
| 1959 | 16.25 | 2.37 | 19.59 | 3.28 | 35.84 | 5.65 |
| 1960 | 7.34 | 1.40 | 24.40 | 4.21 | 31.73 | 5.61 |
| 1961 | 8.26 | 1.32 | 19.31 | 3.19 | 27.57 | 4.51 |
| 1962 | 6.44 | 1.48 | 12.87 | 2.43 | 19.31 | 3.91 |
| 1963 | 8.47 | 0.88 | 13.53 | 1.98 | 22.01 | 2.86 |
| 1964 | 5.97 | 0.97 | 9.91 | 1.25 | 15.88 | 2.21 |
| 1965 | 6.23 | 1.16 | 7.33 | 0.95 | 13.56 | 2.11 |
| 1966 | 5.75 | 1.80 | 13.18 | 2.40 | 18.93 | 4.20 |
| 1967 | 12.79 | 5.44 | 16.95 | 5.33 | 29.74 | 10.76 |
| 1968 | 38.47 | 16.23 | 19.53 | 7.53 | 58.00 | 23.75 |
| 1969 | 47.85 | 20.47 | 28.01 | 9.39 | 75.86 | 29.86 |
| 1970 | 43.98 | 17.98 | 14.87 | 5.55 | 58.85 | 23.53 |
| 1971 | 28.42 | 11.40 | 10.44 | 4.05 | 38.86 | 15.45 |
| 1972 | 26.91 | 11.82 | 9.71 | 3.61 | 36.62 | 15.42 |
| 1973 | 22.56 | 10.83 | 11.70 | 5.59 | 34.26 | 16.42 |
| 1974 | 27.40 | 14.72 | 12.30 | 6.84 | 39.70 | 21.56 |
| 1975 | 34.29 | 15.69 | 21.60 | 9.73 | 55.89 | 25.42 |
| 1976 | 40.41 | 20.36 | 27.23 | 14.44 | 67.64 | 34.80 |
| 1977 | 62.60 | 27.96 | 30.86 | 17.62 | 93.45 | 45.58 |
| 1978 | 75.07 | 28.95 | 29.29 | 19.15 | 104.35 | 48.10 |
| 1979 | 60.46 | 28.07 | 30.19 | 13.01 | 90.65 | 41.08 |
| 1980 | 39.61 | 19.60 | 20.19 | 8.59 | 59.80 | 28.19 |
| 1981 | 17.75 | 10.87 | 8.67 | 3.35 | 26.42 | 14.22 |
| 1982 | 6.97 | 4.23 | 3.00 | 1.13 | 9.97 | 5.36 |
| 1983 | 4.29 | 2.09 | 3.01 | 1.08 | 7.30 | 3.17 |
| 1984 | 4.80 | 2.26 | 0.72 | 0.29 | 5.52 | 2.55 |
| 1985 | 2.88 | 1.42 | 0.77 | 0.34 | 3.65 | 1.76 |
| 1986 | 1.99 | 1.10 | 1.85 | 0.97 | 3.83 | 2.07 |
| 1987 | 1.82 | 1.11 | 1.99 | 0.86 | 3.81 | 1.96 |
| 1988 | 2.03 | 1.28 | 3.18 | 1.73 | 5.21 | 3.01 |
| 1989 | 2.09 | 1.43 | 1.75 | 0.80 | 3.84 | 2.22 |
| 1990 | 1.51 | 0.87 | 1.91 | 0.81 | 3.42 | 1.68 |
| 1991 | 1.62 | 0.97 | 1.57 | 0.87 | 3.20 | 1.84 |
| 1992 | 0.94 | 0.56 | 0.83 | 0.50 | 1.77 | 1.06 |
| 1993 | 0.36 | 0.22 | 1.67 | 0.89 | 2.02 | 1.11 |
| 1994 | 0.52 | 0.34 | 0.48 | 0.32 | 1.00 | 0.66 |
| 1995 | 0.58 | 0.40 | 1.73 | 0.95 | 2.31 | 1.35 |

[1] Includes surface drilling in search of new ore deposits or extensions of known deposits and drilling at the location of a discovery up to the time the company decides sufficient ore reserves are present to justify commercial exploitation.

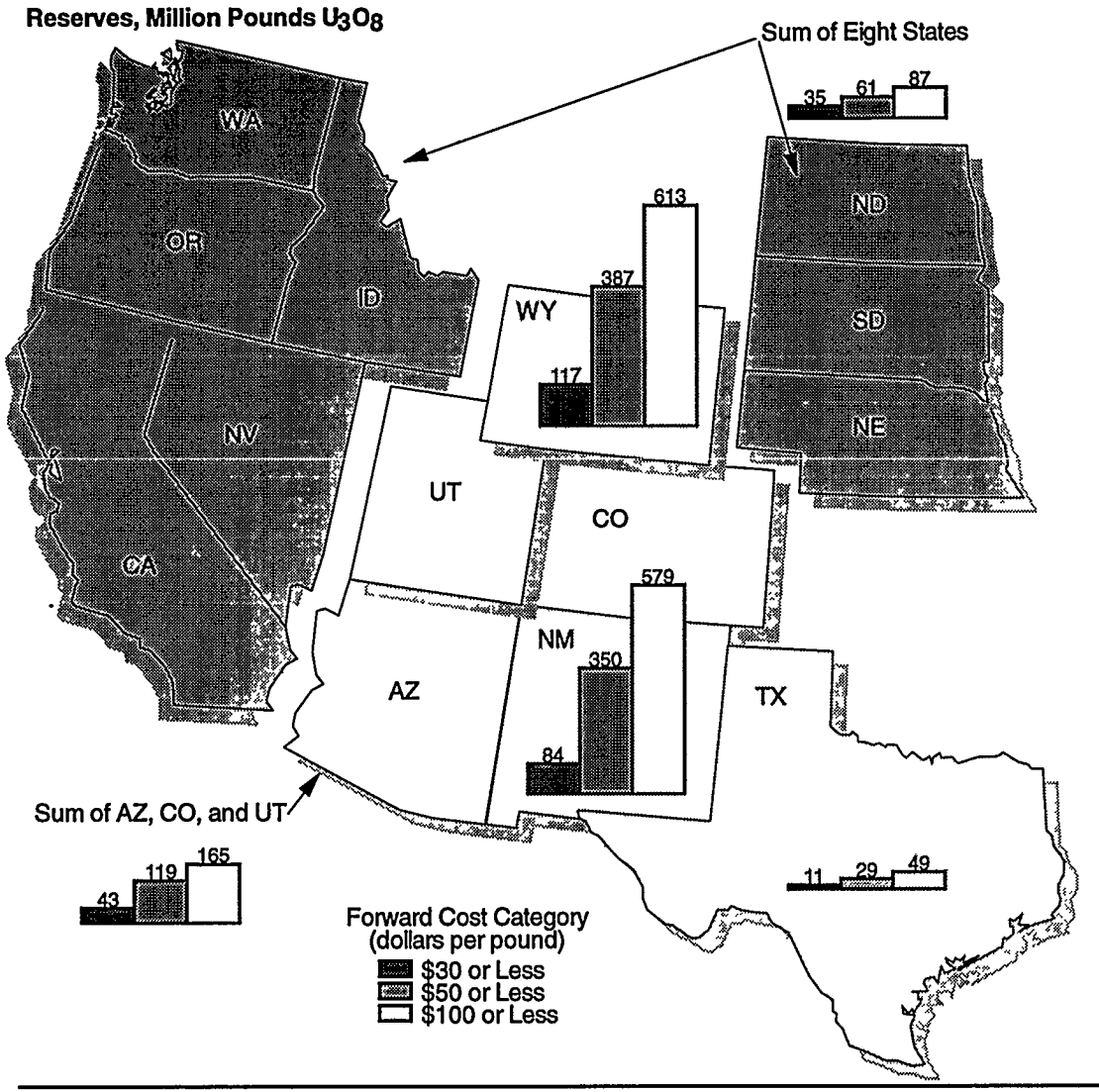
[2] Includes all surface drilling on an ore deposit to determine more precisely size, grade, and configuration subsequent to the time that commercial exploitation is deemed feasible.

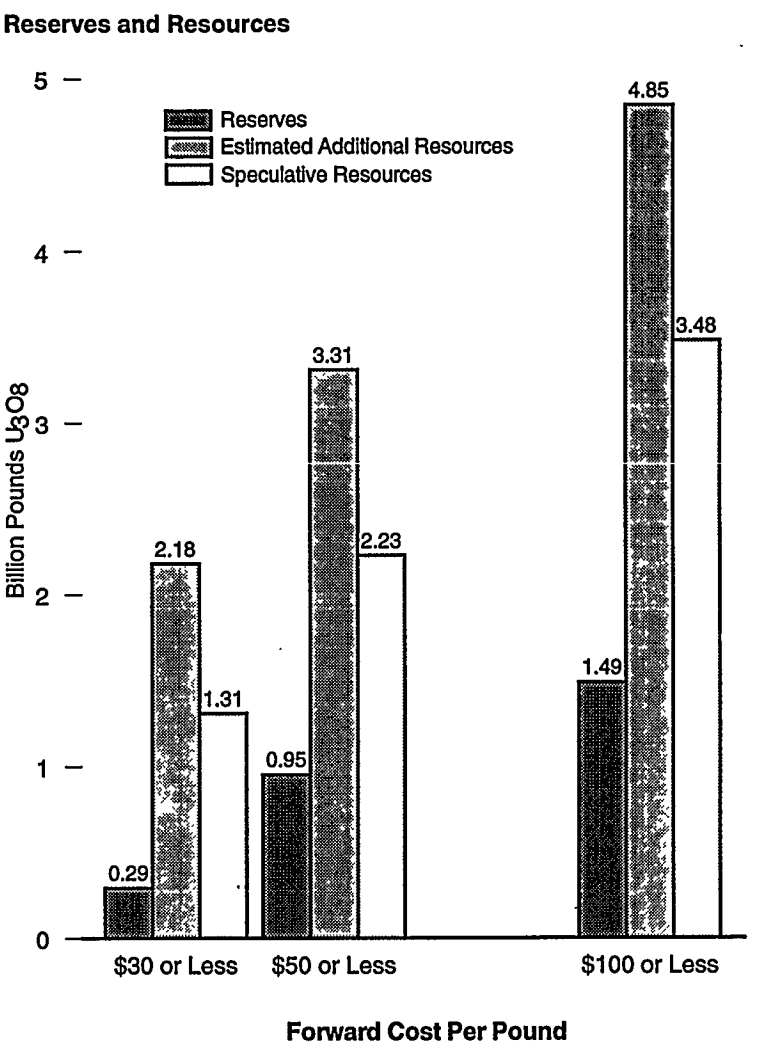
NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1981—U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, January 1, 1983, Report No. GJO-100 (1983), Table VIII-5. • 1982-1984—Energy Information Administration (EIA), *Uranium Industry Annual 1993* (September 1994), Table 3. • 1985—EIA, *Uranium Industry Annual 1994* (July 1995), Table 4. • 1986 forward—EIA, *Uranium Industry Annual 1995* (May 1996), Table 1.

# Figure 4.13 Uranium Reserves and Resources, December 31, 1995




Note: States shaded by group correspond to categories listed under "Reserves" on Table 4.13.

Source: Table 4.13.

# Table 4.13 Uranium Reserves and Resources, December 31, 1995

(Million Pounds $U_3O_8$)

| Resource Category and State | Forward Cost Category (dollars per pound) [1] | | |
|---|---|---|---|
| | $30 or Less | $50 or Less | $100 or Less |
| **Reserves** [2] | 290 | 947 | 1,493 |
| New Mexico | 84 | 350 | 579 |
| Wyoming | 117 | 387 | 613 |
| Texas | 11 | 29 | 49 |
| Arizona, Colorado, Utah | 43 | 119 | 165 |
| Others [3] | 35 | 61 | 87 |
| **Potential Resources** [4] | | | |
| Estimated Additional Resources | 2,180 | 3,310 | 4,850 |
| Speculative Resources | 1,310 | 2,230 | 3,480 |

[1] Forward costs are all operating and capital costs (in current dollars) yet to be incurred in the production of uranium from estimated resources. Excluded are previous expenditures (such as exploration and land acquisitions), taxes, profit, and the cost of money. Generally, forward costs are lower than market prices. Resource values in forward-cost categories are cumulative, that is, the quantity at each level of forward-cost includes all reserves/resources at the lower cost in that category.

[2] The Energy Information Administration category of uranium reserves is equivalent to the internationally reported category of Reasonably Assured Resources (RAR).

[3] California, Idaho, Nebraska, Nevada, North Dakota, Oregon, South Dakota, and Washington.

[4] Shown are the mean values for the distribution of estimates for each forward-cost category, rounded to the nearest 10 million pounds $U_3O_8$.

Sources: • Forward Costs $30 or Less or $50 or Less—Energy Information Administration (EIA), *Uranium Industry Annual 1995* (May 1995), Tables B1 and B4. • Forward Costs $100 or Less—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels database as of December 31, 1995.

## Energy Resources Notes

1. There are numerous more recent, nongovernment-generated natural gas resource estimates that are larger, in part because (a) they include natural gas from such sources as coalbeds and tight sands beyond the conventionally producible reservoirs that were included in the 1987 Department of the Interior estimate, and (b) they reflect larger estimates of ultimate recovery appreciation. For example, the Potential Gas Committee's latest mean estimate, published in "Potential Supply of Natural Gas in the United States, December 31, 1994," is 1,028 trillion cubic feet. The National Petroleum Council's one-time, 1992 mean estimate, published in "The Potential for Natural Gas in the United States: Source and Supply," was 1,065 trillion cubic feet.

The onshore and State waters portion of the 1995 Department of the Interior National Oil and Gas Resource assessment is reported in U.S. Geological Survey Circular 1118, *1995 National Assessment of United States Oil and Gas Resources*. Minerals Management Service data on the Federal offshore portion were not available in time for publication in this report.

2. For 1970 forward, annual well completions are estimated by the Energy Information Administration (EIA) by using the American Petroleum Institute's drilling data files. For more recent years, these files are not complete, due to delays in the reporting of wells drilled. Based on statistical analysis, EIA employs an adjustment process to impute missing data to show total well completions and footages for current years.

# 5. Petroleum

## Fluctuations in Prices

After the oil embargo in 1973-1974, the average annual composite refiner acquisition cost, in real terms,[1] of a barrel of crude oil rose to $23.56 in 1974, double the price in 1973 (5.19).* Successive price hikes in following years brought the real price of crude oil to an all-time high of $53.47 per barrel in 1981. In 1982, however, oil prices began trending downward and then plummeted in 1986. The real price per barrel of crude oil fell from $34.12 in 1985 to $18.05 in 1986. Of the several factors contributing to the unprecedented decline in crude oil prices during 1986, the most important was increased worldwide production, primarily by members of the Organization of Petroleum Exporting Countries (OPEC) seeking to regain market share.

After 1986, crude oil prices fluctuated. In 1990, the Iraqi invasion of Kuwait drove up the real price of a barrel of crude oil to $23.74. In 1991, oil-producing nations' ability to replace Iraqi and Kuwaiti oil, coupled with an economic recession that restrained petroleum demand, caused the real price to decline to $19.59 per barrel. The following year, the real price of crude oil declined to $18.43 per barrel, despite political unrest in several oil-producing countries (most notably Russia) and the oil sales embargo on Iraq, as well as attempts by OPEC to bolster crude oil prices. In 1993, due to restrained demand and increased production worldwide, the real price of crude oil fell to $15.99. In 1994, the real price of crude oil fell to $14.85, the lowest annual average in 21 years. Despite continued growth in worldwide production in 1995, the real price of crude oil rose 7.9 percent to $16.03.

The end-use prices, excluding taxes, of most petroleum products also increased in 1995 (5.20). The average price of all types of motor gasoline rose from 74 cents per gallon in 1994 to 77 cents per gallon in 1995. Aviation gasoline, kerosene-type jet fuel, residual fuel oil, and No. 2 diesel oil average prices, excluding taxes, also increased. In contrast, the average prices per gallon, excluding taxes, of kerosene, propane, and No. 2 fuel oil declined in 1995.

[1]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Production and Productivity

During much of the 1950's and 1960's, production capacity exceeded demand to such an extent that such mechanisms as production pro-rationing and import ceilings were implemented to protect domestic production. By the 1970's, however, petroleum demand had increased, the average productivity of wells began to decline, and oil production leveled off (5.2). Increases in Alaskan production at the end of the 1970's and through 1988 partially counteracted declines in Lower-48 production. In 1989, however, even Alaskan production began to decline. In 1995, U.S. crude oil production totaled 6.5 million barrels per day, the lowest level in 41 years.

***In 1995, U.S. crude oil production totaled 6.5 million barrels per day, the lowest level in 41 years.***

Of total U.S. production in 1995, 79 percent came from onshore wells and 21 percent from offshore. The 574 thousand producing wells attained an average productivity of 11 barrels per day per well, down 0.9 percent from the 1994 level and significantly below peak productivity of over 18 barrels attained in the early 1970's.

## Imports and Exports

Despite import quotas, net imports of low-priced petroleum increased throughout most of the 1949-to-1973 period, and in 1973 totaled 6.0 million barrels per day (5.1). Thereafter, net imports fluctuated, peaking at 8.6 million barrels per day in 1977, then declining to 4.3 million barrels per day in 1985. In 1986, excess world production drove prices down, inhibiting domestic production and boosting demand, and net imports totaled 5.4 million barrels per day. Subsequently, with prices significantly below peak levels, net imports rose to 7.2 million barrels

per day in 1989 and 1990. In 1991, lower demand for petroleum due to the economic recession contributed to a decline in petroleum imports. In addition, in 1991, the United States exported a record level of petroleum products, and petroleum net imports declined to 6.6 million barrels per day. Thereafter, economic recovery contributed to growth in net imports of petroleum, which totaled 7.9 million barrels per day in 1995.

U.S. dependence on petroleum net imports peaked at 46.5 percent of consumption in 1977, then fell in 1985 to 27.3 percent, the lowest level since 1971 (5.7). In 1994, dependence on petroleum net imports reached a 17-year high of 45.5 percent. In 1995, dependence was 44.5 percent. Venezuela, Saudi Arabia, Canada, Mexico, and Nigeria were the primary foreign suppliers of petroleum to the United States.

## Consumption of Petroleum Products

Consumption of petroleum products (petroleum products supplied) increased throughout the 1949-to-1973 period at an average annual rate of 4.7 percent, and, by 1973, consumption of petroleum products totaled 17.3 million barrels per day (5.1). In 1974, however, marked increases in the price of crude oil, coupled with a petroleum supply interruption caused by the oil embargo, resulted in a 3.8-percent decline in petroleum consumption. Although demand recovered during the late 1970's, peaking at 18.9 million barrels per day in 1978, by 1983 it had declined to 15.2 million barrels per day. After 1983, lower crude oil prices tended to promote consumption, which reached 17.3 million barrels per day in 1989. In 1990 and 1991, however, warm winters and a stagnant economy combined to restrain petroleum consumption, which fell to 16.7 million barrels per day in 1991. The subsequent economic recovery contributed to an increase in consumption to 17.7 million barrels per day in both 1994 and 1995.

Consumption of most petroleum products in 1995 remained near 1994 levels (5.11). Consumption of motor gasoline, which consistently accounts for the largest share of all petroleum products, exhibited the largest increase; it rose 2.5 percent to 7.8 million barrels per day. Distillate fuel oil consumption totaled 3.2 million barrels per day, consumption of jet fuel totaled 1.5 million barrels per day, and consumption of liquefied petroleum gases totaled 1.9 million barrels per day in 1995. By contrast, consumption of residual fuel oil fell 17 percent to 0.9 million barrels per day, the lowest level since at least 1949. Demand for residual fuel oil declined because the electric utility and industrial sectors continued to increase their consumption of natural gas (6.6).

## The Refining Industry in a Changing Market

The average daily output from U.S. refineries trended upward from 1949 through 1978, when it peaked at 16 million barrels per day (5.8). During the next 5 years, output declined, falling to 13 million barrels per day in 1983. As crude oil prices declined in the mid-1980's and the demand for petroleum rose, refinery output began to recover. In 1994, it averaged 16 million barrels per day for the third consecutive year.

The rate of refinery utilization fell below 80 percent in 1980 through 1985, despite deactivation of refinery capacity (5.9). Thereafter, the utilization rate improved. In 1986, the rate was 83 percent, well above its nadir of 69 percent in 1981. After 1986, strong product demand contributed to even higher utilization rates, which reached a 21-year high of 93 percent in 1994. In 1995, the utilization rate was 92 percent.

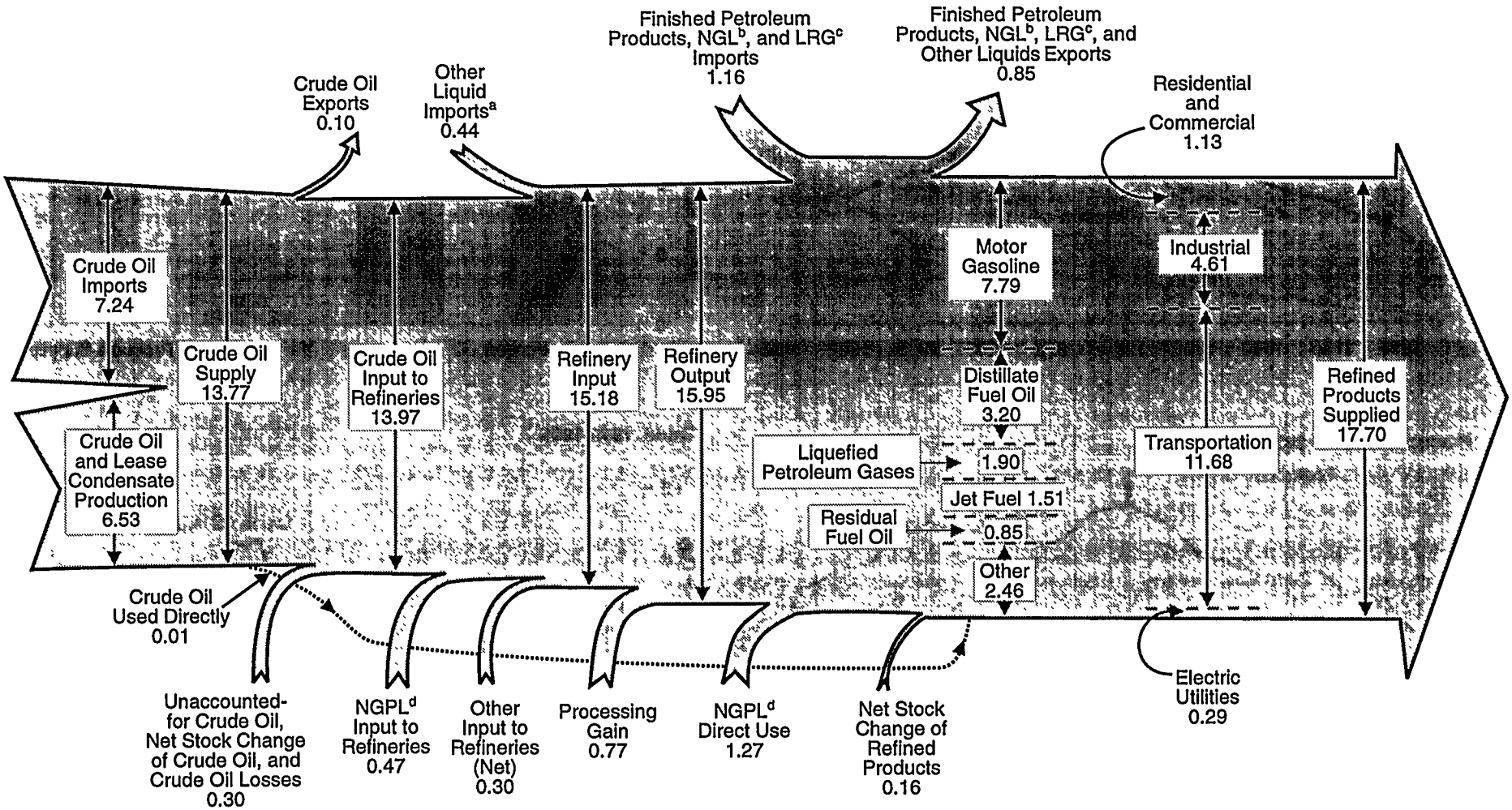
### Petroleum Stocks and the Strategic Petroleum Reserve

The U.S. Government established the Strategic Petroleum Reserve (SPR) in response to the oil supply disruptions of the early 1970's. Intended to minimize the effects of any future disruptions, the SPR began storing crude oil in 1977, and by the end of 1989, it held 580 million barrels (5.15). The first sales of SPR crude oil occurred following the Iraqi invasion of Kuwait in August 1990. In addition, SPR purchases were suspended in August 1990 due to concern about world crude oil supplies. Purchases resumed in 1992. At the end of 1995, the SPR held 592 million barrels.

One measure of the SPR's adequacy is the number of days of petroleum net imports it could provide in the event of an oil supply interruption. Through 1985, that measure of energy security increased every year, due to additions to the SPR and a decline in the level of net imports. In 1986, however, the measure declined for the first time, from 115 days in 1985 to 94 days in 1986. In 1994, the measure was 73 days, the lowest in 12 years. Although SPR stocks in 1995 remained at the 1994 level, a decrease in petroleum net imports caused the measure to increase to 75 days.

At the end of 1995, SPR stocks, plus 302 million barrels of privately held crude oil stocks, totaled 893 million barrels (5.14). Private stocks of crude oil were less than the 340-million-barrel level recorded in 1977, when filling of the SPR began. At 668 million barrels, private stocks of petroleum products in 1995 remained considerably below the record level of 964 million barrels recorded in 1977.

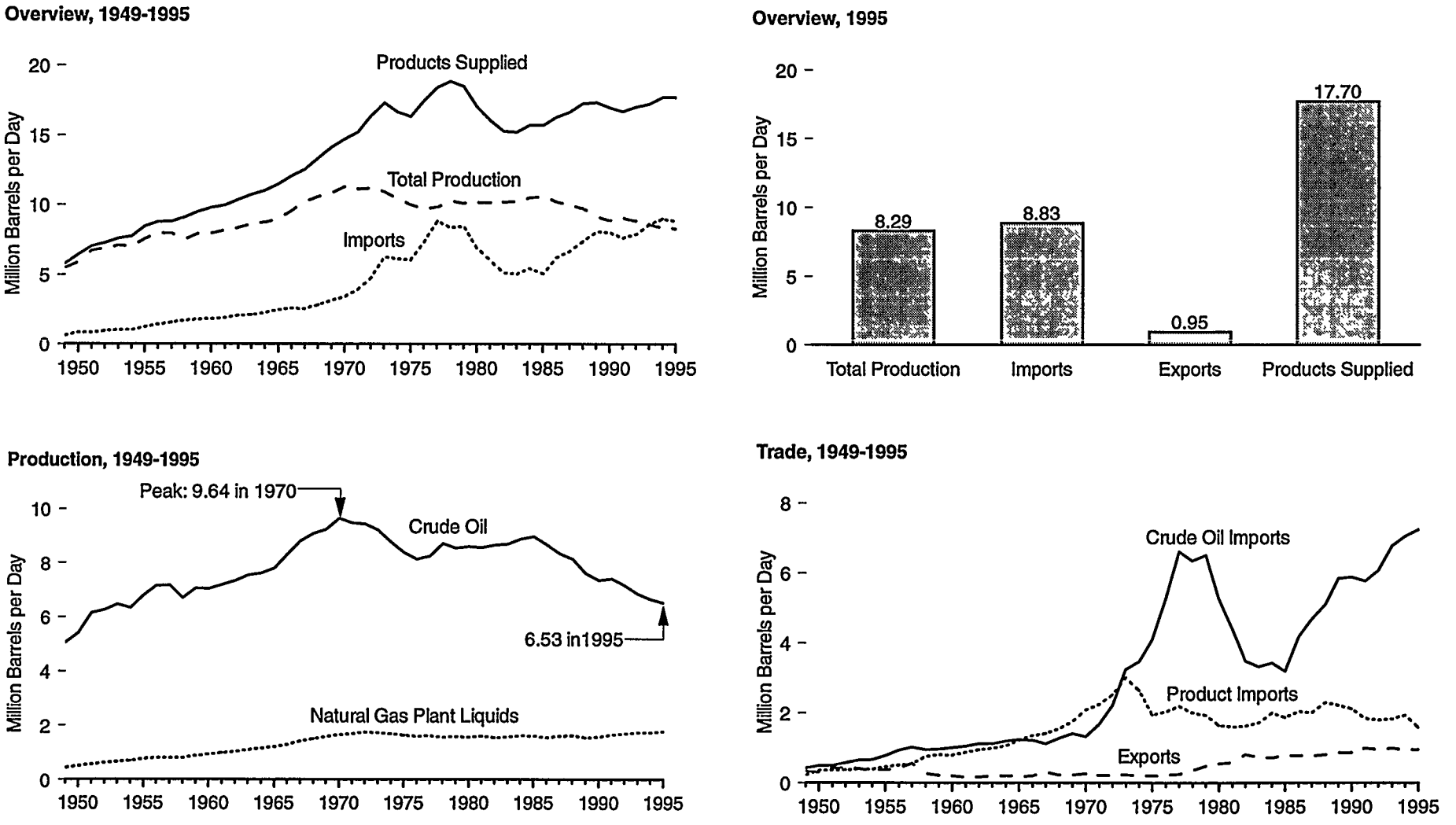
## Diagram 2. Petroleum Flow, 1995
(Million Barrels per Day)




[a]Unfinished oils, motor gasoline and aviation gasoline blending components, and other hydrocarbons, and oxygenates.
[b]Natural gas liquids.
[c]Liquefied refinery gas.
[d]Natural gas plant liquids.

Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 5.1, 5.5, 5.8, 5.11, 5.12a, and 5.12b, and *Petroleum Supply Monthly*, February 1996, Table 3.

# Figure 5.1 Petroleum Overview




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.1.

# Table 5.1 Petroleum Overview, 1949-1995

(Million Barrels per Day)

| Year | Production | | | Other Domestic Supply [2] | Trade | | | | | Crude Oil Losses | Change in Stocks [6] | Petroleum Products Supplied |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Crude Oil [1] | Natural Gas Plant Liquids | Total Production | | Crude Oil Imports [3] | Petroleum Product Imports [4] | Total Imports | Total Exports | Net Imports [5] | | | |
| 1949 | 5.05 | 0.43 | 5.48 | (s) | 0.42 | 0.22 | 0.65 | 0.33 | 0.32 | 0.04 | 0.01 | 5.76 |
| 1950 | 5.41 | 0.50 | 5.91 | (s) | 0.49 | 0.36 | 0.85 | 0.30 | 0.55 | 0.05 | 0.06 | 6.46 |
| 1951 | 6.16 | 0.56 | 6.72 | 0.01 | 0.49 | 0.35 | 0.84 | 0.42 | 0.42 | 0.03 | -0.10 | 7.02 |
| 1952 | 6.26 | 0.61 | 6.87 | 0.01 | 0.57 | 0.38 | 0.95 | 0.43 | 0.52 | 0.02 | -0.11 | 7.27 |
| 1953 | 6.46 | 0.65 | 7.11 | 0.02 | 0.65 | 0.39 | 1.03 | 0.40 | 0.63 | 0.02 | -0.14 | 7.60 |
| 1954 | 6.34 | 0.69 | 7.03 | 0.02 | 0.66 | 0.40 | 1.05 | 0.36 | 0.70 | 0.03 | 0.03 | 7.76 |
| 1955 | 6.81 | 0.77 | 7.58 | 0.04 | 0.78 | 0.47 | 1.25 | 0.37 | 0.88 | 0.04 | (s) | 8.46 |
| 1956 | 7.15 | 0.80 | 7.95 | 0.04 | 0.93 | 0.50 | 1.44 | 0.43 | 1.01 | 0.05 | -0.18 | 8.78 |
| 1957 | 7.17 | 0.81 | 7.98 | 0.04 | 1.02 | 0.55 | 1.57 | 0.57 | 1.01 | 0.05 | -0.17 | 8.81 |
| 1958 | 6.71 | 0.81 | 7.52 | 0.06 | 0.95 | 0.75 | 1.70 | 0.28 | 1.42 | 0.03 | 0.14 | 9.12 |
| 1959 | 7.05 | 0.88 | 7.93 | 0.09 | 0.97 | 0.81 | 1.78 | 0.21 | 1.57 | 0.01 | -0.05 | 9.53 |
| 1960 | 7.04 | 0.93 | 7.96 | 0.15 | 1.02 | 0.80 | 1.81 | 0.20 | 1.61 | 0.01 | 0.08 | 9.80 |
| 1961 | 7.18 | 0.99 | 8.17 | 0.18 | 1.05 | 0.87 | 1.92 | 0.17 | 1.74 | 0.01 | -0.11 | 9.98 |
| 1962 | 7.33 | 1.02 | 8.35 | 0.18 | 1.13 | 0.96 | 2.08 | 0.17 | 1.91 | 0.01 | -0.03 | 10.40 |
| 1963 | 7.54 | 1.10 | 8.64 | 0.20 | 1.13 | 0.99 | 2.12 | 0.21 | 1.91 | 0.01 | (s) | 10.74 |
| 1964 | 7.61 | 1.15 | 8.77 | 0.22 | 1.20 | 1.06 | 2.26 | 0.20 | 2.06 | 0.01 | -0.01 | 11.02 |
| 1965 | 7.80 | 1.21 | 9.01 | 0.22 | 1.24 | 1.23 | 2.47 | 0.19 | 2.28 | 0.01 | 0.01 | 11.51 |
| 1966 | 8.30 | 1.28 | 9.58 | 0.25 | 1.22 | 1.35 | 2.57 | 0.20 | 2.37 | 0.01 | -0.10 | 12.08 |
| 1967 | 8.81 | 1.41 | 10.22 | 0.29 | 1.13 | 1.41 | 2.54 | 0.31 | 2.23 | 0.01 | -0.17 | 12.56 |
| 1968 | 9.10 | 1.50 | 10.60 | 0.35 | 1.29 | 1.55 | 2.84 | 0.23 | 2.61 | 0.01 | -0.15 | 13.39 |
| 1969 | 9.24 | 1.59 | 10.83 | 0.34 | 1.41 | 1.76 | 3.17 | 0.23 | 2.93 | 0.01 | 0.05 | 14.14 |
| 1970 | 9.64 | 1.66 | 11.30 | 0.35 | 1.32 | 2.10 | 3.42 | 0.26 | 3.16 | 0.01 | -0.10 | 14.70 |
| 1971 | 9.46 | 1.69 | 11.16 | 0.44 | 1.68 | 2.25 | 3.93 | 0.22 | 3.70 | 0.01 | -0.07 | 15.21 |
| 1972 | 9.44 | 1.74 | 11.18 | 0.44 | 2.22 | 2.53 | 4.74 | 0.22 | 4.52 | 0.01 | 0.23 | 16.37 |
| 1973 | 9.21 | 1.74 | 10.95 | 0.49 | 3.24 | 3.01 | 6.26 | 0.23 | 6.02 | 0.01 | -0.14 | 17.31 |
| 1974 | 8.77 | 1.69 | 10.46 | 0.49 | 3.48 | 2.64 | 6.11 | 0.22 | 5.89 | 0.01 | -0.18 | 16.65 |
| 1975 | 8.37 | 1.63 | 10.01 | 0.51 | 4.10 | 1.95 | 6.06 | 0.21 | 5.85 | 0.01 | -0.03 | 16.32 |
| 1976 | 8.13 | 1.60 | 9.74 | 0.59 | 5.29 | 2.03 | 7.31 | 0.22 | 7.09 | 0.01 | 0.06 | 17.46 |
| 1977 | 8.24 | 1.62 | 9.86 | 0.57 | 6.61 | 2.19 | 8.81 | 0.24 | 8.56 | 0.02 | -0.55 | 18.43 |
| 1978 | 8.71 | 1.57 | 10.27 | 0.49 | 6.36 | 2.01 | 8.36 | 0.36 | 8.00 | 0.02 | 0.09 | 18.85 |
| 1979 | 8.55 | 1.58 | 10.14 | 0.58 | 6.52 | 1.94 | 8.46 | 0.47 | 7.99 | 0.02 | -0.17 | 18.51 |
| 1980 | 8.60 | 1.57 | 10.17 | 0.68 | 5.26 | 1.65 | 6.91 | 0.54 | 6.36 | 0.01 | -0.14 | 17.06 |
| 1981 | 8.57 | 1.61 | 10.18 | 0.64 | 4.40 | 1.60 | 6.00 | 0.59 | 5.40 | (s) | -0.16 | 16.06 |
| 1982 | 8.65 | 1.55 | 10.20 | 0.65 | 3.49 | 1.63 | 5.11 | 0.82 | 4.30 | (s) | 0.15 | 15.30 |
| 1983 | 8.69 | 1.56 | 10.25 | 0.65 | 3.33 | 1.72 | 5.05 | 0.74 | 4.31 | (s) | 0.02 | 15.23 |
| 1984 | 8.88 | 1.63 | 10.51 | 0.78 | 3.43 | 2.01 | 5.44 | 0.72 | 4.72 | (s) | -0.28 | 15.73 |
| 1985 | 8.97 | 1.61 | 10.58 | 0.76 | 3.20 | 1.87 | 5.07 | 0.78 | 4.29 | (s) | 0.10 | 15.73 |
| 1986 | 8.68 | 1.55 | 10.23 | 0.81 | 4.18 | 2.05 | 6.22 | 0.78 | 5.44 | (s) | -0.20 | 16.28 |
| 1987 | 8.35 | 1.60 | 9.94 | 0.85 | 4.67 | 2.00 | 6.68 | 0.76 | 5.91 | (s) | -0.04 | 16.67 |
| 1988 | 8.14 | 1.62 | 9.76 | 0.90 | 5.11 | 2.30 | 7.40 | 0.82 | 6.59 | (s) | 0.03 | 17.28 |
| 1989 | 7.61 | 1.55 | 9.16 | 0.92 | 5.84 | 2.22 | 8.06 | 0.86 | 7.20 | (s) | 0.04 | 17.33 |
| 1990 | 7.36 | 1.56 | 8.91 | 1.02 | 5.89 | 2.12 | 8.02 | 0.86 | 7.16 | (s) | 0.11 | 16.99 |
| 1991 | 7.42 | 1.66 | 9.08 | 1.00 | 5.78 | 1.84 | 7.63 | 1.00 | 6.63 | (s) | -0.01 | 16.71 |
| 1992 | 7.17 | 1.70 | 8.87 | 1.16 | 6.08 | 1.80 | 7.89 | 0.95 | 6.94 | (s) | 0.07 | 17.03 |
| 1993 | 6.85 | 1.74 | 8.58 | 1.19 | 6.79 | 1.83 | 8.62 | 1.00 | 7.62 | (s) | 0.15 | 17.24 |
| 1994 | R6.66 | 1.73 | R8.39 | R1.29 | R7.06 | R1.93 | R9.00 | 0.94 | R8.05 | (s) | 0.02 | R17.72 |
| 1995P | 6.53 | 1.76 | 8.29 | 1.28 | 7.24 | 1.59 | 8.83 | 0.95 | 7.88 | (s) | -0.25 | 17.70 |

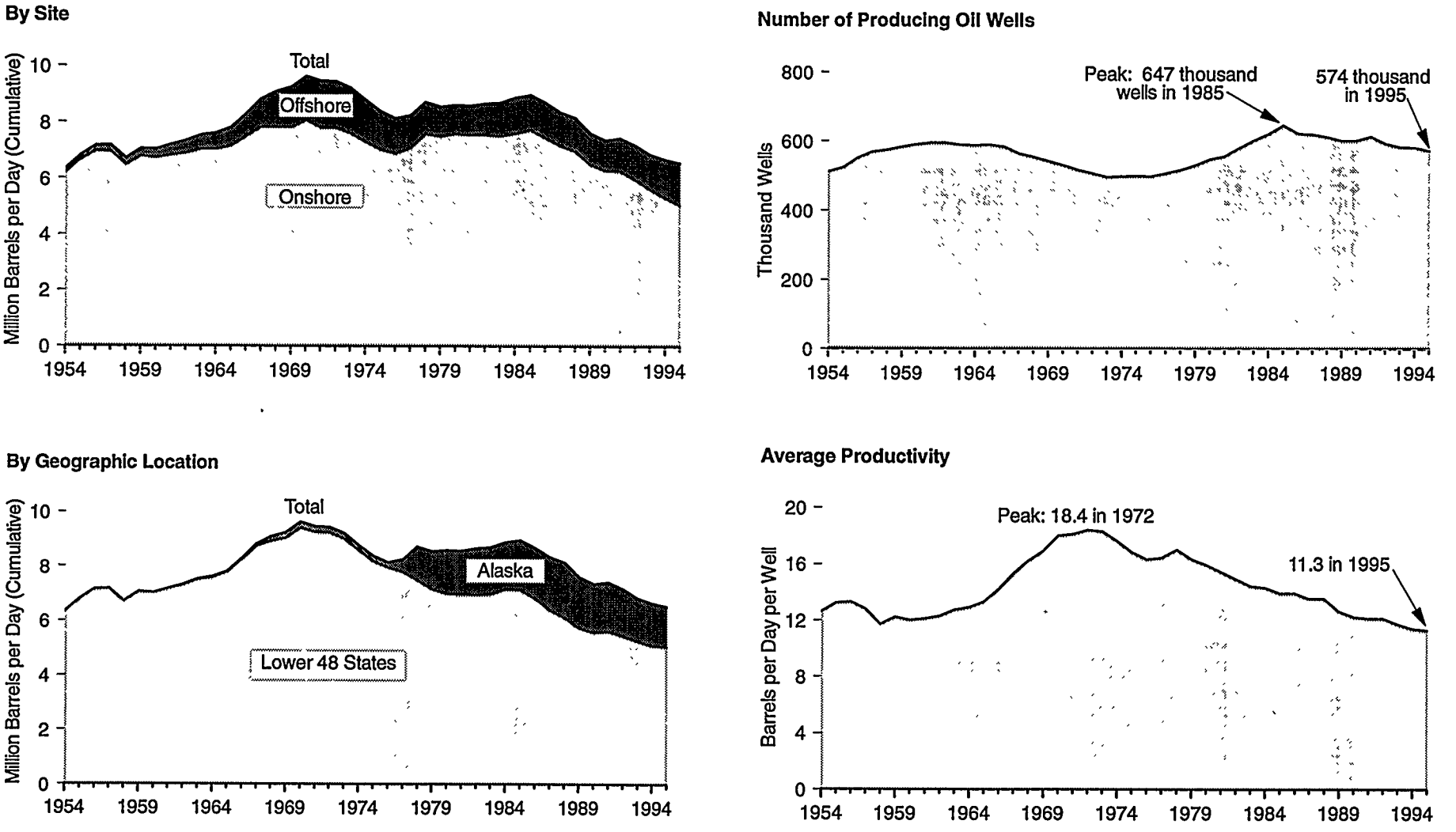
[1] Includes lease condensate.
[2] Includes benzol, other hydrocarbons, oxygenates, gasoline blending components, finished petroleum products, hydrogen, alcohol, processing gains, and unaccounted-for crude oil.
[3] Includes imports for the Strategic Petroleum Reserve, which began in 1977.
[4] For 1981 forward, includes motor gasoline blending components and aviation gasoline blending components.
[5] Net imports = imports minus exports.
[6] Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.

R=Revised data. P=Preliminary.data. (s)=Less than 5,000 barrels per day.

Note: Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1995




Source: Table 5.2.

# Table 5.2 Crude Oil and Lease Condensate Production and Oil Well Productivity, 1954-1995

(Thousand Barrels per Day, Except as Noted)

| Year | Geographic Location | | Site | | Type | | Total Production | Oil Well Productivity | |
|---|---|---|---|---|---|---|---|---|---|
| | Lower 48 | Alaska | Onshore | Offshore | Crude Oil | Lease Condensate | | Producing Wells [1] (thousands) | Average Productivity [2] (barrels per day per well) |
| 1954 | 6,342 | 0 | 6,209 | 133 | 6,342 | (3) | 6,342 | 511 | 12.6 |
| 1955 | 6,807 | 0 | 6,645 | 162 | 6,807 | (3) | 6,807 | 524 | 13.2 |
| 1956 | 7,151 | 0 | 6,951 | 201 | 7,151 | (3) | 7,151 | 551 | 13.3 |
| 1957 | 7,170 | 0 | 6,940 | 229 | 7,170 | (3) | 7,170 | 569 | 12.8 |
| 1958 | 6,710 | 0 | 6,473 | 236 | 6,710 | (3) | 6,710 | 575 | 11.7 |
| 1959 | 7,053 | 1 | 6,779 | 274 | 7,054 | (3) | 7,054 | 583 | 12.2 |
| 1960 | 7,034 | 2 | 6,716 | 319 | 7,035 | (3) | 7,035 | 591 | 12.0 |
| 1961 | 7,166 | 17 | 6,817 | 365 | 7,183 | (3) | 7,183 | 595 | 12.1 |
| 1962 | 7,304 | 28 | 6,888 | 444 | 7,332 | (3) | 7,332 | 596 | 12.3 |
| 1963 | 7,512 | 29 | 7,026 | 515 | 7,542 | (3) | 7,542 | 589 | 12.7 |
| 1964 | 7,584 | 30 | 7,027 | 587 | 7,614 | (3) | 7,614 | 588 | 12.9 |
| 1965 | 7,774 | 30 | 7,140 | 665 | 7,804 | (3) | 7,804 | 589 | 13.3 |
| 1966 | 8,256 | 39 | 7,473 | 823 | 8,295 | (3) | 8,295 | 583 | 14.2 |
| 1967 | 8,730 | 80 | 7,802 | 1,009 | 8,810 | (3) | 8,810 | 565 | 15.3 |
| 1968 | 8,915 | 181 | 7,808 | 1,287 | 8,660 | 436 | 9,096 | 554 | 16.2 |
| 1969 | 9,035 | 203 | 7,797 | 1,441 | 8,778 | 460 | 9,238 | 542 | 16.9 |
| 1970 | 9,408 | 229 | 8,060 | 1,577 | 9,180 | 457 | 9,637 | 531 | 18.0 |
| 1971 | 9,245 | 218 | 7,779 | 1,684 | 9,032 | 431 | 9,463 | 517 | 18.1 |
| 1972 | 9,242 | 199 | 7,780 | 1,660 | 8,998 | 443 | 9,441 | 508 | 18.4 |
| 1973 | 9,010 | 198 | 7,592 | 1,616 | 8,784 | 424 | 9,208 | 497 | 18.3 |
| 1974 | 8,581 | 193 | 7,285 | 1,489 | 8,375 | 399 | 8,774 | 498 | 17.6 |
| 1975 | 8,183 | 191 | 7,012 | 1,362 | 8,007 | 367 | 8,375 | 500 | 16.8 |
| 1976 | 7,958 | 173 | 6,868 | 1,264 | 7,776 | 356 | 8,132 | 499 | 16.3 |
| 1977 | 7,781 | 464 | 7,069 | 1,176 | 7,875 | 370 | 8,245 | 507 | 16.4 |
| 1978 | 7,478 | 1,229 | 7,571 | 1,136 | 8,353 | 355 | 8,707 | 517 | 17.0 |
| 1979 | 7,151 | 1,401 | 7,485 | 1,067 | 8,181 | 371 | 8,552 | 531 | 16.3 |
| 1980 | 6,980 | 1,617 | 7,562 | 1,034 | 8,210 | 386 | 8,597 | 548 | 15.9 |
| 1981 | 6,962 | 1,609 | 7,537 | 1,034 | 8,176 | 395 | 8,572 | 557 | 15.4 |
| 1982 | 6,953 | 1,696 | 7,538 | 1,110 | 8,261 | 387 | 8,649 | 580 | 14.9 |
| 1983 | 6,974 | 1,714 | 7,492 | 1,196 | 8,688 | (3) | 8,688 | 603 | 14.4 |
| 1984 | 7,157 | 1,722 | 7,596 | 1,283 | 8,879 | (3) | 8,879 | 621 | 14.3 |
| 1985 | 7,146 | 1,825 | 7,722 | 1,250 | 8,971 | (3) | 8,971 | 647 | 13.9 |
| 1986 | 6,814 | 1,867 | 7,426 | 1,254 | 8,680 | (3) | 8,680 | 623 | 13.9 |
| 1987 | 6,387 | 1,962 | 7,153 | 1,196 | 8,349 | (3) | 8,349 | 620 | 13.5 |
| 1988 | 6,123 | 2,017 | 6,949 | 1,191 | 8,140 | (3) | 8,140 | 612 | 13.5 |
| 1989 | 5,739 | 1,874 | 6,486 | 1,127 | 7,613 | (3) | 7,613 | 603 | 12.6 |
| 1990 | 5,582 | 1,773 | 6,273 | 1,082 | 7,355 | (3) | 7,355 | 602 | 12.2 |
| 1991 | 5,618 | 1,798 | 6,245 | 1,172 | 7,417 | (3) | 7,417 | 614 | 12.1 |
| 1992 | 5,457 | 1,714 | 5,953 | 1,218 | 7,171 | (3) | 7,171 | 594 | 12.1 |
| 1993 | 5,264 | 1,582 | 5,606 | 1,241 | 6,847 | (3) | 6,847 | 584 | 11.7 |
| 1994 | R5,103 | R1,559 | R5,291 | R1,370 | R6,662 | (3) | R6,662 | 582 | 11.4 |
| 1995P | 5,046 | 1,484 | 5,180 | 1,350 | 6,530 | (3) | 6,530 | 574 | 11.3 |

[1] As of December 31.

[2] For 1954-1976, average productivity is based on the average number of producing wells. For 1977 forward, average productivity is based on the number of wells producing at end of year.

[3] Included in crude oil.

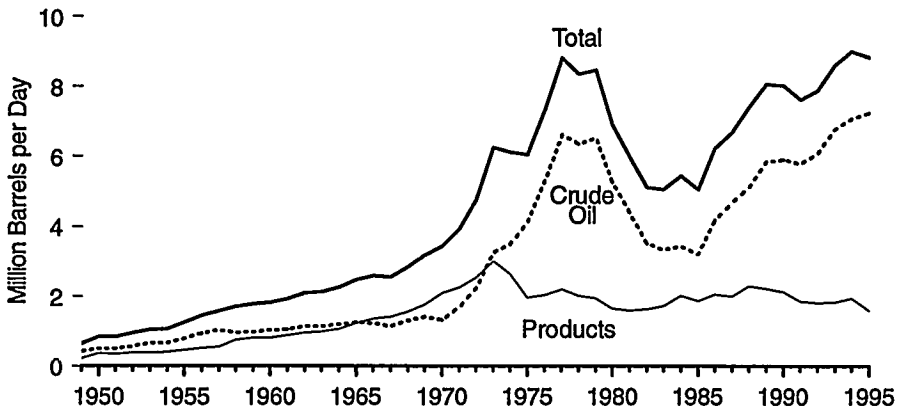
R=Revised data. P=Preliminary data.

Note: Totals may not equal sum of components due to independent rounding.

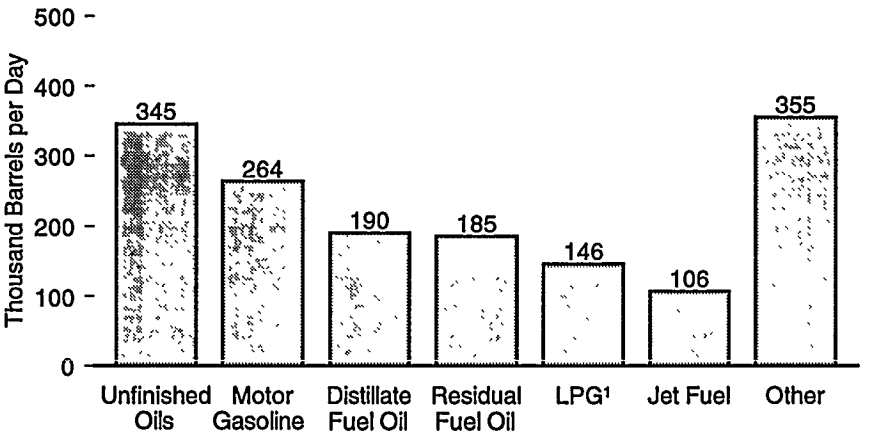
Sources: **Offshore:** • 1954-1969—U.S. Geological Survey, *Outer Continental Shelf Statistics*, June 1979. • 1970-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996). **Oil Well Productivity:** • 1954-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—Independent Petroleum Association of America, *The Oil Producing Industry in Your State.* • 1995—*World Oil*, February 1996. **All Other Data:** • 1954-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.3 Petroleum Imports by Type

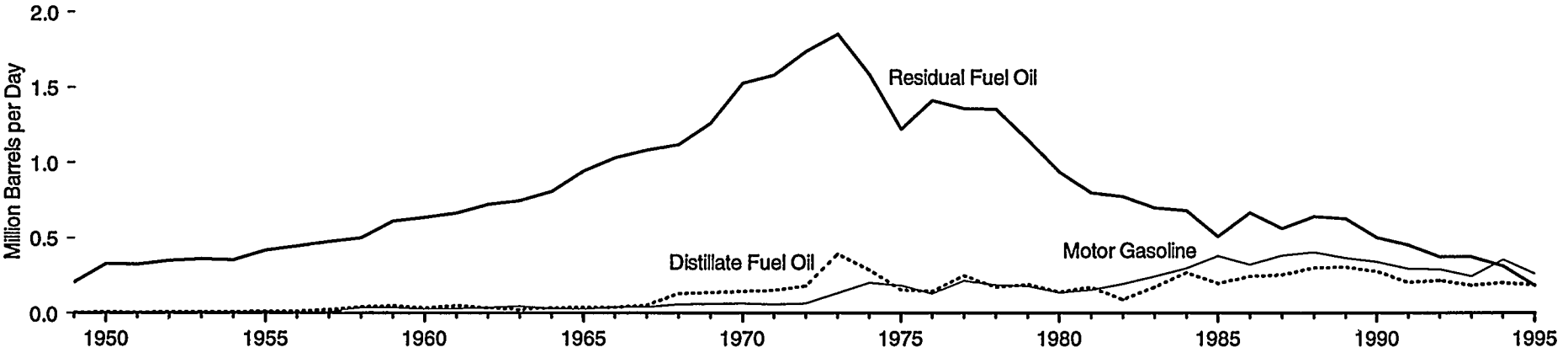
**Total, 1949-1995**




**By Product, 1995**




**By Selected Product, 1949-1995**




[1] Liquefied petroleum gases.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.3.

# Table 5.3 Petroleum Imports by Type, 1949-1995

(Thousand Barrels per Day)

| Year | Crude Oil [1] | Petroleum Products | | | | | | | | | Total Petroleum |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Distillate Fuel Oil | Jet Fuel [2] | Liquefied Petroleum Gases | | Motor Gasoline [4] | Residual Fuel Oil | Unfinished Oils | Other Products [5] | Total | |
| | | | | Propane [3] | Total | | | | | | |
| 1949 | 421 | 5 | NA | 0 | 0 | 0 | 206 | 10 | 3 | 224 | 645 |
| 1950 | 487 | 7 | NA | 0 | 0 | (s) | 329 | 21 | 6 | 363 | 850 |
| 1951 | 491 | 5 | NA | 0 | 0 | 1 | 326 | 14 | 7 | 354 | 844 |
| 1952 | 573 | 7 | NA | 0 | 0 | 5 | 351 | 9 | 7 | 380 | 952 |
| 1953 | 648 | 9 | NA | 0 | 0 | 1 | 360 | 9 | 7 | 386 | 1,034 |
| 1954 | 656 | 9 | NA | 0 | 0 | 3 | 354 | 21 | 9 | 396 | 1,052 |
| 1955 | 782 | 12 | NA | 0 | 0 | 13 | 417 | 15 | 9 | 466 | 1,248 |
| 1956 | 934 | 14 | 21 | 0 | 0 | 5 | 445 | 7 | 10 | 502 | 1,436 |
| 1957 | 1,023 | 23 | 25 | 0 | 0 | 8 | 475 | 3 | 18 | 552 | 1,574 |
| 1958 | 953 | 41 | 57 | 0 | 0 | 38 | 499 | 92 | 21 | 747 | 1,700 |
| 1959 | 965 | 48 | 37 | 0 | 0 | 37 | 610 | 63 | 19 | 814 | 1,780 |
| 1960 | 1,015 | 35 | 34 | NA | 4 | 27 | 637 | 45 | 17 | 799 | 1,815 |
| 1961 | 1,045 | 48 | 28 | NA | 5 | 29 | 666 | 69 | 26 | 872 | 1,917 |
| 1962 | 1,126 | 32 | 30 | NA | 6 | 38 | 724 | 89 | 36 | 955 | 2,082 |
| 1963 | 1,131 | 25 | 41 | NA | 7 | 44 | 747 | 87 | 41 | 992 | 2,123 |
| 1964 | 1,198 | 32 | 33 | NA | 11 | 29 | 808 | 89 | 58 | 1,060 | 2,259 |
| 1965 | 1,238 | 36 | 81 | NA | 21 | 28 | 946 | 92 | 27 | 1,229 | 2,468 |
| 1966 | 1,225 | 38 | 86 | NA | 29 | 43 | 1,032 | 97 | 24 | 1,348 | 2,573 |
| 1967 | 1,128 | 51 | 89 | 11 | 27 | 42 | 1,085 | 97 | 20 | 1,409 | 2,537 |
| 1968 | 1,291 | 132 | 105 | 15 | 32 | 59 | 1,120 | 80 | 22 | 1,549 | 2,840 |
| 1969 | 1,409 | 139 | 125 | 14 | 35 | 62 | 1,265 | 106 | 25 | 1,757 | 3,166 |
| 1970 | 1,324 | 147 | 144 | 26 | 52 | 67 | 1,528 | 108 | 49 | 2,095 | 3,419 |
| 1971 | 1,681 | 153 | 180 | 32 | 70 | 59 | 1,583 | 124 | 76 | 2,245 | 3,926 |
| 1972 | 2,216 | 182 | 194 | 43 | 89 | 68 | 1,742 | 125 | 126 | 2,525 | 4,741 |
| 1973 | 3,244 | 392 | 212 | 71 | 132 | 134 | 1,853 | 137 | 152 | 3,012 | 6,256 |
| 1974 | 3,477 | 289 | 163 | 59 | 123 | 204 | 1,587 | 121 | 148 | 2,635 | 6,112 |
| 1975 | 4,105 | 155 | 133 | 60 | 112 | 184 | 1,223 | 36 | 108 | 1,951 | 6,056 |
| 1976 | 5,287 | 146 | 76 | 68 | 130 | 131 | 1,413 | 32 | 97 | 2,026 | 7,313 |
| 1977 | 6,615 | 250 | 75 | 86 | 161 | 217 | 1,359 | 31 | 99 | 2,193 | 8,807 |
| 1978 | 6,356 | 173 | 86 | 57 | 123 | 190 | 1,355 | 27 | 53 | 2,008 | 8,363 |
| 1979 | 6,519 | 193 | 78 | 88 | 217 | 181 | 1,151 | 59 | 58 | 1,937 | 8,456 |
| 1980 | 5,263 | 142 | 80 | 69 | 216 | 140 | 939 | 55 | 76 | 1,646 | 6,909 |
| 1981 | 4,396 | 173 | 38 | 70 | 244 | 157 | 800 | 112 | 76 | 1,599 | 5,996 |
| 1982 | 3,488 | 93 | 29 | 63 | 226 | 197 | 776 | 174 | 131 | 1,625 | 5,113 |
| 1983 | 3,329 | 174 | 29 | 44 | 190 | 247 | 699 | 234 | 148 | 1,722 | 5,051 |
| 1984 | 3,426 | 272 | 62 | 67 | 195 | 299 | 681 | 231 | 272 | 2,011 | 5,437 |
| 1985 | 3,201 | 200 | 39 | 67 | 187 | 381 | 510 | 318 | 232 | 1,866 | 5,067 |
| 1986 | 4,178 | 247 | 57 | 110 | 242 | 326 | 669 | 250 | 254 | 2,045 | 6,224 |
| 1987 | 4,674 | 255 | 67 | 88 | 190 | 384 | 565 | 299 | 243 | 2,004 | 6,678 |
| 1988 | 5,107 | 302 | 90 | 106 | 209 | 405 | 644 | 360 | 285 | 2,295 | 7,402 |
| 1989 | 5,843 | 306 | 106 | 111 | 181 | 369 | 629 | 348 | 280 | 2,217 | 8,061 |
| 1990 | 5,894 | 278 | 108 | 115 | 188 | 342 | 504 | 413 | 291 | 2,123 | 8,018 |
| 1991 | 5,782 | 205 | 67 | 91 | 147 | 297 | 453 | 413 | 262 | 1,844 | 7,627 |
| 1992 | 6,083 | 216 | 82 | 85 | 131 | 294 | 375 | 443 | 264 | 1,805 | 7,888 |
| 1993 | 6,787 | 184 | 100 | 103 | 160 | 247 | 373 | 491 | 278 | 1,833 | 8,620 |
| 1994 | R7,063 | R203 | R117 | R124 | R183 | 356 | R314 | R413 | R348 | R1,933 | R8,996 |
| 1995P | 7,240 | 190 | 106 | 102 | 146 | 264 | 185 | 345 | 355 | 1,592 | 8,832 |

[1] Includes imports for the Strategic Petroleum Reserve, which began in 1977.

[2] Prior to 1965, imports of kerosene-type jet fuel were included with kerosene, which is listed under "Other Products."

[3] Includes propylene.

[4] Excludes motor gasoline blending components after 1980. Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas.

[5] Aviation gasoline, motor gasoline blending components, aviation gasoline blending components, kerosene, petrochemical feedstocks, special naphthas, lubricants, wax, asphalt and road oil, petroleum coke, pentanes plus, and miscellaneous products.

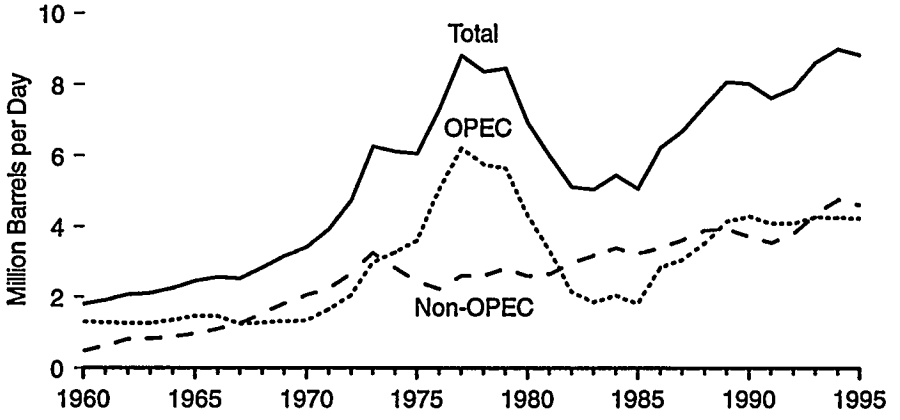
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.

Notes: • Includes imports from U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.

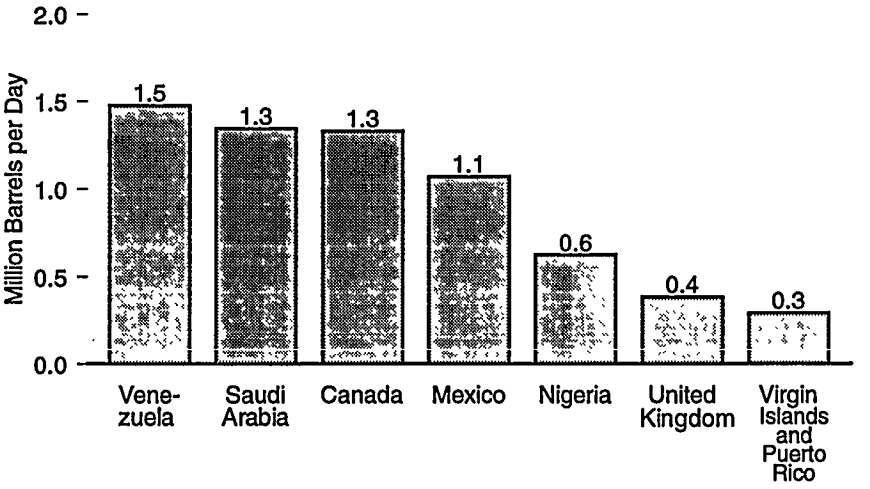
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.4 Petroleum Imports by Country of Origin

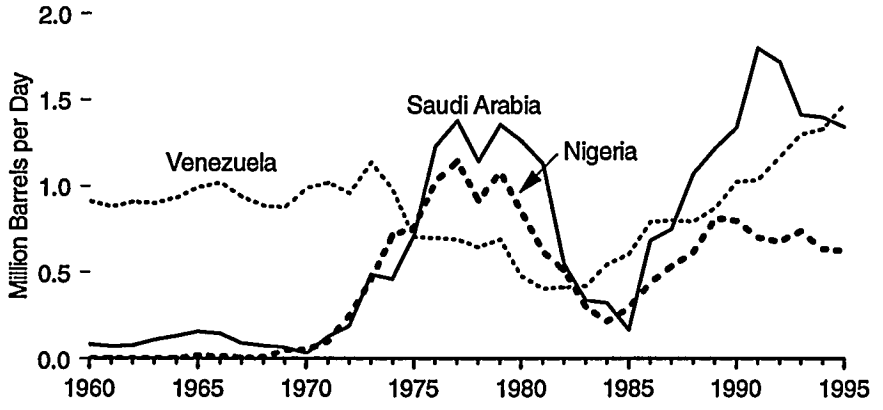
**Total, OPEC, and Non-OPEC, 1960-1995**



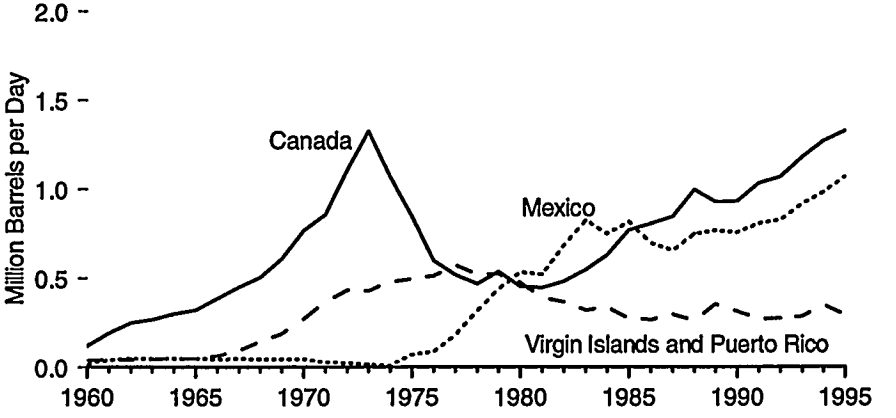

**Top Countries, 1995**




**Selected OPEC Countries, 1960-1995**




**Selected Non-OPEC Countries, 1960-1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.4.

# Table 5.4 Petroleum Imports by Country of Origin, 1960-1995

| Year | OPEC [1] | | | | | | Non-OPEC | | | | | Total Imports | Imports from Arab OPEC as Share of Total Imports | Imports from OPEC as Share of Total Imports |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nigeria | Saudi Arabia | Venezuela | Other [2] | Total [3] | Arab OPEC [4] | Canada | Mexico | United Kingdom | Virgin Islands and Puerto Rico | Other | | | |
| | Thousand Barrels per Day | | | | | | | | | | | | Percent | |
| 1960 | 0 | 84 | 911 | 319 | 1,314 | 292 | 120 | 16 | (s) | 36 | 328 | 1,815 | 16.1 | 72.4 |
| 1961 | 0 | 73 | 879 | 335 | 1,286 | 284 | 190 | 40 | 1 | 44 | 357 | 1,917 | 14.8 | 67.1 |
| 1962 | 0 | 74 | 906 | 286 | 1,265 | 241 | 250 | 49 | 2 | 41 | 475 | 2,082 | 11.6 | 60.8 |
| 1963 | 0 | 108 | 900 | 275 | 1,283 | 258 | 265 | 48 | 3 | 44 | 480 | 2,123 | 12.2 | 60.5 |
| 1964 | 0 | 131 | 933 | 296 | 1,361 | 293 | 299 | 47 | (s) | 47 | 505 | 2,259 | 13.0 | 60.2 |
| 1965 | 15 | 158 | 994 | 309 | 1,476 | 324 | 323 | 48 | (s) | 47 | 574 | 2,468 | 13.1 | 59.8 |
| 1966 | 11 | 147 | 1,018 | 295 | 1,471 | 300 | 384 | 45 | 6 | 61 | 606 | 2,573 | 11.7 | 57.2 |
| 1967 | 5 | 92 | 938 | 224 | 1,259 | 177 | 450 | 49 | 11 | 96 | 673 | 2,537 | 7.0 | 49.6 |
| 1968 | 9 | 74 | 886 | 333 | 1,302 | 272 | 506 | 45 | 28 | 145 | 814 | 2,840 | 9.6 | 45.9 |
| 1969 | 49 | 65 | 875 | 347 | 1,336 | 276 | 608 | 43 | 20 | 189 | 971 | 3,166 | 8.7 | 42.2 |
| 1970 | 50 | 30 | 989 | 275 | 1,343 | 196 | 766 | 42 | 11 | 271 | 985 | 3,419 | 5.7 | 39.3 |
| 1971 | 102 | 128 | 1,020 | 423 | 1,673 | 327 | 857 | 27 | 10 | 368 | 991 | 3,926 | 8.3 | 42.6 |
| 1972 | 251 | 190 | 959 | 663 | 2,063 | 530 | 1,108 | 21 | 9 | 432 | 1,108 | 4,741 | 11.2 | 43.5 |
| 1973 | 459 | 486 | 1,135 | 913 | 2,993 | 915 | 1,325 | 16 | 15 | 429 | 1,479 | 6,256 | 14.6 | 47.8 |
| 1974 | 713 | 461 | 979 | 1,126 | 3,280 | 752 | 1,070 | 8 | 8 | 481 | 1,265 | 6,112 | 12.3 | 53.7 |
| 1975 | 762 | 715 | 702 | 1,422 | 3,601 | 1,383 | 846 | 71 | 14 | 496 | 1,026 | 6,056 | 22.8 | 59.5 |
| 1976 | 1,025 | 1,230 | 700 | 2,111 | 5,066 | 2,424 | 599 | 87 | 31 | 510 | 1,019 | 7,313 | 33.2 | 69.3 |
| 1977 | 1,143 | 1,380 | 690 | 2,979 | 6,193 | 3,185 | 517 | 179 | 126 | 571 | 1,221 | 8,807 | 36.2 | 70.3 |
| 1978 | 919 | 1,144 | 646 | 3,043 | 5,751 | 2,963 | 467 | 318 | 180 | 522 | 1,126 | 8,363 | 35.4 | 68.8 |
| 1979 | 1,080 | 1,356 | 690 | 2,511 | 5,637 | 3,058 | 538 | 439 | 202 | 523 | 1,116 | 8,456 | 36.2 | 66.7 |
| 1980 | 857 | 1,261 | 481 | 1,701 | 4,300 | 2,551 | 455 | 533 | 176 | 476 | 969 | 6,909 | 36.9 | 62.2 |
| 1981 | 620 | 1,129 | 406 | 1,168 | 3,323 | 1,848 | 447 | 522 | 375 | 389 | 939 | 5,996 | 30.8 | 55.4 |
| 1982 | 514 | 552 | 412 | 668 | 2,146 | 854 | 482 | 685 | 456 | 366 | 979 | 5,113 | 16.7 | 42.0 |
| 1983 | 302 | 337 | 422 | 801 | 1,862 | 632 | 547 | 826 | 382 | 322 | 1,111 | 5,051 | 12.5 | 36.9 |
| 1984 | 216 | 325 | 548 | 960 | 2,049 | 819 | 630 | 748 | 402 | 336 | 1,273 | 5,437 | 15.1 | 37.7 |
| 1985 | 293 | 168 | 605 | 765 | 1,830 | 472 | 770 | 816 | 310 | 275 | 1,066 | 5,067 | 9.3 | 36.1 |
| 1986 | 440 | 685 | 793 | 918 | 2,837 | 1,162 | 807 | 699 | 350 | 265 | 1,267 | 6,224 | 18.7 | 45.6 |
| 1987 | 535 | 751 | 804 | 970 | 3,060 | 1,274 | 848 | 655 | 352 | 294 | 1,469 | 6,678 | 19.1 | 45.8 |
| 1988 | 618 | 1,073 | 794 | 1,034 | 3,520 | 1,839 | 999 | 747 | 315 | 264 | 1,557 | 7,402 | 24.8 | 47.6 |
| 1989 | 815 | 1,224 | 873 | 1,228 | 4,140 | 2,130 | 931 | 767 | 215 | 353 | 1,654 | 8,061 | 26.4 | 51.4 |
| 1990 | 800 | 1,339 | 1,025 | 1,132 | 4,296 | 2,244 | 934 | 755 | 189 | 315 | 1,529 | 8,018 | 28.0 | 53.6 |
| 1991 | 703 | 1,802 | 1,035 | 553 | 4,092 | 2,064 | 1,033 | 807 | 138 | 270 | 1,287 | 7,627 | 27.1 | 53.7 |
| 1992 | 681 | 1,720 | 1,170 | 521 | 4,092 | 1,974 | 1,069 | 830 | 230 | 275 | 1,392 | 7,888 | 25.0 | 51.9 |
| 1993 | 740 | 1,414 | 1,300 | 820 | 4,273 | 2,000 | 1,181 | 919 | 350 | 283 | 1,614 | 8,620 | 23.2 | 49.6 |
| 1994 | 637 | 1,402 | R1,334 | R873 | R4,247 | R1,970 | R1,272 | R984 | 458 | R350 | R1,686 | R8,996 | R21.9 | R47.2 |
| 1995P | 625 | 1,344 | 1,475 | 781 | 4,226 | 1,807 | 1,331 | 1,069 | 384 | 293 | 1,529 | 8,832 | 20.5 | 47.8 |

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Qatar, United Arab Emirates, and, through 1992, Ecuador, which withdrew from OPEC on December 31, 1992. Beginning with 1993, imports from Ecuador are included in the Non-OPEC "Other" column. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

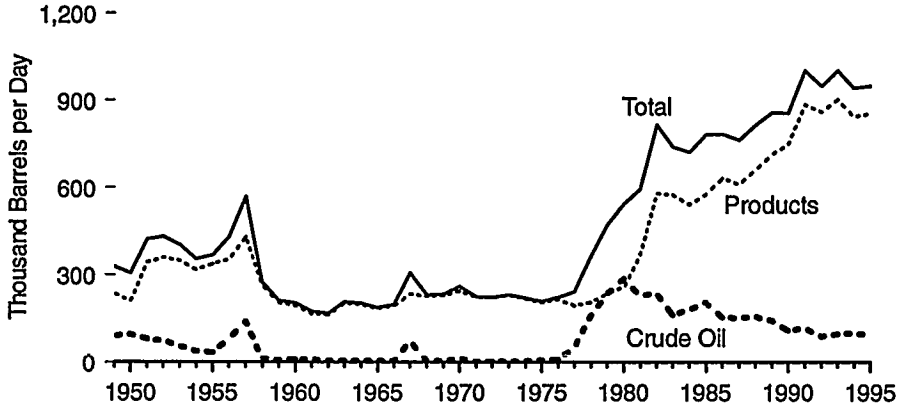
R=Revised data. P=Preliminary data. (s)=Less than 500 barrels per day.

Notes: • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

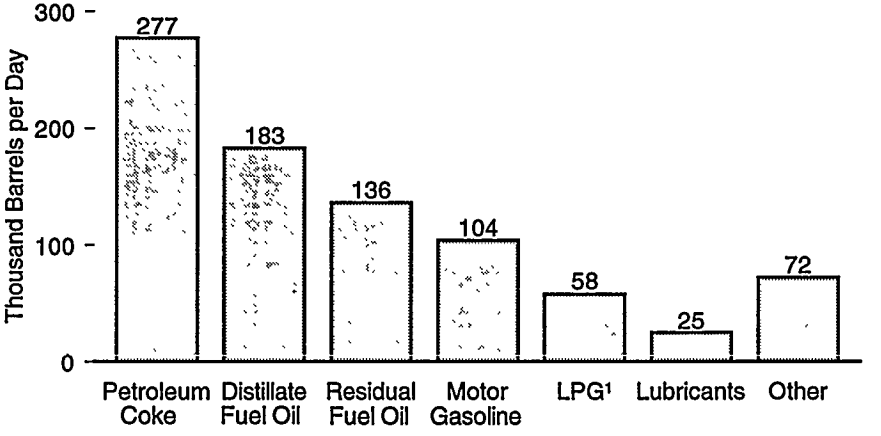
Sources: • 1960-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.5 Petroleum Exports by Type

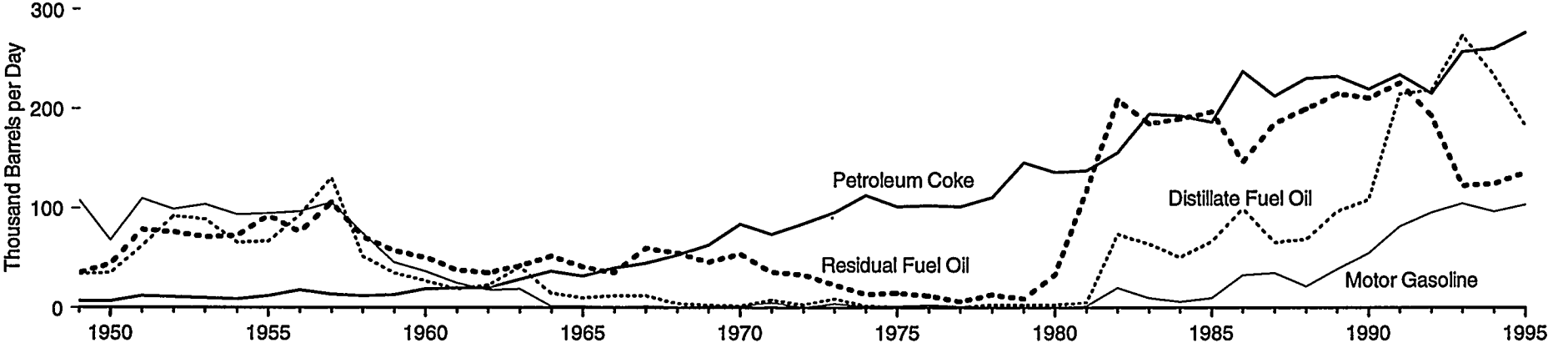
**Total, 1949-1995**




**By Product, 1995**




**By Selected Products, 1949-1995**




¹ Liquefied petroleum gases.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.5.

# Table 5.5 Petroleum Exports by Type, 1949-1995

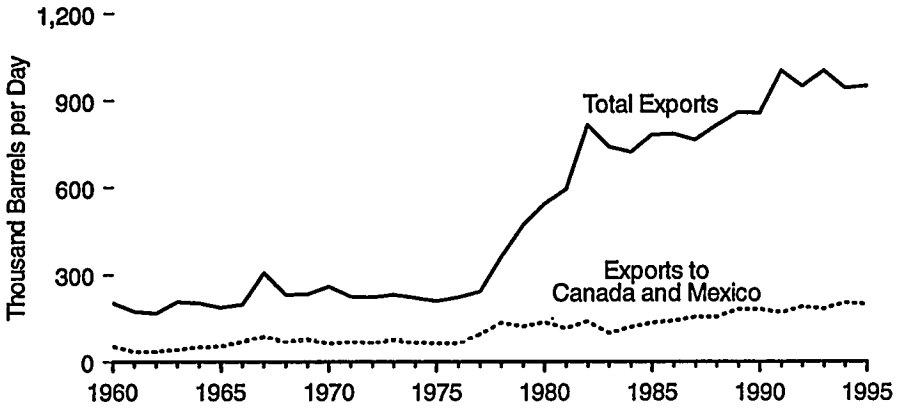
(Thousand Barrels per Day)

| Year | Crude Oil | Petroleum Products | | | | | | | | | | Total Petroleum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Distillate Fuel Oil | Liquefied Petroleum Gases | | Lubricants | Motor Gasoline [2] | Petroleum Coke | Petrochemical Feedstocks | Residual Fuel Oil | Other Products [3] | Total | |
| | | | Propane [1] | Total | | | | | | | | |
| 1949 | 91 | 34 | NA | 4 | 35 | 108 | 7 | 0 | 35 | 15 | 236 | 327 |
| 1950 | 95 | 35 | NA | 4 | 39 | 68 | 7 | 0 | 44 | 12 | 210 | 305 |
| 1951 | 78 | 62 | NA | 6 | 48 | 110 | 12 | 0 | 79 | 27 | 344 | 422 |
| 1952 | 73 | 92 | NA | 7 | 44 | 99 | 11 | 0 | 76 | 31 | 359 | 432 |
| 1953 | 55 | 89 | NA | 8 | 36 | 104 | 10 | 0 | 71 | 29 | 347 | 402 |
| 1954 | 37 | 66 | NA | 11 | 41 | 94 | 9 | 0 | 73 | 23 | 318 | 355 |
| 1955 | 32 | 67 | NA | 12 | 39 | 95 | 12 | 0 | 93 | 18 | 336 | 368 |
| 1956 | 78 | 94 | NA | 12 | 38 | 97 | 18 | 0 | 76 | 17 | 352 | 430 |
| 1957 | 138 | 131 | NA | 12 | 38 | 106 | 14 | 0 | 106 | 23 | 430 | 568 |
| 1958 | 12 | 52 | NA | 8 | 36 | 75 | 12 | 0 | 71 | 11 | 264 | 276 |
| 1959 | 7 | 35 | NA | 6 | 38 | 46 | 13 | 0 | 57 | 9 | 204 | 211 |
| 1960 | 8 | 27 | NA | 8 | 43 | 37 | 19 | 0 | 51 | 9 | 193 | 202 |
| 1961 | 9 | 19 | NA | 10 | 47 | 25 | 20 | 0 | 38 | 7 | 165 | 174 |
| 1962 | 5 | 23 | NA | 11 | 48 | 18 | 20 | 0 | 35 | 8 | 163 | 168 |
| 1963 | 5 | 41 | NA | 13 | 50 | 19 | 29 | 0 | 42 | 9 | 203 | 208 |
| 1964 | 4 | 15 | NA | 15 | 50 | 2 | 37 | 0 | 52 | 28 | 198 | 202 |
| 1965 | 3 | 10 | NA | 21 | 45 | 2 | 32 | 5 | 41 | 27 | 184 | 187 |
| 1966 | 4 | 12 | NA | 22 | 47 | 1 | 40 | 7 | 35 | 29 | 194 | 198 |
| 1967 | 73 | 12 | 5 | 25 | 51 | 2 | 45 | 8 | 60 | 31 | 234 | 307 |
| 1968 | 5 | 4 | 7 | 29 | 49 | 1 | 53 | 8 | 55 | 27 | 226 | 231 |
| 1969 | 4 | 3 | 7 | 35 | 45 | 2 | 63 | 11 | 46 | 24 | 229 | 233 |
| 1970 | 14 | 2 | 6 | 27 | 44 | 2 | 84 | 10 | 54 | 21 | 245 | 259 |
| 1971 | 1 | 8 | 13 | 26 | 43 | 5 | 74 | 14 | 36 | 17 | 223 | 224 |
| 1972 | 1 | 3 | 18 | 31 | 41 | 1 | 85 | 13 | 33 | 15 | 222 | 222 |
| 1973 | 2 | 9 | 15 | 27 | 35 | 4 | 96 | 19 | 23 | 16 | 229 | 231 |
| 1974 | 3 | 2 | 14 | 25 | 33 | 2 | 113 | 15 | 14 | 14 | 218 | 221 |
| 1975 | 6 | 1 | 13 | 26 | 25 | 2 | 102 | 22 | 15 | 11 | 204 | 209 |
| 1976 | 8 | 1 | 13 | 25 | 26 | 3 | 103 | 30 | 12 | 15 | 215 | 223 |
| 1977 | 50 | 1 | 10 | 18 | 26 | 2 | 102 | 24 | 6 | 12 | 193 | 243 |
| 1978 | 158 | 3 | 9 | 20 | 27 | 1 | 111 | 23 | 13 | 6 | 204 | 362 |
| 1979 | 235 | 3 | 8 | 15 | 23 | (s) | 146 | 31 | 9 | 9 | 236 | 471 |
| 1980 | 287 | 3 | 10 | 21 | 23 | 1 | 136 | 29 | 33 | 10 | 258 | 544 |
| 1981 | 228 | 5 | 18 | 42 | 19 | 2 | 138 | 26 | 118 | 17 | 367 | 595 |
| 1982 | 236 | 74 | 31 | 65 | 16 | 20 | 156 | 24 | 209 | 15 | 579 | 815 |
| 1983 | 164 | 64 | 43 | 73 | 16 | 10 | 195 | 20 | 185 | 12 | 575 | 739 |
| 1984 | 181 | 51 | 30 | 48 | 15 | 6 | 193 | 21 | 190 | 17 | 541 | 722 |
| 1985 | 204 | 67 | 48 | 62 | 15 | 10 | 187 | 19 | 197 | 19 | 577 | 781 |
| 1986 | 154 | 100 | 28 | 42 | 23 | 33 | 238 | 22 | 147 | 26 | 631 | 785 |
| 1987 | 151 | 66 | 24 | 38 | 23 | 35 | 213 | 20 | 186 | 33 | 613 | 764 |
| 1988 | 155 | 69 | 31 | 49 | 26 | 22 | 231 | 23 | 200 | 41 | 661 | 815 |
| 1989 | 142 | 97 | 24 | 35 | 19 | 39 | 233 | 26 | 215 | 54 | 717 | 859 |
| 1990 | 109 | 109 | 28 | 40 | 20 | 55 | 220 | 26 | 211 | 67 | 748 | 857 |
| 1991 | 116 | 215 | 28 | 41 | 18 | 82 | 235 | 0 | 226 | 67 | 885 | 1,001 |
| 1992 | 89 | 219 | 33 | 49 | 16 | 96 | 216 | 0 | 193 | 73 | 861 | 950 |
| 1993 | 98 | 274 | 26 | 43 | 19 | 105 | 258 | 0 | 123 | 83 | 904 | 1,003 |
| 1994 | 99 | 234 | 24 | 38 | 22 | 97 | 261 | 0 | 125 | 66 | 843 | 942 |
| 1995[P] | 95 | 183 | 38 | 58 | 25 | 104 | 277 | 0 | 136 | 72 | 855 | 949 |

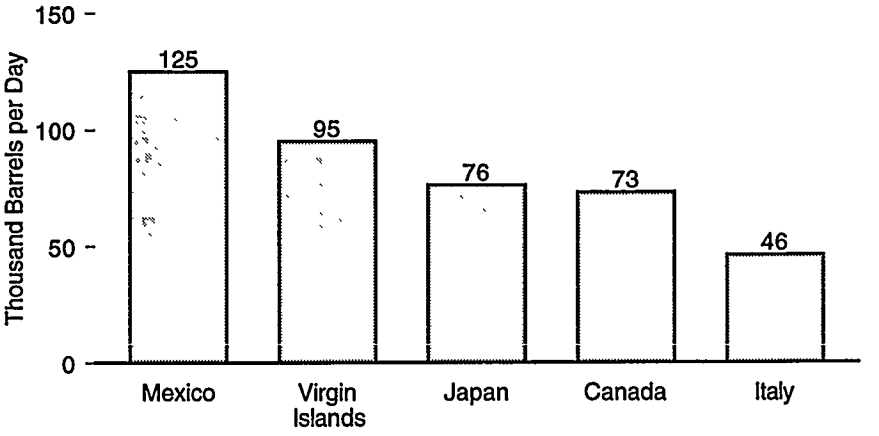
[1] Includes propylene.
[2] Includes aviation gasoline for the years 1949-1963.
[3] Aviation gasoline (for 1964 forward), motor gasoline blending components, jet fuel, kerosene, special naphthas, wax, asphalt, road oil, pentanes plus, and miscellaneous products.
P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.
Notes: • Includes exports to U.S. possessions and territories. • Totals may not equal sum of components due to independent rounding.
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.6 Petroleum Exports by Country of Destination

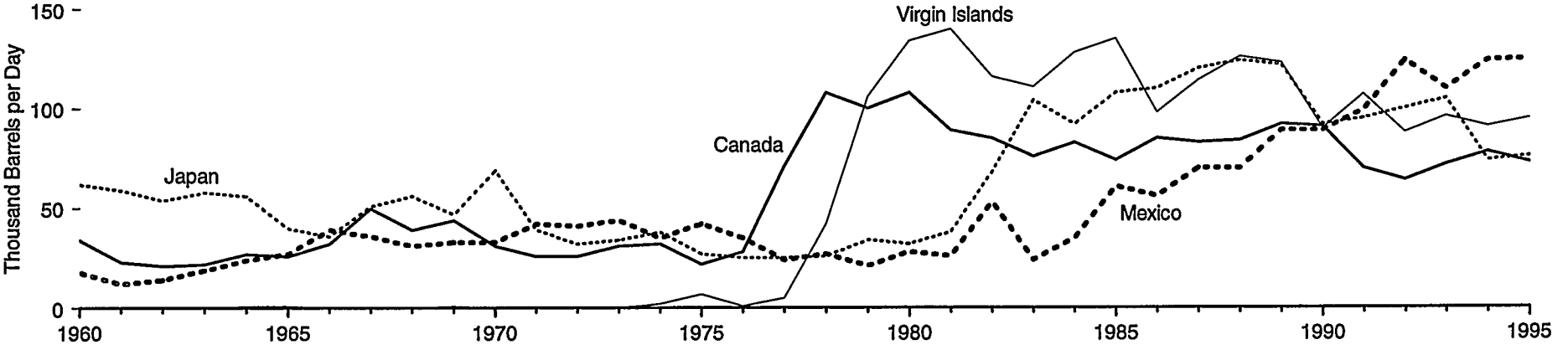
**Total Exports and Exports to Canada and Mexico, 1960-1995**




**By Selected Countries, 1995**




**By Selected Countries, 1960-1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.6.

# Table 5.6 Petroleum Exports by Country of Destination, 1960-1995

(Thousand Barrels per Day)

| Year | Canada | Mexico | Japan | Netherlands | Belgium [1] | Italy | United Kingdom | France | Brazil | Puerto Rico | Virgin Islands | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | 34 | 18 | 62 | 6 | 3 | 6 | 12 | 4 | 4 | 1 | NA | 52 | 202 |
| 1961 | 23 | 12 | 59 | 4 | 4 | 5 | 10 | 4 | 4 | 1 | (s) | 48 | 174 |
| 1962 | 21 | 14 | 54 | 5 | 3 | 5 | 8 | 3 | 5 | 1 | (s) | 50 | 168 |
| 1963 | 22 | 19 | 58 | 13 | 9 | 8 | 11 | 4 | 4 | 1 | (s) | 59 | 208 |
| 1964 | 27 | 24 | 56 | 9 | 4 | 8 | 10 | 4 | 4 | 1 | 1 | 55 | 202 |
| 1965 | 26 | 27 | 40 | 10 | 3 | 7 | 12 | 3 | 3 | 1 | 1 | 54 | 187 |
| 1966 | 32 | 39 | 36 | 9 | 3 | 7 | 12 | 4 | 4 | 3 | (s) | 49 | 198 |
| 1967 | 50 | 36 | 51 | 13 | 5 | 9 | 62 | 3 | 6 | 7 | (s) | 65 | 307 |
| 1968 | 39 | 31 | 56 | 10 | 4 | 8 | 14 | 4 | 8 | 2 | (s) | 55 | 231 |
| 1969 | 44 | 33 | 47 | 9 | 4 | 9 | 13 | 4 | 7 | 2 | 1 | 59 | 233 |
| 1970 | 31 | 33 | 69 | 15 | 5 | 10 | 12 | 5 | 7 | 1 | (s) | 71 | 259 |
| 1971 | 26 | 42 | 39 | 11 | 7 | 8 | 9 | 5 | 9 | 3 | (s) | 67 | 224 |
| 1972 | 26 | 41 | 32 | 12 | 13 | 9 | 10 | 5 | 9 | 3 | (s) | 63 | 222 |
| 1973 | 31 | 44 | 34 | 13 | 15 | 9 | 9 | 5 | 8 | 3 | (s) | 60 | 231 |
| 1974 | 32 | 35 | 38 | 17 | 13 | 9 | 6 | 4 | 9 | 4 | 2 | 52 | 221 |
| 1975 | 22 | 42 | 27 | 23 | 9 | 10 | 7 | 6 | 6 | 5 | 7 | 44 | 209 |
| 1976 | 28 | 35 | 25 | 22 | 12 | 10 | 13 | 6 | 7 | 21 | 1 | 43 | 223 |
| 1977 | 71 | 24 | 25 | 17 | 16 | 10 | 9 | 9 | 6 | 6 | 5 | 44 | 243 |
| 1978 | 108 | 27 | 26 | 18 | 15 | 10 | 7 | 9 | 8 | 44 | 42 | 47 | 362 |
| 1979 | 100 | 21 | 34 | 28 | 19 | 15 | 7 | 13 | 7 | 64 | 106 | 57 | 471 |
| 1980 | 108 | 28 | 32 | 23 | 20 | 14 | 7 | 11 | 4 | 86 | 134 | 79 | 544 |
| 1981 | 89 | 26 | 38 | 42 | 12 | 22 | 5 | 15 | 1 | 81 | 140 | 124 | 595 |
| 1982 | 85 | 53 | 68 | 85 | 17 | 32 | 14 | 24 | 8 | 95 | 116 | 216 | 815 |
| 1983 | 76 | 24 | 104 | 49 | 22 | 35 | 8 | 23 | 2 | 33 | 111 | 251 | 739 |
| 1984 | 83 | 35 | 92 | 37 | 21 | 39 | 14 | 18 | 1 | 24 | 128 | 229 | 722 |
| 1985 | 74 | 61 | 108 | 44 | 26 | 30 | 14 | 11 | 3 | 26 | 135 | 248 | 781 |
| 1986 | 85 | 56 | 110 | 58 | 30 | 39 | 8 | 11 | 3 | 14 | 98 | 273 | 785 |
| 1987 | 83 | 70 | 120 | 39 | 17 | 42 | 6 | 12 | 2 | 22 | 114 | 236 | 764 |
| 1988 | 84 | 70 | 124 | 26 | 25 | 29 | 9 | 12 | 3 | 21 | 126 | 286 | 815 |
| 1989 | 92 | 89 | 122 | 36 | 23 | 37 | 9 | 11 | 5 | 18 | 123 | 294 | 859 |
| 1990 | 91 | 89 | 92 | 54 | 20 | 48 | 11 | 17 | 2 | 11 | 90 | 332 | 857 |
| 1991 | 70 | 99 | 95 | 72 | 22 | 55 | 13 | 27 | 13 | 10 | 107 | 418 | 1,001 |
| 1992 | 64 | 124 | 100 | 52 | 22 | 38 | 12 | 9 | 20 | 7 | 88 | 415 | 950 |
| 1993 | 72 | 110 | 105 | 45 | 21 | 34 | 10 | 8 | 16 | 12 | 96 | 474 | 1,003 |
| 1994 | 78 | 124 | 74 | 30 | 26 | 35 | 10 | 11 | 15 | 12 | 91 | 435 | 942 |
| 1995[P] | 73 | 125 | 76 | 33 | 21 | 46 | 14 | 11 | 16 | 28 | 95 | 412 | 949 |

[1] Including Luxembourg.

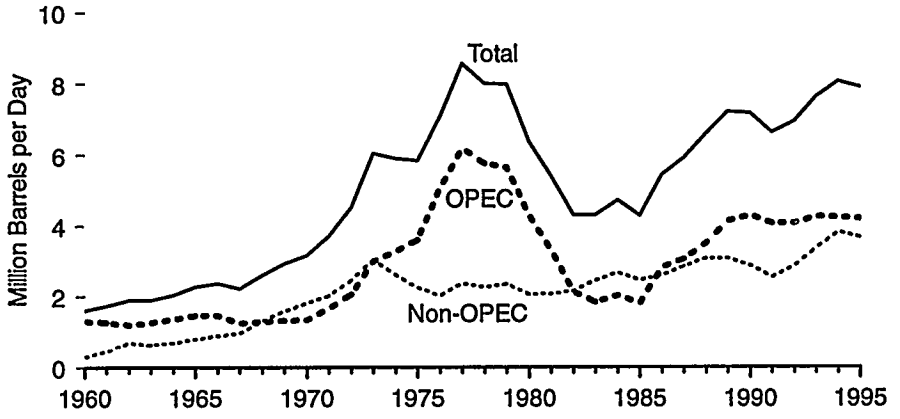
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 barrels per day.

Note: Totals may not equal sum of components due to independent rounding.

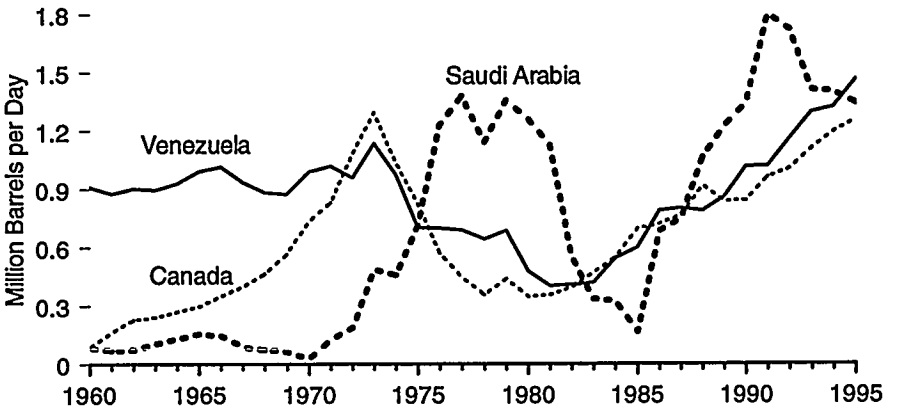
Sources: • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.7 Petroleum Net Imports by Country of Origin, 1960-1995

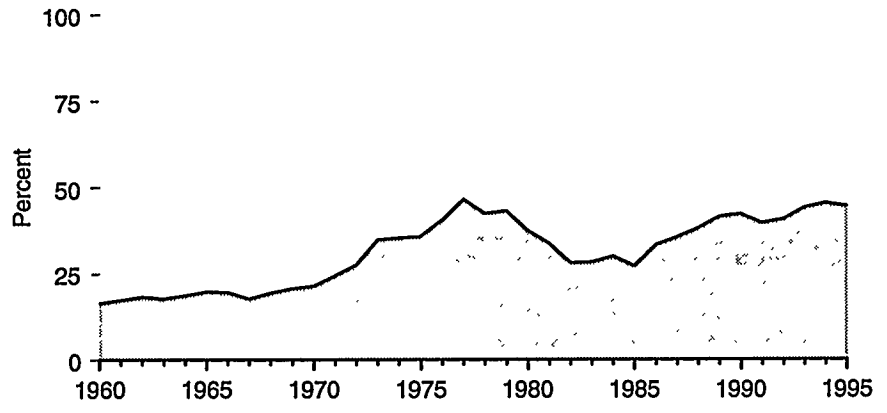
**Total, OPEC, and Non-OPEC**



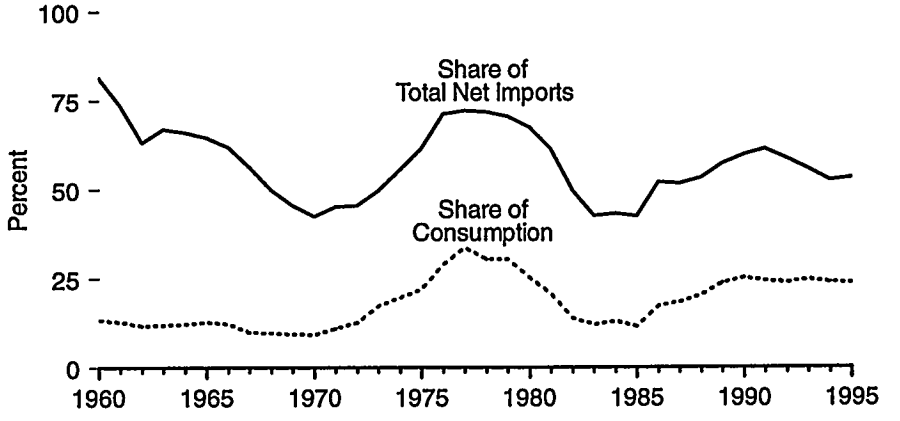

**By Selected Country**




**Share of Consumption**




**Net Imports from OPEC**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.7.

# Table 5.7 Petroleum Net Imports by Country of Origin, 1960-1995

| Year | OPEC [1] | | | | | | Non-OPEC | | | | | Total Net Imports | Total Net Imports as Share of Consumption [5] | Net Imports from OPEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nigeria | Saudi Arabia | Venezuela | Other [2] | Total [3] | Arab OPEC [4] | Canada | Mexico | United Kingdom | Virgin Islands and Puerto Rico | Other | | | Share of Total Net Imports [6] | Share of Consumption [7] |
| | Thousand Barrels per Day | | | | | | | | | | | | Percent | | |
| 1960 | 0 | 84 | 910 | 317 | 1,311 | 292 | 86 | -2 | -12 | 34 | 195 | 1,613 | 16.5 | 81.3 | 13.4 |
| 1961 | 0 | 73 | 878 | 333 | 1,283 | 284 | 167 | 27 | -10 | 42 | 232 | 1,743 | 17.5 | 73.6 | 12.9 |
| 1962 | 0 | 74 | 905 | 232 | 1,210 | 241 | 229 | 35 | -6 | 40 | 405 | 1,913 | 18.4 | 63.3 | 11.6 |
| 1963 | 0 | 108 | 899 | 274 | 1,282 | 258 | 243 | 29 | -7 | 43 | 325 | 1,915 | 17.8 | 67.0 | 11.9 |
| 1964 | 0 | 131 | 932 | 296 | 1,359 | 293 | 272 | 23 | -9 | 45 | 368 | 2,057 | 18.7 | 66.1 | 12.3 |
| 1965 | 15 | 158 | 994 | 308 | 1,475 | 324 | 297 | 21 | -11 | 45 | 454 | 2,281 | 19.8 | 64.7 | 12.8 |
| 1966 | 11 | 147 | 1,018 | 295 | 1,470 | 291 | 352 | 6 | -6 | 58 | 494 | 2,375 | 19.7 | 61.9 | 12.2 |
| 1967 | 5 | 92 | 937 | 224 | 1,258 | 177 | 400 | 13 | -51 | 89 | 521 | 2,230 | 17.8 | 56.4 | 10.0 |
| 1968 | 9 | 74 | 886 | 332 | 1,302 | 272 | 468 | 15 | 13 | 143 | 668 | 2,609 | 19.5 | 49.9 | 9.7 |
| 1969 | 49 | 65 | 875 | 346 | 1,336 | 276 | 564 | 10 | 7 | 186 | 831 | 2,933 | 20.8 | 45.5 | 9.5 |
| 1970 | 50 | 30 | 989 | 274 | 1,343 | 196 | 736 | 9 | -1 | 270 | 804 | 3,161 | 21.5 | 42.5 | 9.1 |
| 1971 | 102 | 128 | 1,019 | 422 | 1,671 | 327 | 831 | -14 | 1 | 365 | 848 | 3,701 | 24.3 | 45.2 | 11.0 |
| 1972 | 251 | 189 | 959 | 662 | 2,061 | 529 | 1,082 | -20 | -1 | 428 | 969 | 4,519 | 27.6 | 45.6 | 12.6 |
| 1973 | 459 | 485 | 1,134 | 913 | 2,991 | 914 | 1,294 | -28 | (s) | 426 | 1,343 | 6,025 | 34.8 | 49.6 | 17.3 |
| 1974 | 713 | 461 | 978 | 1,125 | 3,277 | 752 | 1,038 | -27 | 1 | 475 | 1,127 | 5,892 | 35.4 | 55.6 | 19.7 |
| 1975 | 762 | 714 | 702 | 1,421 | 3,599 | 1,382 | 824 | 29 | 7 | 484 | 904 | 5,846 | 35.8 | 61.6 | 22.1 |
| 1976 | 1,025 | 1,229 | 699 | 2,110 | 5,063 | 2,423 | 571 | 53 | 24 | 488 | 891 | 7,090 | 40.6 | 71.4 | 29.0 |
| 1977 | 1,143 | 1,379 | 689 | 2,978 | 6,190 | 3,184 | 446 | 155 | 117 | 560 | 1,097 | 8,565 | 46.5 | 72.3 | 33.6 |
| 1978 | 919 | 1,142 | 644 | 3,042 | 5,747 | 2,962 | 359 | 291 | 173 | 436 | 996 | 8,002 | 42.5 | 71.8 | 30.5 |
| 1979 | 1,080 | 1,354 | 688 | 2,510 | 5,633 | 3,054 | 438 | 418 | 196 | 353 | 948 | 7,985 | 43.1 | 70.5 | 30.4 |
| 1980 | 857 | 1,259 | 478 | 1,699 | 4,293 | 2,549 | 347 | 506 | 169 | 256 | 794 | 6,365 | 37.3 | 67.5 | 25.2 |
| 1981 | 620 | 1,128 | 403 | 1,165 | 3,315 | 1,844 | 358 | 497 | 370 | 169 | 693 | 5,401 | 33.6 | 61.4 | 20.6 |
| 1982 | 512 | 551 | 409 | 663 | 2,136 | 852 | 397 | 632 | 442 | 154 | 538 | 4,298 | 28.1 | 49.7 | 14.0 |
| 1983 | 299 | 336 | 420 | 788 | 1,843 | 630 | 471 | 802 | 374 | 178 | 644 | 4,312 | 28.3 | 42.7 | 12.1 |
| 1984 | 215 | 324 | 544 | 953 | 2,037 | 817 | 547 | 714 | 388 | 184 | 847 | 4,715 | 30.0 | 43.2 | 13.0 |
| 1985 | 293 | 167 | 602 | 759 | 1,821 | 470 | 696 | 755 | 295 | 114 | 605 | 4,286 | 27.3 | 42.5 | 11.6 |
| 1986 | 440 | 685 | 788 | 915 | 2,828 | 1,160 | 721 | 642 | 342 | 152 | 753 | 5,439 | 33.4 | 52.0 | 17.4 |
| 1987 | 535 | 751 | 801 | 968 | 3,055 | 1,273 | 765 | 585 | 346 | 158 | 1,006 | 5,914 | 35.5 | 51.7 | 18.3 |
| 1988 | 618 | 1,064 | 790 | 1,041 | 3,513 | 1,837 | 916 | 677 | 306 | 117 | 1,058 | 6,587 | 38.1 | 53.3 | 20.3 |
| 1989 | 815 | 1,224 | 861 | 1,224 | 4,124 | 2,128 | 839 | 678 | 206 | 212 | 1,143 | 7,202 | 41.6 | 57.3 | 23.8 |
| 1990 | 800 | 1,339 | 1,016 | 1,130 | 4,285 | 2,243 | 843 | 666 | 179 | 213 | 976 | 7,161 | 42.2 | 59.8 | 25.2 |
| 1991 | 703 | 1,796 | 1,020 | 546 | 4,065 | 2,057 | 963 | 707 | 125 | 153 | 612 | 6,626 | 39.6 | 61.3 | 24.3 |
| 1992 | 680 | 1,720 | 1,161 | 510 | 4,071 | 1,972 | 1,005 | 706 | 219 | 180 | 757 | 6,938 | 40.7 | 58.7 | 23.9 |
| 1993 | 736 | 1,413 | 1,296 | 808 | 4,253 | 1,995 | 1,109 | 809 | 340 | 175 | 932 | 7,618 | 44.2 | 55.8 | 24.7 |
| 1994 | 637 | R1,402 | R1,322 | 871 | R4,233 | 1,968 | R1,194 | R860 | 448 | R246 | R1,074 | R8,054 | R45.5 | R52.6 | R23.9 |
| 1995P | 623 | 1,344 | 1,463 | 774 | 4,204 | 1,800 | 1,258 | 944 | 370 | 170 | 936 | 7,883 | 44.5 | 53.3 | 23.7 |

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Qatar, United Arab Emirates, and, through 1992, Ecuador, which withdrew from OPEC on December 31, 1992. Beginning with 1993, net imports from Ecuador are included in the Non-OPEC "Other" column. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[3] Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[4] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

[5] Calculated by dividing total net petroleum imports by total U.S. petroleum products supplied (consumption).

[6] Calculated by dividing net petroleum imports from OPEC countries by total net petroleum imports.

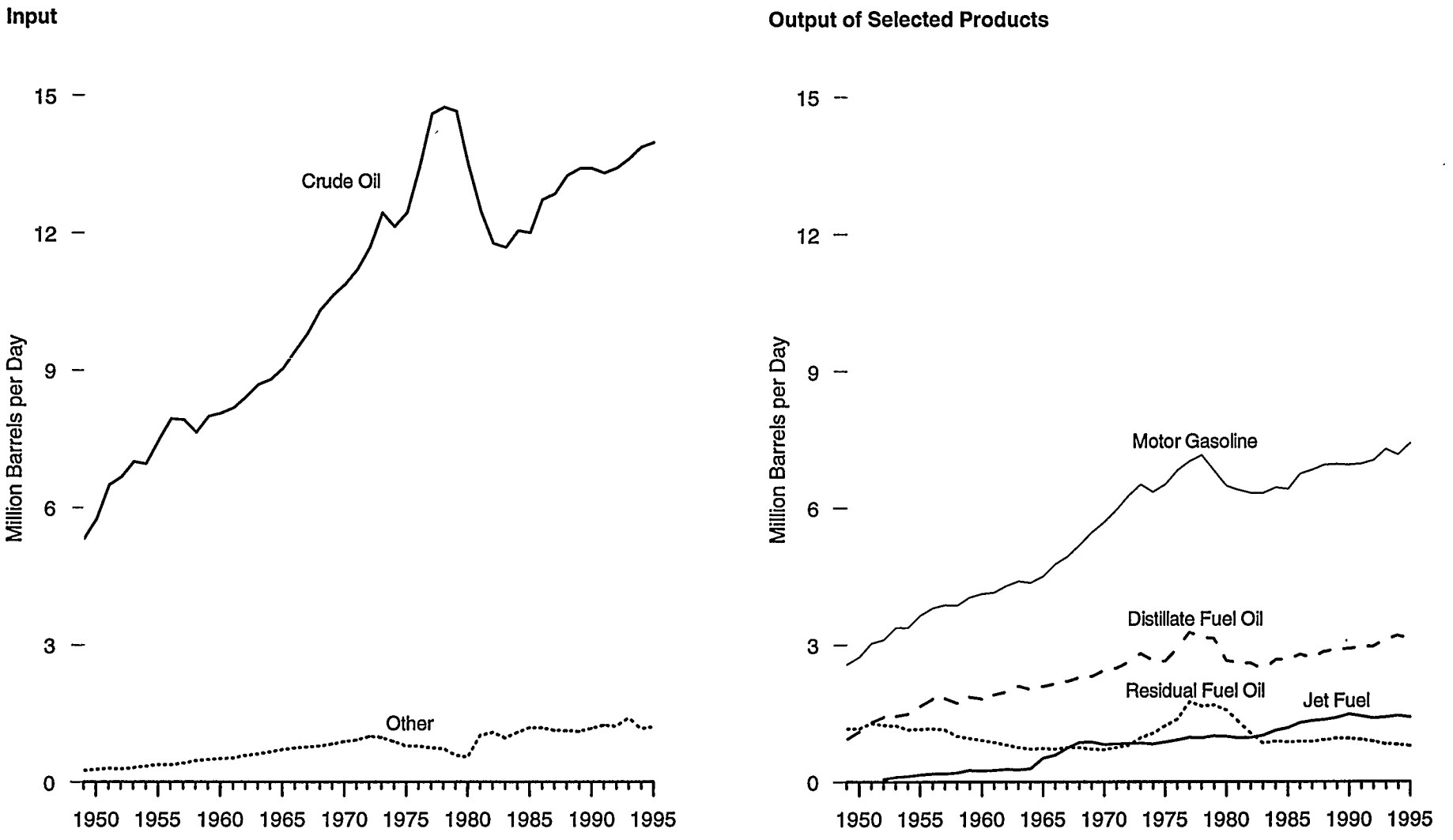
[7] Calculated by dividing net petroleum imports from OPEC countries by total U.S. petroleum product supplied (consumption).

R=Revised data. P=Preliminary data. (s)=Less than 500 barrels per day.

Notes: • Net imports are imports minus exports; negative numbers indicate that exports exceed imports. • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Sources: • 1960-1975—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *P.A.D. Districts Supply/Demand, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.8 Refinery Input and Output, 1949-1995




Source: Table 5.8

# Table 5.8 Refinery Input and Output, 1949-1995

(Million Barrels per Day)

| Year | Input | | | | Output | | | | | | | Processing Gain |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Crude Oil | Natural Gas Plant Liquids | Other Liquids [1] | Total Input | Motor Gasoline [2] | Jet Fuel [2] | Distillate Fuel Oil | Residual Fuel Oil | Liquefied Petroleum Gases | Other Products [3] | Total Output | |
| 1949 | 5.33 | 0.23 | 0.03 | 5.59 | 2.57 | NA | 0.93 | 1.16 | 0.06 | 0.85 | 5.59 | (s) |
| 1950 | 5.74 | 0.26 | 0.02 | 6.02 | 2.74 | NA | 1.09 | 1.16 | 0.08 | 0.95 | 6.02 | (s) |
| 1951 | 6.49 | 0.27 | 0.03 | 6.80 | 3.04 | NA | 1.30 | 1.29 | 0.09 | 1.09 | 6.80 | 0.01 |
| 1952 | 6.67 | 0.28 | 0.01 | 6.97 | 3.12 | 0.06 | 1.42 | 1.24 | 0.08 | 1.06 | 6.97 | 0.01 |
| 1953 | 7.00 | 0.30 | (s) | 7.31 | 3.38 | 0.10 | 1.45 | 1.23 | 0.09 | 1.08 | 7.33 | 0.02 |
| 1954 | 6.96 | 0.32 | 0.02 | 7.30 | 3.38 | 0.13 | 1.49 | 1.14 | 0.09 | 1.10 | 7.32 | 0.02 |
| 1955 | 7.48 | 0.34 | 0.03 | 7.86 | 3.65 | 0.16 | 1.65 | 1.15 | 0.12 | 1.17 | 7.89 | 0.03 |
| 1956 | 7.94 | 0.37 | 0.01 | 8.32 | 3.82 | 0.18 | 1.82 | 1.17 | 0.14 | 1.24 | 8.36 | 0.04 |
| 1957 | 7.92 | 0.41 | (s) | 8.33 | 3.88 | 0.17 | 1.83 | 1.14 | 0.15 | 1.20 | 8.37 | 0.04 |
| 1958 | 7.64 | 0.37 | 0.09 | 8.11 | 3.87 | 0.20 | 1.73 | 1.00 | 0.16 | 1.22 | 8.17 | 0.06 |
| 1959 | 7.99 | 0.42 | 0.07 | 8.48 | 4.04 | 0.25 | 1.86 | 0.95 | 0.19 | 1.28 | 8.57 | 0.09 |
| 1960 | 8.07 | 0.45 | 0.06 | 8.58 | 4.13 | 0.24 | 1.82 | 0.91 | 0.21 | 1.42 | 8.73 | 0.15 |
| 1961 | 8.18 | 0.46 | 0.06 | 8.71 | 4.15 | 0.26 | 1.91 | 0.86 | 0.22 | 1.49 | 8.89 | 0.18 |
| 1962 | 8.41 | 0.50 | 0.08 | 8.99 | 4.30 | 0.28 | 1.97 | 0.81 | 0.21 | 1.59 | 9.16 | 0.18 |
| 1963 | 8.69 | 0.52 | 0.09 | 9.30 | 4.39 | 0.27 | 2.09 | 0.76 | 0.26 | 1.72 | 9.50 | 0.20 |
| 1964 | 8.81 | 0.58 | 0.07 | 9.46 | 4.37 | 0.29 | 2.03 | 0.73 | 0.29 | 1.97 | 9.68 | 0.22 |
| 1965 | 9.04 | 0.62 | 0.09 | 9.75 | 4.51 | 0.52 | 2.10 | 0.74 | 0.29 | 1.81 | 9.97 | 0.22 |
| 1966 | 9.44 | 0.65 | 0.09 | 10.18 | 4.77 | 0.59 | 2.15 | 0.72 | 0.29 | 1.90 | 10.43 | 0.25 |
| 1967 | 9.82 | 0.67 | 0.09 | 10.58 | 4.94 | 0.75 | 2.20 | 0.76 | 0.31 | 1.92 | 10.87 | 0.29 |
| 1968 | 10.31 | 0.71 | 0.08 | 11.10 | 5.20 | 0.86 | 2.29 | 0.75 | 0.32 | 1.99 | 11.42 | 0.32 |
| 1969 | 10.63 | 0.72 | 0.11 | 11.46 | 5.47 | 0.88 | 2.32 | 0.73 | 0.34 | 2.06 | 11.79 | 0.34 |
| 1970 | 10.87 | 0.76 | 0.12 | 11.75 | 5.70 | 0.83 | 2.45 | 0.71 | 0.35 | 2.08 | 12.11 | 0.36 |
| 1971 | 11.20 | 0.78 | 0.14 | 12.12 | 5.97 | 0.83 | 2.50 | 0.75 | 0.36 | 2.09 | 12.50 | 0.38 |
| 1972 | 11.70 | 0.83 | 0.17 | 12.69 | 6.28 | 0.85 | 2.63 | 0.80 | 0.36 | 2.17 | 13.08 | 0.39 |
| 1973 | 12.43 | 0.82 | 0.15 | 13.40 | 6.53 | 0.86 | 2.82 | 0.97 | 0.37 | 2.30 | 13.85 | 0.45 |
| 1974 | 12.13 | 0.75 | 0.14 | 13.02 | 6.36 | 0.84 | 2.67 | 1.07 | 0.34 | 2.23 | 13.50 | 0.48 |
| 1975 | 12.44 | 0.71 | 0.07 | 13.23 | 6.52 | 0.87 | 2.65 | 1.24 | 0.31 | 2.10 | 13.68 | 0.46 |
| 1976 | 13.42 | 0.73 | 0.06 | 14.20 | 6.84 | 0.92 | 2.92 | 1.38 | 0.34 | 2.28 | 14.68 | 0.48 |
| 1977 | 14.60 | 0.67 | 0.07 | 15.35 | 7.03 | 0.97 | 3.28 | 1.75 | 0.35 | 2.49 | 15.87 | 0.52 |
| 1978 | 14.74 | 0.64 | 0.09 | 15.47 | 7.17 | 0.97 | 3.17 | 1.67 | 0.35 | 2.64 | 15.97 | 0.50 |
| 1979 | 14.65 | 0.51 | 0.08 | 15.24 | 6.84 | 1.01 | 3.15 | 1.69 | 0.34 | 2.74 | 15.76 | 0.53 |
| 1980 | 13.48 | 0.46 | 0.08 | 14.02 | 6.49 | 1.00 | 2.66 | 1.58 | 0.33 | 2.56 | 14.62 | 0.60 |
| 1981 | 12.47 | 0.52 | 0.49 | 13.48 | 6.40 | 0.97 | 2.61 | 1.32 | 0.31 | 2.37 | 13.99 | 0.51 |
| 1982 | 11.77 | 0.52 | 0.57 | 12.86 | 6.34 | 0.98 | 2.61 | 1.07 | 0.27 | 2.13 | 13.39 | 0.53 |
| 1983 | 11.69 | 0.46 | 0.50 | 12.65 | 6.34 | 1.02 | 2.46 | 0.85 | 0.33 | 2.14 | 13.14 | 0.49 |
| 1984 | 12.04 | 0.50 | 0.58 | 13.13 | 6.45 | 1.13 | 2.68 | 0.89 | 0.36 | 2.16 | 13.68 | 0.55 |
| 1985 | 12.00 | 0.51 | 0.68 | 13.19 | 6.42 | 1.19 | 2.69 | 0.88 | 0.39 | 2.18 | 13.75 | 0.56 |
| 1986 | 12.72 | 0.48 | 0.71 | 13.91 | 6.75 | 1.29 | 2.80 | 0.89 | 0.42 | 2.37 | 14.52 | 0.62 |
| 1987 | 12.85 | 0.47 | 0.67 | 13.99 | 6.84 | 1.34 | 2.73 | 0.89 | 0.45 | 2.38 | 14.63 | 0.64 |
| 1988 | 13.25 | 0.51 | 0.61 | 14.37 | 6.96 | 1.37 | 2.86 | 0.93 | 0.50 | 2.42 | 15.02 | 0.66 |
| 1989 | 13.40 | 0.50 | 0.61 | 14.51 | 6.96 | 1.40 | 2.90 | 0.95 | 0.55 | 2.40 | 15.17 | 0.66 |
| 1990 | 13.41 | 0.47 | 0.71 | 14.59 | 6.96 | 1.49 | 2.92 | 0.95 | 0.50 | 2.45 | 15.27 | 0.68 |
| 1991 | 13.30 | 0.47 | 0.77 | 14.54 | 6.98 | 1.44 | 2.96 | 0.93 | 0.54 | 2.41 | 15.26 | 0.71 |
| 1992 | 13.41 | 0.47 | 0.75 | 14.63 | 7.06 | 1.40 | 2.97 | 0.89 | 0.61 | 2.47 | 15.40 | 0.77 |
| 1993 | 13.61 | 0.49 | 0.92 | 15.02 | 7.30 | 1.42 | 3.13 | 0.84 | 0.59 | 2.50 | 15.79 | 0.77 |
| 1994 | 13.87 | R0.47 | R0.69 | 15.02 | 7.18 | 1.45 | R3.20 | R0.83 | 0.61 | R2.52 | R15.79 | R0.77 |
| 1995P | 13.97 | 0.47 | 0.74 | 15.18 | 7.43 | 1.41 | 3.15 | 0.79 | 0.65 | 2.51 | 15.95 | 0.77 |

[1] Prior to 1981, included unfinished oils (net), hydrogen, and hydrocarbons not included elsewhere; 1981 forward, included unfinished oils (net), motor gasoline blending components (net), aviation gasoline blending components (net), hydrogen, other hydrocarbons, and alcohol. See Note 1 at end of section.

[2] Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas. Prior to 1965, kerosene-type jet fuel was included in kerosene.

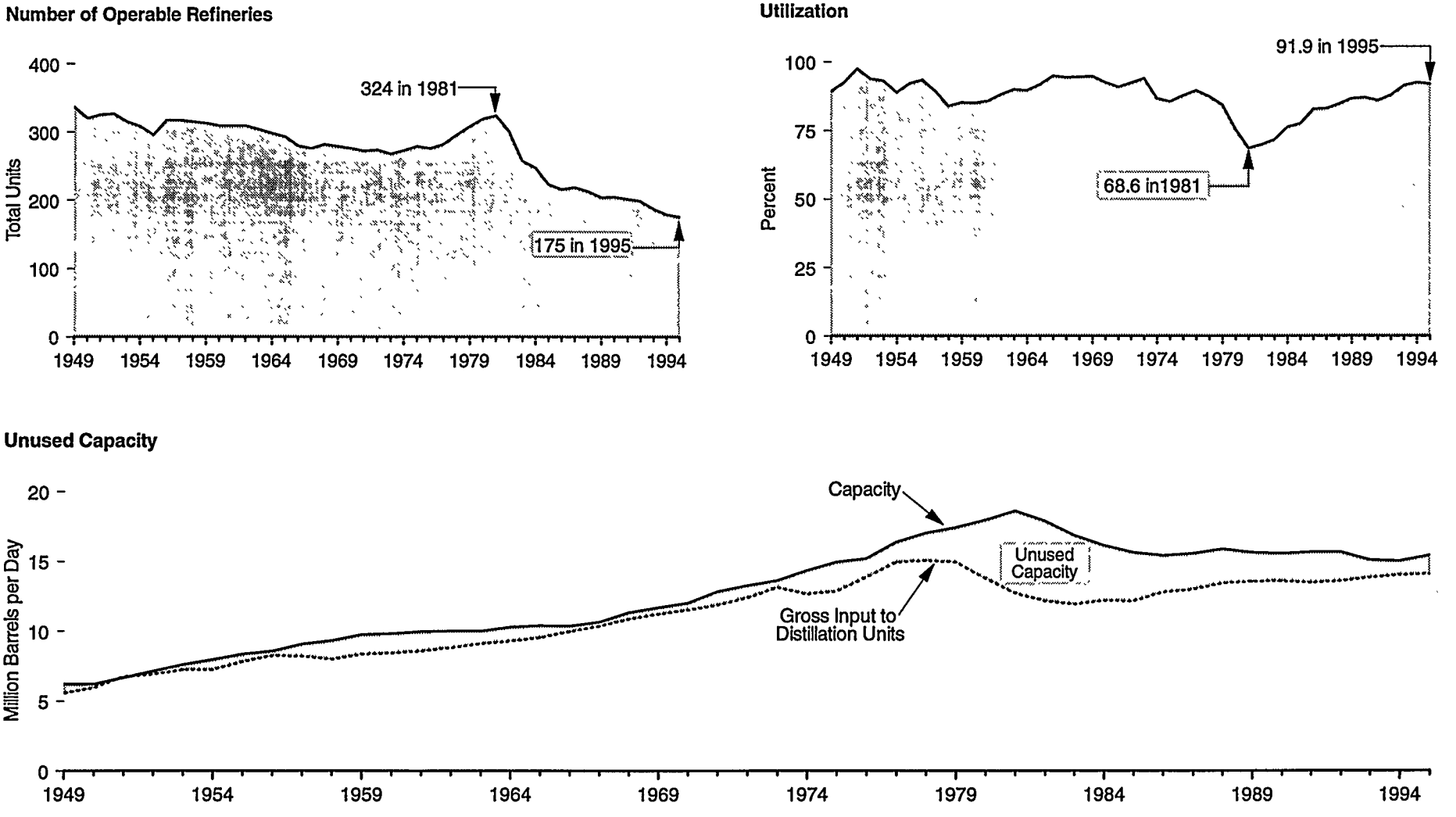
[3] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, still gas, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included.

R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 5,000 barrels per day.

Note: Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.9 Refinery Capacity and Utilization, 1949-1995




Source: Table 5.9.

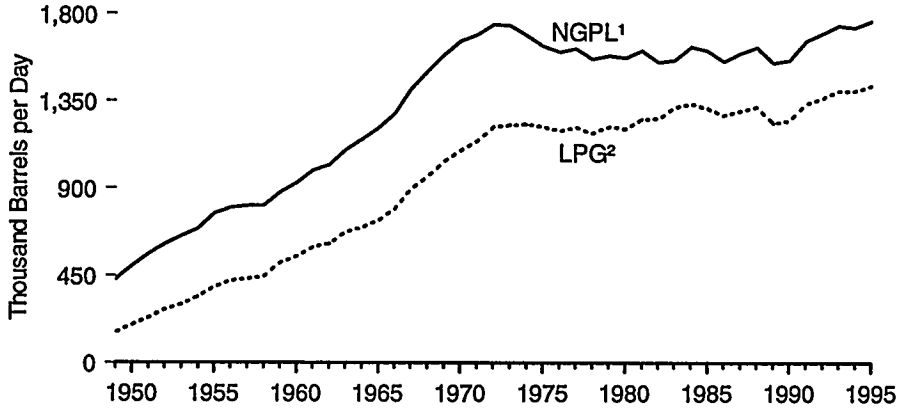
# Table 5.9 Refinery Capacity and Utilization, 1949-1995

| Year | Operable Refineries | | Gross Input to Distillation Units [2] (million barrels per day) | Utilization [3] (percent) |
|---|---|---|---|---|
| | Number [4] | Capacity [1] (million barrels per day) | | |
| 1949 | 336 | 6.23 | 5.56 | 89.2 |
| 1950 | 320 | 6.22 | 5.98 | 92.5 |
| 1951 | 325 | 6.70 | 6.76 | 97.5 |
| 1952 | 327 | 7.16 | 6.93 | 93.8 |
| 1953 | 315 | 7.62 | 7.26 | 93.1 |
| 1954 | 308 | 7.98 | 7.27 | 88.8 |
| 1955 | 296 | 8.39 | 7.82 | 92.2 |
| 1956 | 317 | 8.58 | 8.25 | 93.5 |
| 1957 | 317 | 9.07 | 8.22 | 89.2 |
| 1958 | 315 | 9.36 | 8.02 | 83.9 |
| 1959 | 313 | 9.76 | 8.36 | 85.2 |
| 1960 | 309 | 9.84 | 8.44 | 85.1 |
| 1961 | 309 | 10.00 | 8.57 | 85.7 |
| 1962 | 309 | 10.01 | 8.83 | 88.2 |
| 1963 | 304 | 10.01 | 9.14 | 90.0 |
| 1964 | 298 | 10.31 | 9.28 | 89.6 |
| 1965 | 293 | 10.42 | 9.56 | 91.8 |
| 1966 | 280 | 10.39 | 9.99 | 94.9 |
| 1967 | 276 | 10.66 | 10.39 | 94.4 |
| 1968 | 282 | 11.35 | 10.89 | 94.5 |
| 1969 | 279 | 11.70 | 11.25 | 94.8 |
| 1970 | 276 | 12.02 | 11.52 | 92.6 |
| 1971 | 272 | 12.86 | 11.88 | 90.9 |
| 1972 | 274 | 13.29 | 12.43 | 92.3 |
| 1973 | 268 | 13.64 | 13.15 | 93.9 |
| 1974 | 273 | 14.36 | 12.69 | 86.6 |
| 1975 | 279 | 14.96 | 12.90 | 85.5 |
| 1976 | 276 | 15.24 | 13.88 | 87.8 |
| 1977 | 282 | 16.40 | 14.98 | 89.6 |
| 1978 | 296 | 17.05 | 15.07 | 87.4 |
| 1979 | 308 | 17.44 | 14.96 | 84.4 |
| 1980 | 319 | 17.99 | 13.80 | 75.4 |
| 1981 | 324 | 18.62 | 12.75 | 68.6 |
| 1982 | 301 | 17.89 | 12.17 | 69.9 |
| 1983 | 258 | 16.86 | 11.95 | 71.7 |
| 1984 | 247 | 16.14 | 12.22 | 76.2 |
| 1985 | 223 | 15.66 | 12.17 | 77.6 |
| 1986 | 216 | 15.46 | 12.83 | 82.9 |
| 1987 | 219 | 15.57 | 13.00 | 83.1 |
| 1988 | 213 | 15.92 | 13.45 | 84.7 |
| 1989 | 204 | 15.65 | 13.55 | 86.6 |
| 1990 | 205 | 15.57 | 13.61 | 87.1 |
| 1991 | 202 | 15.68 | 13.51 | 86.0 |
| 1992 | 199 | 15.70 | 13.60 | 87.9 |
| 1993 | 187 | 15.12 | 13.85 | 91.5 |
| 1994 | 179 | 15.03 | [R]14.03 | 92.6 |
| 1995[P] | 175 | 15.43 | 14.11 | 91.9 |

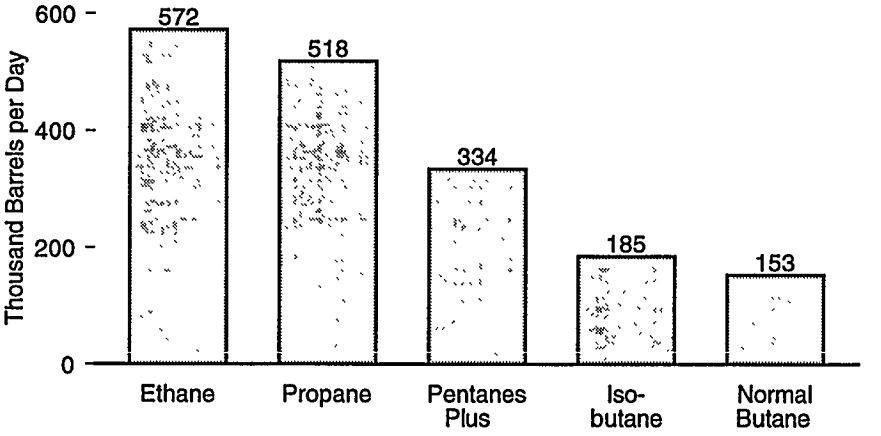
[1] Capacity in million barrels per calendar day on January 1.
[2] See Note 2 at end of section.
[3] For 1949-1980, utilization is derived by dividing gross input to distillation units by one-half of the current year January 1 capacity and the following year January 1 capacity. Percentages were derived from unrounded numbers. For 1981 forward, utilization has been derived by averaging reported monthly utilization.
[4] Prior to 1956, the number of refineries included only those in operation on January 1. For 1957 forward, the number of refineries has included all operable refineries on January 1 (see Glossary).
R=Revised data. P=Preliminary data.
Sources: **Operable Refineries:** • 1949-1961—Bureau of Mines Information Circular, "Petroleum Refineries, Including Cracking Plants in the United States." • 1962-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual.* • 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1982 forward—EIA, *Petroleum Supply Annual.* **Gross Input to Distillation Units:** • 1949-1966—Bureau of Mines, *Minerals Yearbook,* "Natural Gas Liquids" and "Crude Petroleum and Petroleum Products" chapters. • 1967-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual.* • 1978-1980—EIA, Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996). **Utilization:** • 1949-1980—calculated. • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.10 Natural Gas Plant Liquids Production

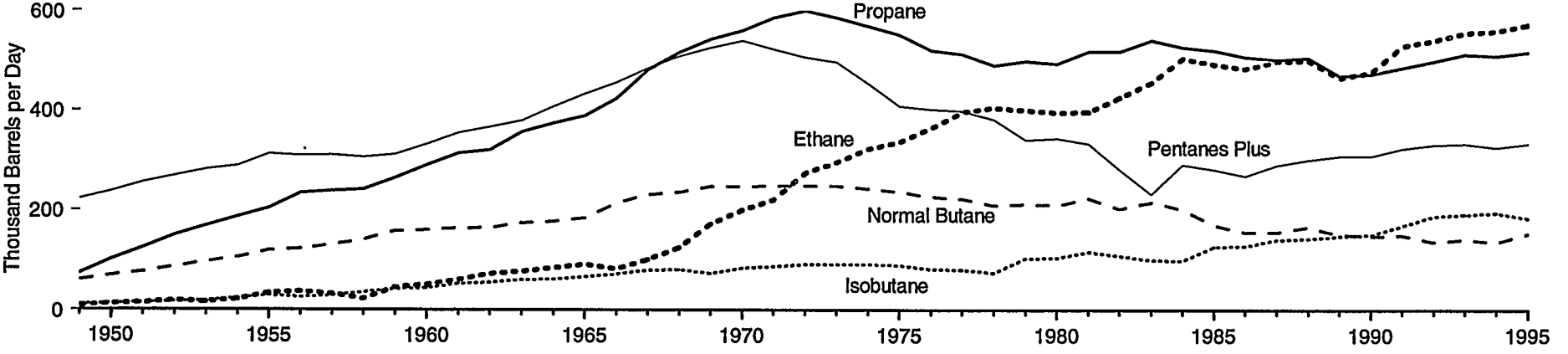
**Total, 1949-1995**




**By Product, 1995**




**By Selected Product, 1949-1995**




¹ Natural gas plant liquids. ² Liquefied petroleum gases.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.10.

# Table 5.10 Natural Gas Plant Liquids Production, 1949-1995

(Thousand Barrels per Day)

| Year | Liquefied Petroleum Gases | | | | | Pentanes Plus [3] | Finished Petroleum Products [4] | Total |
|---|---|---|---|---|---|---|---|---|
| | Ethane [1] | Propane [1,2] | Normal Butane [2] | Isobutane | Total | | | |
| 1949 | 8 | 74 | 61 | 11 | 155 | 223 | 53 | 430 |
| 1950 | 12 | 101 | 69 | 13 | 195 | 238 | 66 | 499 |
| 1951 | 15 | 125 | 77 | 15 | 232 | 256 | 73 | 561 |
| 1952 | 19 | 150 | 86 | 18 | 273 | 269 | 70 | 611 |
| 1953 | 17 | 169 | 97 | 19 | 301 | 282 | 71 | 654 |
| 1954 | 22 | 188 | 106 | 24 | 339 | 290 | 61 | 691 |
| 1955 | 34 | 205 | 120 | 30 | 390 | 313 | 68 | 771 |
| 1956 | 37 | 235 | 123 | 27 | 422 | 310 | 68 | 800 |
| 1957 | 33 | 239 | 132 | 30 | 434 | 311 | 63 | 808 |
| 1958 | 23 | 242 | 141 | 36 | 442 | 307 | 58 | 808 |
| 1959 | 46 | 265 | 159 | 43 | 514 | 312 | 54 | 879 |
| 1960 | 51 | 291 | 161 | 45 | 549 | 333 | 47 | 929 |
| 1961 | 61 | 315 | 164 | 53 | 593 | 355 | 43 | 991 |
| 1962 | 73 | 321 | 165 | 55 | 614 | 367 | 41 | 1,021 |
| 1963 | 78 | 358 | 175 | 61 | 672 | 380 | 47 | 1,098 |
| 1964 | 84 | 375 | 178 | 62 | 699 | 408 | 48 | 1,154 |
| 1965 | 92 | 390 | 185 | 67 | 734 | 434 | 41 | 1,210 |
| 1966 | 82 | 424 | 214 | 73 | 792 | 456 | 37 | 1,284 |
| 1967 | 101 | 482 | 232 | 80 | 895 | 486 | 29 | 1,409 |
| 1968 | 125 | 517 | 236 | 81 | 960 | 509 | 35 | 1,504 |
| 1969 | 173 | 543 | 248 | 74 | 1,037 | 526 | 27 | 1,590 |
| 1970 | 201 | 561 | 248 | 84 | 1,095 | 540 | 25 | 1,660 |
| 1971 | 221 | 586 | 249 | 88 | 1,144 | 523 | 25 | 1,693 |
| 1972 | 275 | 600 | 249 | 92 | 1,215 | 507 | 21 | 1,744 |
| 1973 | 296 | 587 | 249 | 92 | 1,225 | 497 | 16 | 1,738 |
| 1974 | 323 | 569 | 244 | 92 | 1,227 | 454 | 7 | 1,688 |
| 1975 | 337 | 552 | 237 | 90 | 1,217 | 409 | 7 | 1,633 |
| 1976 | 365 | 521 | 227 | 82 | 1,195 | 403 | 6 | 1,604 |
| 1977 | 397 | 513 | 223 | 81 | 1,214 | 399 | 5 | 1,618 |
| 1978 | 406 | 491 | 210 | 75 | 1,182 | 382 | 3 | 1,567 |
| 1979 | 400 | 500 | 212 | 104 | 1,216 | 342 | 26 | 1,584 |
| 1980 | 396 | 494 | 210 | 105 | 1,205 | 345 | 23 | 1,573 |
| 1981 | 397 | 519 | 224 | 117 | 1,256 | 334 | 18 | 1,609 |
| 1982 | 426 | 519 | 204 | 109 | 1,258 | 282 | 11 | 1,550 |
| 1983 | 456 | 541 | 217 | 100 | 1,314 | 233 | 12 | 1,559 |
| 1984 | 505 | 527 | 203 | 99 | 1,334 | 292 | 4 | 1,630 |
| 1985 | 493 | 521 | 171 | 127 | 1,313 | 282 | 14 | 1,609 |
| 1986 | 485 | 508 | 157 | 128 | 1,277 | 269 | 4 | 1,551 |
| 1987 | 499 | 503 | 157 | 141 | 1,300 | 291 | 4 | 1,595 |
| 1988 | 501 | 506 | 167 | 144 | 1,319 | 302 | 4 | 1,625 |
| 1989 | 466 | 471 | 151 | 149 | 1,237 | 309 | (5) | 1,546 |
| 1990 | 477 | 474 | 149 | 151 | 1,250 | 309 | (5) | 1,559 |
| 1991 | 530 | 487 | 150 | 169 | 1,336 | 324 | (5) | 1,659 |
| 1992 | 541 | 499 | 137 | 189 | 1,365 | 332 | (5) | 1,697 |
| 1993 | 556 | 513 | 142 | 192 | 1,402 | 334 | (5) | 1,736 |
| 1994 | 559 | 510 | 136 | R195 | R1,400 | R326 | (5) | R1,727 |
| 1995P | 572 | 518 | 153 | 185 | 1,427 | 334 | (5) | 1,761 |

[1] Reported production of ethane-propane mixtures has been allocated 70 percent ethane and 30 percent propane.

[2] Reported production of butane-propane mixtures has been allocated 60 percent butane and 40 percent propane.

[3] Prior to 1984, this category was reported separately as natural gasoline, isopentane, and plant condensate.

[4] Motor gasoline, aviation gasoline, special naphthas, distillate fuel oil, and miscellaneous products.

[5] Beginning in 1989, data on finished petroleum products production from natural gas processing plants were no longer available.

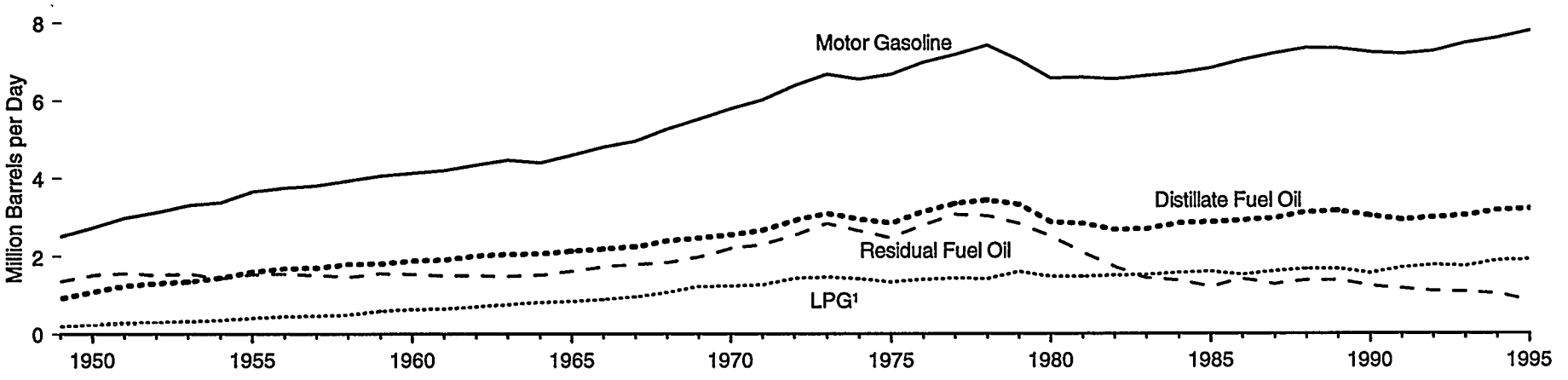
R=Revised data. P=Preliminary data.

Note: Totals may not equal sum of components due to independent rounding.

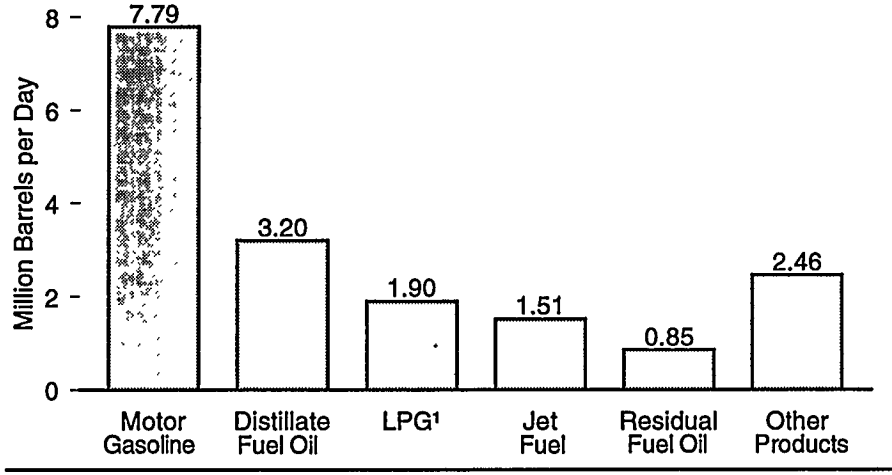
Sources: • 1949-1968—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1969-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.11 Petroleum Products Supplied by Type

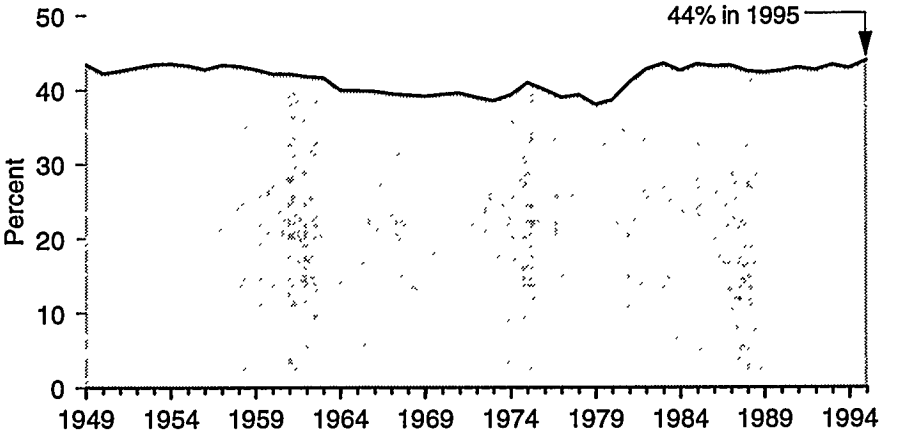
**By Selected Product, 1949-1995**




**By Product, 1995**




**Motor Gasoline's Share of Total Petroleum Products Supplied, 1949-1995**




¹ Liquefied petroleum gases.

Source: Table 5.11.

# Table 5.11 Petroleum Products Supplied by Type, 1949-1995

(Million Barrels per Day)

| Year | Motor Gasoline [1] | Jet Fuel | Distillate Fuel Oil | Residual Fuel Oil | Liquefied Petroleum Gases | | Other Products [3] | Total Products | Percentage Change from Previous Year [4] |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Propane [2] | Total | | | |
| 1949 | 2.50 | NA | 0.90 | 1.36 | NA | 0.19 | 0.81 | 5.76 | — |
| 1950 | 2.72 | NA | 1.08 | 1.52 | NA | 0.23 | 0.90 | 6.46 | 12.1 |
| 1951 | 2.99 | NA | 1.23 | 1.55 | NA | 0.28 | 0.98 | 7.02 | 8.6 |
| 1952 | 3.12 | 0.05 | 1.30 | 1.52 | NA | 0.30 | 0.98 | 7.27 | 3.9 |
| 1953 | 3.30 | 0.09 | 1.34 | 1.54 | NA | 0.33 | 1.00 | 7.60 | 4.3 |
| 1954 | 3.37 | 0.13 | 1.44 | 1.43 | NA | 0.35 | 1.03 | 7.76 | 2.1 |
| 1955 | 3.66 | 0.15 | 1.59 | 1.53 | NA | 0.40 | 1.12 | 8.46 | 9.0 |
| 1956 | 3.75 | 0.20 | 1.68 | 1.54 | NA | 0.44 | 1.16 | 8.78 | 4.1 |
| 1957 | 3.82 | 0.20 | 1.69 | 1.50 | NA | 0.45 | 1.15 | 8.81 | 0.1 |
| 1958 | 3.93 | 0.26 | 1.79 | 1.45 | NA | 0.49 | 1.19 | 9.12 | 3.5 |
| 1959 | 4.07 | 0.29 | 1.81 | 1.54 | NA | 0.58 | 1.24 | 9.53 | 4.5 |
| 1960 | 4.13 | 0.28 | 1.87 | 1.53 | NA | 0.62 | 1.36 | 9.80 | 3.1 |
| 1961 | 4.20 | 0.29 | 1.90 | 1.50 | NA | 0.64 | 1.44 | 9.98 | 1.5 |
| 1962 | 4.34 | 0.31 | 2.01 | 1.50 | NA | 0.70 | 1.55 | 10.40 | 4.2 |
| 1963 | 4.47 | 0.32 | 2.05 | 1.48 | NA | 0.76 | 1.68 | 10.74 | 3.3 |
| 1964 | 4.40 | 0.32 | 2.05 | 1.52 | NA | 0.81 | 1.92 | 11.02 | 2.9 |
| 1965 | 4.59 | 0.60 | 2.13 | 1.61 | NA | 0.84 | 1.74 | 11.51 | 4.2 |
| 1966 | 4.81 | 0.67 | 2.18 | 1.72 | NA | 0.89 | 1.82 | 12.08 | 5.0 |
| 1967 | 4.96 | 0.82 | 2.24 | 1.79 | 0.62 | 0.94 | 1.81 | 12.56 | 3.9 |
| 1968 | 5.26 | 0.95 | 2.39 | 1.83 | 0.69 | 1.05 | 1.91 | 13.39 | 6.9 |
| 1969 | 5.53 | 0.99 | 2.47 | 1.98 | 0.78 | 1.22 | 1.95 | 14.14 | 5.3 |
| 1970 | 5.78 | 0.97 | 2.54 | 2.20 | 0.78 | 1.22 | 1.98 | 14.70 | 4.0 |
| 1971 | 6.01 | 1.01 | 2.66 | 2.30 | 0.79 | 1.25 | 1.98 | 15.21 | 3.5 |
| 1972 | 6.38 | 1.05 | 2.91 | 2.53 | 0.89 | 1.42 | 2.08 | 16.37 | 7.9 |
| 1973 | 6.67 | 1.06 | 3.09 | 2.82 | 0.87 | 1.45 | 2.21 | 17.31 | 5.5 |
| 1974 | 6.54 | 0.99 | 2.95 | 2.64 | 0.83 | 1.41 | 2.13 | 16.65 | -3.8 |
| 1975 | 6.67 | 1.00 | 2.85 | 2.46 | 0.78 | 1.33 | 2.00 | 16.32 | -2.0 |
| 1976 | 6.98 | 0.99 | 3.13 | 2.80 | 0.83 | 1.40 | 2.16 | 17.46 | 7.3 |
| 1977 | 7.18 | 1.04 | 3.35 | 3.07 | 0.82 | 1.42 | 2.37 | 18.43 | 5.3 |
| 1978 | 7.41 | 1.06 | 3.43 | 3.02 | 0.78 | 1.41 | 2.51 | 18.85 | 2.3 |
| 1979 | 7.03 | 1.08 | 3.31 | 2.83 | 0.85 | 1.59 | 2.67 | 18.51 | -1.8 |
| 1980 | 6.58 | 1.07 | 2.87 | 2.51 | 0.75 | 1.47 | 2.57 | 17.06 | -7.6 |
| 1981 | 6.59 | 1.01 | 2.83 | 2.09 | 0.77 | 1.47 | 2.08 | 16.06 | -6.1 |
| 1982 | 6.54 | 1.01 | 2.67 | 1.72 | 0.80 | 1.50 | 1.86 | 15.30 | -4.7 |
| 1983 | 6.62 | 1.05 | 2.69 | 1.42 | 0.75 | 1.51 | 1.94 | 15.23 | -0.4 |
| 1984 | 6.69 | 1.18 | 2.84 | 1.37 | 0.83 | 1.57 | 2.07 | 15.73 | 3.5 |
| 1985 | 6.83 | 1.22 | 2.87 | 1.20 | 0.88 | 1.60 | 2.01 | 15.73 | -0.3 |
| 1986 | 7.03 | 1.31 | 2.91 | 1.42 | 0.83 | 1.51 | 2.09 | 16.28 | 3.5 |
| 1987 | 7.21 | 1.38 | 2.98 | 1.26 | 0.92 | 1.61 | 2.22 | 16.67 | 2.4 |
| 1988 | 7.34 | 1.45 | 3.12 | 1.38 | 0.92 | 1.66 | 2.34 | 17.28 | 4.0 |
| 1989 | 7.33 | 1.49 | 3.16 | 1.37 | 0.99 | 1.67 | 2.31 | 17.33 | -0.0 |
| 1990 | 7.23 | 1.52 | 3.02 | 1.23 | 0.92 | 1.56 | 2.43 | 16.99 | -1.9 |
| 1991 | 7.19 | 1.47 | 2.92 | 1.16 | 0.98 | 1.69 | 2.29 | 16.71 | -1.6 |
| 1992 | 7.27 | 1.45 | 2.98 | 1.09 | 1.03 | 1.76 | 2.48 | 17.03 | 2.2 |
| 1993 | 7.48 | 1.47 | 3.04 | 1.08 | 1.01 | 1.73 | 2.44 | 17.24 | 0.9 |
| 1994 | R7.60 | 1.53 | R3.16 | R1.02 | 1.08 | 1.88 | R2.53 | R17.72 | R2.8 |
| 1995P | 7.79 | 1.51 | 3.20 | 0.85 | 1.09 | 1.90 | 2.46 | 17.70 | -0.1 |

[1] Prior to 1964, motor gasoline data were for total gasoline, including motor gasoline, aviation gasoline, and special naphthas.

[2] Includes propylene.

[3] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, still gas, pentanes plus, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included. Prior to 1965, kerosene-type jet fuel was included in kerosene. For 1981 forward, other products include negative barrels per day of distillate and residual fuel oil reclassified as unfinished oils and other products (from both primary and secondary supply) reclassified as gasoline blending components. Beginning in 1983, product supplied has also included crude oil burned as fuel.

[4] Percent change from previous year calculated from data prior to rounding.

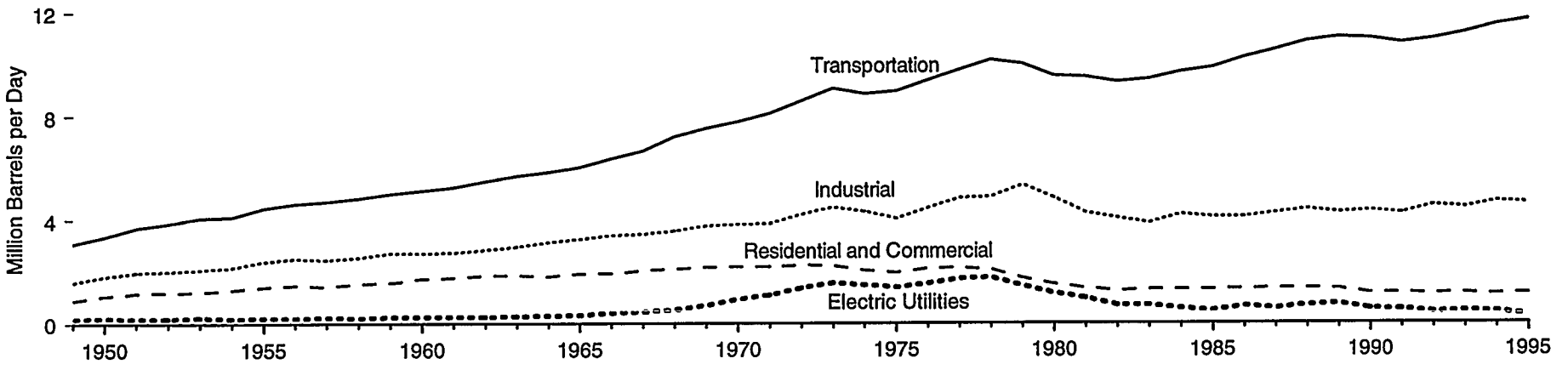
R=Revised data. P=Preliminary. NA=Not available. — = Not applicable.

Notes: • For the definition of petroleum products supplied, see Notes 1, 3, and 4 at end of section. • Totals may not equal sum of components due to independent rounding.

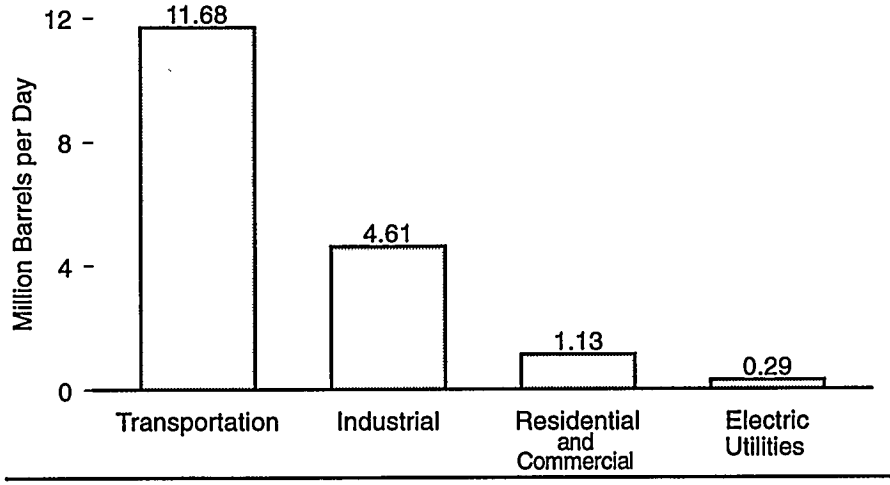
Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.12a Petroleum Products Supplied by Sector

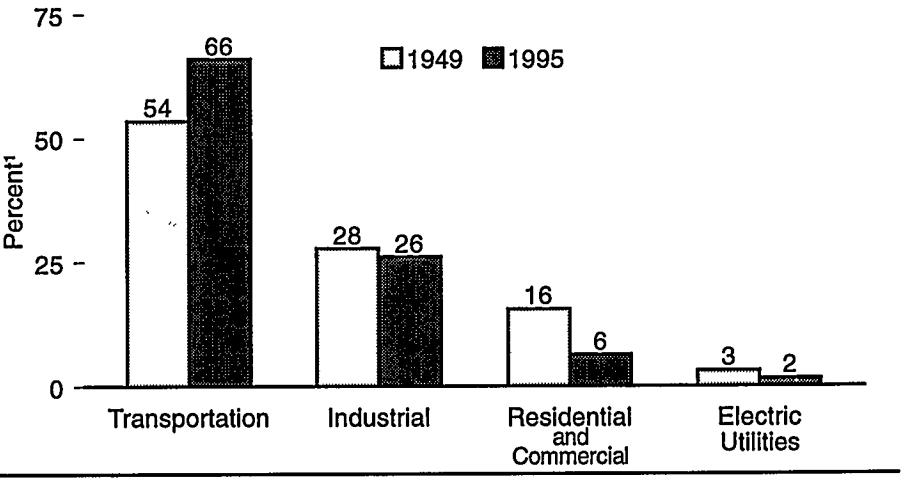
**By Sector, 1949-1995**




**By Sector, 1995**



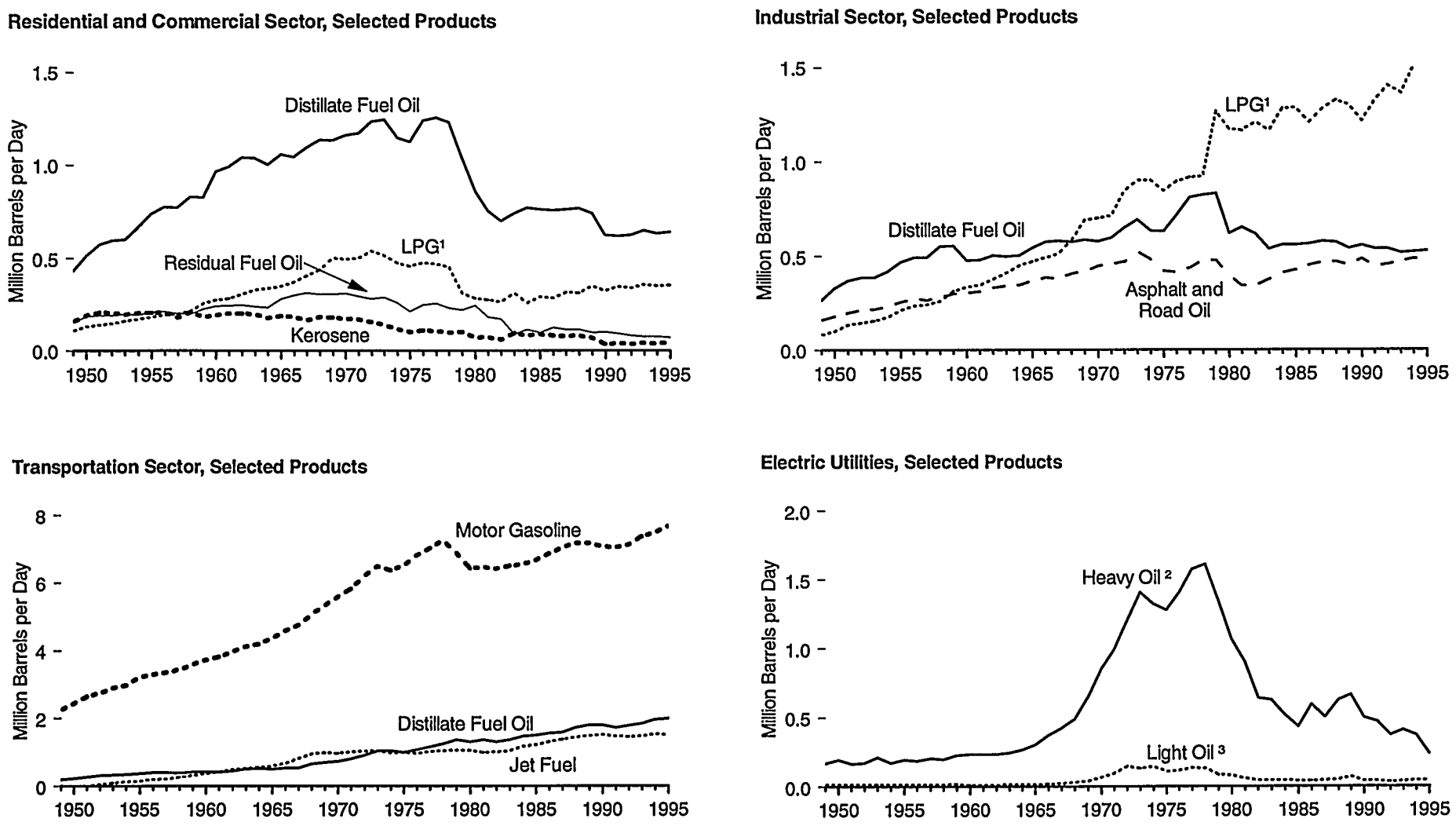

**Shares by Sector, 1949 and 1995**




[1] Totals may not equal sum of components due to independent rounding.
Note: See related Figure 5.12b.

Sources: Tables 5.12a and 5.12b.

# Figure 5.12b Petroleum Products Supplied by Product by Sector, 1949-1995




¹ Liquefied petroleum gases.

² Prior to 1980, based on oil used in steam plants. Since 1980, heavy oil includes fuel oil nos. 4, 5, and 6, and residual fuel oil.

³ Prior to 1980, based on oil used in internal combustion and gas turbine engine plants. Since 1980, light oil includes fuel nos. 1 and 2, kerosene, and jet fuel.

Notes: • See related Figure 5.12a. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.12a and 5.12b.

# Table 5.12a Petroleum Products Supplied to the Residential and Commercial Sector and the Industrial Sector, 1949-1995

(Million Barrels per Day)

| Year | Residential and Commercial | | | | | | Industrial | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Distillate Fuel Oil | Kerosene | Liquefied Petroleum Gases | Motor Gasoline | Residual Fuel Oil | Total | Asphalt and Road Oil | Distillate Fuel Oil | Kerosene | Liquefied Petroleum Gases | Lubricants | Motor Gasoline | Residual Fuel Oil | Other [1] | Total |
| 1949 | 0.43 | 0.16 | 0.11 | 0.05 | 0.15 | 0.90 | 0.16 | 0.27 | 0.12 | 0.08 | 0.04 | 0.12 | 0.53 | 0.28 | 1.60 |
| 1950 | 0.51 | 0.19 | 0.13 | 0.05 | 0.18 | 1.07 | 0.18 | 0.33 | 0.13 | 0.10 | 0.04 | 0.13 | 0.62 | 0.29 | 1.82 |
| 1951 | 0.57 | 0.21 | 0.14 | 0.06 | 0.19 | 1.17 | 0.20 | 0.37 | 0.13 | 0.13 | 0.05 | 0.14 | 0.63 | 0.33 | 1.98 |
| 1952 | 0.59 | 0.21 | 0.15 | 0.06 | 0.19 | 1.20 | 0.21 | 0.39 | 0.13 | 0.14 | 0.04 | 0.15 | 0.63 | 0.33 | 2.02 |
| 1953 | 0.60 | 0.20 | 0.16 | 0.06 | 0.20 | 1.22 | 0.22 | 0.38 | 0.12 | 0.16 | 0.04 | 0.16 | 0.65 | 0.36 | 2.08 |
| 1954 | 0.67 | 0.20 | 0.17 | 0.06 | 0.19 | 1.30 | 0.23 | 0.42 | 0.12 | 0.17 | 0.04 | 0.16 | 0.64 | 0.37 | 2.16 |
| 1955 | 0.74 | 0.20 | 0.18 | 0.07 | 0.21 | 1.40 | 0.25 | 0.47 | 0.12 | 0.21 | 0.05 | 0.17 | 0.69 | 0.43 | 2.39 |
| 1956 | 0.78 | 0.21 | 0.20 | 0.07 | 0.21 | 1.46 | 0.27 | 0.49 | 0.11 | 0.23 | 0.05 | 0.18 | 0.70 | 0.45 | 2.49 |
| 1957 | 0.77 | 0.18 | 0.20 | 0.07 | 0.20 | 1.43 | 0.26 | 0.49 | 0.10 | 0.24 | 0.05 | 0.18 | 0.66 | 0.48 | 2.46 |
| 1958 | 0.83 | 0.21 | 0.21 | 0.07 | 0.20 | 1.53 | 0.28 | 0.55 | 0.08 | 0.26 | 0.04 | 0.19 | 0.64 | 0.50 | 2.54 |
| 1959 | 0.83 | 0.18 | 0.26 | 0.08 | 0.23 | 1.57 | 0.30 | 0.55 | 0.08 | 0.31 | 0.05 | 0.19 | 0.70 | 0.52 | 2.71 |
| 1960 | 0.97 | 0.19 | 0.27 | 0.03 | 0.24 | 1.71 | 0.30 | 0.48 | 0.08 | 0.33 | 0.05 | 0.20 | 0.69 | 0.58 | 2.71 |
| 1961 | 0.99 | 0.20 | 0.28 | 0.04 | 0.25 | 1.76 | 0.31 | 0.48 | 0.06 | 0.34 | 0.05 | 0.19 | 0.66 | 0.76 | 2.72 |
| 1962 | 1.04 | 0.20 | 0.31 | 0.04 | 0.25 | 1.84 | 0.33 | 0.50 | 0.07 | 0.38 | 0.05 | 0.19 | 0.67 | 0.65 | 2.84 |
| 1963 | 1.04 | 0.20 | 0.33 | 0.04 | 0.24 | 1.84 | 0.34 | 0.50 | 0.07 | 0.41 | 0.05 | 0.18 | 0.67 | 0.74 | 2.96 |
| 1964 | 1.00 | 0.18 | 0.34 | 0.04 | 0.24 | 1.79 | 0.35 | 0.50 | 0.08 | 0.45 | 0.06 | 0.18 | 0.68 | 0.84 | 3.12 |
| 1965 | 1.06 | 0.19 | 0.35 | 0.04 | 0.28 | 1.91 | 0.37 | 0.54 | 0.08 | 0.47 | 0.06 | 0.18 | 0.69 | 0.86 | 3.25 |
| 1966 | 1.04 | 0.18 | 0.37 | 0.04 | 0.30 | 1.94 | 0.39 | 0.58 | 0.09 | 0.49 | 0.06 | 0.17 | 0.71 | 0.92 | 3.40 |
| 1967 | 1.10 | 0.16 | 0.41 | 0.04 | 0.31 | 2.02 | 0.38 | 0.58 | 0.11 | 0.51 | 0.06 | 0.16 | 0.69 | 0.94 | 3.43 |
| 1968 | 1.14 | 0.18 | 0.44 | 0.04 | 0.31 | 2.10 | 0.41 | 0.57 | 0.10 | 0.59 | 0.07 | 0.16 | 0.68 | 1.01 | 3.58 |
| 1969 | 1.13 | 0.18 | 0.50 | 0.04 | 0.30 | 2.16 | 0.42 | 0.59 | 0.10 | 0.69 | 0.07 | 0.15 | 0.69 | 1.06 | 3.76 |
| 1970 | 1.16 | 0.17 | 0.49 | 0.05 | 0.31 | 2.18 | 0.45 | 0.58 | 0.09 | 0.70 | 0.07 | 0.15 | 0.71 | 1.07 | 3.81 |
| 1971 | 1.17 | 0.17 | 0.50 | 0.04 | 0.29 | 2.18 | 0.46 | 0.60 | 0.08 | 0.71 | 0.07 | 0.14 | 0.71 | 1.08 | 3.84 |
| 1972 | 1.23 | 0.16 | 0.54 | 0.05 | 0.28 | 2.25 | 0.47 | 0.65 | 0.08 | 0.85 | 0.07 | 0.13 | 0.77 | 1.18 | 4.19 |
| 1973 | 1.24 | 0.14 | 0.51 | 0.05 | 0.29 | 2.23 | 0.52 | 0.69 | 0.08 | 0.90 | 0.09 | 0.13 | 0.81 | 1.26 | 4.48 |
| 1974 | 1.15 | 0.12 | 0.47 | 0.04 | 0.26 | 2.04 | 0.48 | 0.63 | 0.06 | 0.90 | 0.08 | 0.12 | 0.75 | 1.26 | 4.30 |
| 1975 | 1.13 | 0.10 | 0.46 | 0.05 | 0.21 | 1.95 | 0.42 | 0.63 | 0.06 | 0.84 | 0.07 | 0.12 | 0.66 | 1.25 | 4.04 |
| 1976 | 1.24 | 0.11 | 0.48 | 0.05 | 0.25 | 2.12 | 0.41 | 0.72 | 0.06 | 0.90 | 0.07 | 0.11 | 0.79 | 1.39 | 4.45 |
| 1977 | 1.26 | 0.11 | 0.47 | 0.05 | 0.26 | 2.14 | 0.44 | 0.81 | 0.07 | 0.92 | 0.08 | 0.10 | 0.84 | 1.56 | 4.82 |
| 1978 | 1.23 | 0.10 | 0.45 | 0.06 | 0.23 | 2.07 | 0.48 | 0.82 | 0.08 | 0.92 | 0.09 | 0.09 | 0.75 | 1.64 | 4.87 |
| 1979 | 1.04 | 0.10 | 0.31 | 0.05 | 0.22 | 1.73 | 0.48 | 0.83 | 0.09 | 1.27 | 0.09 | 0.08 | 0.72 | 1.79 | 5.34 |
| 1980 | 0.86 | 0.07 | 0.28 | 0.06 | 0.25 | 1.52 | 0.40 | 0.62 | 0.09 | 1.17 | 0.08 | 0.08 | 0.59 | 1.81 | 4.84 |
| 1981 | 0.75 | 0.07 | 0.28 | 0.05 | 0.18 | 1.33 | 0.34 | 0.65 | 0.05 | 1.17 | 0.08 | 0.08 | 0.47 | 1.43 | 4.27 |
| 1982 | 0.70 | 0.06 | 0.26 | 0.05 | 0.17 | 1.24 | 0.34 | 0.62 | 0.07 | 1.21 | 0.07 | 0.07 | 0.46 | 1.22 | 4.06 |
| 1983 | 0.74 | 0.10 | 0.31 | 0.05 | 0.09 | 1.29 | 0.37 | 0.54 | 0.03 | 1.17 | 0.08 | 0.06 | 0.34 | 1.27 | 3.85 |
| 1984 | 0.77 | 0.09 | 0.26 | 0.06 | 0.12 | 1.29 | 0.41 | 0.56 | 0.03 | 1.28 | 0.08 | 0.08 | 0.39 | 1.36 | 4.19 |
| 1985 | 0.76 | 0.09 | 0.29 | 0.05 | 0.10 | 1.30 | 0.43 | 0.56 | 0.02 | 1.29 | 0.07 | 0.11 | 0.33 | 1.29 | 4.10 |
| 1986 | 0.76 | 0.08 | 0.29 | 0.06 | 0.13 | 1.31 | 0.45 | 0.56 | 0.02 | 1.21 | 0.07 | 0.11 | 0.32 | 1.37 | 4.11 |
| 1987 | 0.76 | 0.08 | 0.32 | 0.06 | 0.11 | 1.33 | 0.47 | 0.58 | 0.01 | 1.28 | 0.08 | 0.11 | 0.25 | 1.47 | 4.25 |
| 1988 | 0.77 | 0.08 | 0.31 | 0.06 | 0.11 | 1.34 | 0.47 | 0.57 | 0.01 | 1.33 | 0.08 | 0.10 | 0.24 | 1.59 | 4.39 |
| 1989 | 0.74 | 0.07 | 0.35 | 0.05 | 0.10 | 1.32 | 0.45 | 0.54 | 0.01 | 1.30 | 0.08 | 0.10 | 0.18 | 1.58 | 4.26 |
| 1990 | 0.62 | 0.04 | 0.32 | 0.06 | 0.10 | 1.14 | 0.48 | 0.56 | 0.01 | 1.22 | 0.08 | 0.10 | 0.18 | 1.70 | 4.32 |
| 1991 | 0.62 | 0.04 | 0.35 | 0.04 | 0.09 | 1.14 | 0.44 | 0.54 | 0.01 | 1.33 | 0.08 | 0.10 | 0.15 | 1.62 | 4.25 |
| 1992 | 0.62 | 0.04 | 0.34 | 0.04 | 0.08 | 1.12 | 0.45 | 0.54 | (s) | 1.40 | 0.08 | 0.10 | 0.17 | 1.80 | 4.55 |
| 1993 | 0.65 | 0.04 | 0.36 | 0.02 | 0.08 | 1.14 | 0.47 | 0.52 | 0.01 | 1.36 | 0.08 | 0.09 | 0.20 | 1.72 | 4.45 |
| 1994 | 0.63 | 0.04 | 0.35 | 0.01 | 0.08 | 1.11 | 0.48 | 0.52 | 0.01 | 1.50 | 0.08 | 0.10 | 0.19 | 1.80 | 4.69 |
| 1995[E] | 0.64 | 0.05 | 0.35 | 0.01 | 0.07 | 1.13 | 0.49 | 0.53 | 0.01 | 1.52 | 0.08 | 0.10 | 0.16 | 1.73 | 4.61 |

[1] "Other" is petrochemical feedstocks, special naphthas, waxes, petroleum coke, still gas, natural gasoline, pentanes plus, crude oil, and miscellaneous products.

E=Estimate. (s)=Less than 5,000 barrels per day.

Notes: • See Table 5.12b for the transportation sector, electric utilities, and overall total. • See Notes 1 and 3 at end of section for comments on the calculation of products supplied. • Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual,* and Energy Information Administration (EIA) estimates. • 1960-1994—EIA, State Energy Data System 1994. • 1995—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 1996).

# Table 5.12b Petroleum Products Supplied to the Transportation Sector, Electric Utilities, and Total, 1949-1995

(Million Barrels per Day)

| Year | Transportation | | | | | | | | Electric Utilities | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aviation Gasoline | Distillate Fuel Oil | Jet Fuel | Liquefied Petroleum Gases | Lubricants | Motor Gasoline | Residual Fuel Oil | Total | Heavy Oil [1] | Light Oil [2] | Petroleum Coke | Total | |
| 1949 | 0.09 | 0.19 | 0.00 | (s) | 0.05 | 2.24 | 0.50 | 3.08 | 0.17 | 0.01 | 0.00 | 0.18 | 5.76 |
| 1950 | 0.11 | 0.23 | 0.00 | (s) | 0.06 | 2.43 | 0.52 | 3.36 | 0.19 | 0.01 | 0.00 | 0.21 | 6.46 |
| 1951 | 0.15 | 0.27 | 0.00 | (s) | 0.07 | 2.64 | 0.56 | 3.69 | 0.16 | 0.01 | 0.00 | 0.18 | 7.02 |
| 1952 | 0.17 | 0.31 | 0.05 | 0.01 | 0.06 | 2.75 | 0.52 | 3.87 | 0.17 | 0.01 | 0.00 | 0.18 | 7.27 |
| 1953 | 0.19 | 0.34 | 0.09 | 0.01 | 0.07 | 2.89 | 0.48 | 4.07 | 0.21 | 0.02 | 0.00 | 0.23 | 7.60 |
| 1954 | 0.18 | 0.34 | 0.13 | 0.01 | 0.06 | 2.97 | 0.43 | 4.11 | 0.17 | 0.01 | 0.00 | 0.18 | 7.76 |
| 1955 | 0.19 | 0.37 | 0.15 | 0.01 | 0.07 | 3.22 | 0.44 | 4.46 | 0.19 | 0.01 | 0.00 | 0.21 | 8.46 |
| 1956 | 0.20 | 0.40 | 0.20 | 0.01 | 0.07 | 3.30 | 0.44 | 4.62 | 0.18 | 0.01 | 0.00 | 0.20 | 8.78 |
| 1957 | 0.20 | 0.41 | 0.22 | 0.01 | 0.07 | 3.36 | 0.44 | 4.71 | 0.20 | 0.02 | 0.00 | 0.22 | 8.81 |
| 1958 | 0.22 | 0.39 | 0.27 | 0.01 | 0.06 | 3.45 | 0.41 | 4.83 | 0.20 | 0.02 | 0.00 | 0.21 | 9.12 |
| 1959 | 0.21 | 0.41 | 0.33 | 0.01 | 0.07 | 3.59 | 0.39 | 5.01 | 0.22 | 0.02 | 0.00 | 0.24 | 9.53 |
| 1960 | 0.16 | 0.42 | 0.37 | 0.01 | 0.07 | 3.74 | 0.37 | 5.14 | 0.23 | 0.01 | 0.00 | 0.24 | 9.80 |
| 1961 | 0.16 | 0.42 | 0.42 | 0.01 | 0.07 | 3.82 | 0.36 | 5.25 | 0.23 | 0.01 | 0.00 | 0.24 | 9.98 |
| 1962 | 0.14 | 0.45 | 0.49 | 0.02 | 0.07 | 3.97 | 0.34 | 5.48 | 0.23 | 0.01 | 0.00 | 0.24 | 10.40 |
| 1963 | 0.14 | 0.50 | 0.52 | 0.02 | 0.07 | 4.11 | 0.33 | 5.68 | 0.24 | 0.01 | 0.00 | 0.26 | 10.74 |
| 1964 | 0.13 | 0.53 | 0.56 | 0.02 | 0.07 | 4.19 | 0.34 | 5.83 | 0.26 | 0.01 | 0.00 | 0.28 | 11.02 |
| 1965 | 0.12 | 0.51 | 0.60 | 0.02 | 0.07 | 4.37 | 0.34 | 6.04 | 0.30 | 0.01 | 0.00 | 0.32 | 11.51 |
| 1966 | 0.11 | 0.55 | 0.67 | 0.03 | 0.07 | 4.60 | 0.34 | 6.36 | 0.37 | 0.02 | 0.00 | 0.39 | 12.08 |
| 1967 | 0.09 | 0.54 | 0.82 | 0.03 | 0.06 | 4.76 | 0.36 | 6.66 | 0.42 | 0.02 | 0.00 | 0.44 | 12.56 |
| 1968 | 0.08 | 0.65 | 0.95 | 0.03 | 0.07 | 5.06 | 0.35 | 7.20 | 0.49 | 0.03 | 0.00 | 0.52 | 13.39 |
| 1969 | 0.07 | 0.70 | 0.99 | 0.03 | 0.07 | 5.33 | 0.33 | 7.52 | 0.65 | 0.04 | 0.00 | 0.69 | 14.14 |
| 1970 | 0.05 | 0.74 | 0.97 | 0.03 | 0.07 | 5.59 | 0.33 | 7.78 | 0.85 | 0.07 | 0.01 | 0.93 | 14.70 |
| 1971 | 0.05 | 0.80 | 1.01 | 0.04 | 0.07 | 5.83 | 0.31 | 8.09 | 0.99 | 0.09 | 0.01 | 1.09 | 15.21 |
| 1972 | 0.05 | 0.91 | 1.02 | 0.04 | 0.07 | 6.20 | 0.28 | 8.57 | 1.20 | 0.15 | 0.01 | 1.36 | 16.37 |
| 1973 | 0.05 | 1.05 | 1.04 | 0.04 | 0.07 | 6.50 | 0.32 | 9.05 | 1.41 | 0.13 | 0.01 | 1.54 | 17.31 |
| 1974 | 0.04 | 1.04 | 0.98 | 0.03 | 0.07 | 6.37 | 0.30 | 8.84 | 1.32 | 0.15 | 0.01 | 1.48 | 16.65 |
| 1975 | 0.04 | 1.00 | 0.99 | 0.03 | 0.07 | 6.51 | 0.31 | 8.95 | 1.28 | 0.11 | (s) | 1.39 | 16.32 |
| 1976 | 0.04 | 1.07 | 0.98 | 0.03 | 0.08 | 6.82 | 0.36 | 9.37 | 1.40 | 0.11 | (s) | 1.52 | 17.46 |
| 1977 | 0.04 | 1.17 | 1.02 | 0.04 | 0.08 | 7.02 | 0.40 | 9.76 | 1.57 | 0.13 | (s) | 1.71 | 18.43 |
| 1978 | 0.04 | 1.26 | 1.04 | 0.04 | 0.08 | 7.26 | 0.43 | 10.16 | 1.61 | 0.13 | 0.01 | 1.75 | 18.85 |
| 1979 | 0.04 | 1.37 | 1.07 | 0.02 | 0.09 | 6.90 | 0.54 | 10.01 | 1.35 | 0.08 | (s) | 1.44 | 18.51 |
| 1980 | 0.03 | 1.31 | 1.06 | 0.01 | 0.08 | 6.44 | 0.61 | 9.55 | 1.07 | 0.08 | (s) | 1.15 | 17.06 |
| 1981 | 0.03 | 1.36 | 1.01 | 0.02 | 0.07 | 6.46 | 0.53 | 9.49 | 0.90 | 0.06 | (s) | 0.96 | 16.06 |
| 1982 | 0.03 | 1.31 | 1.01 | 0.02 | 0.07 | 6.42 | 0.44 | 9.31 | 0.64 | 0.04 | (s) | 0.69 | 15.30 |
| 1983 | 0.03 | 1.37 | 1.05 | 0.03 | 0.07 | 6.51 | 0.36 | 9.41 | 0.63 | 0.05 | (s) | 0.68 | 15.23 |
| 1984 | 0.02 | 1.47 | 1.18 | 0.03 | 0.08 | 6.55 | 0.35 | 9.68 | 0.52 | 0.04 | (s) | 0.56 | 15.73 |
| 1985 | 0.03 | 1.51 | 1.22 | 0.02 | 0.07 | 6.67 | 0.34 | 9.85 | 0.44 | 0.04 | (s) | 0.48 | 15.73 |
| 1986 | 0.03 | 1.55 | 1.31 | 0.02 | 0.07 | 6.87 | 0.38 | 10.23 | 0.59 | 0.04 | (s) | 0.64 | 16.28 |
| 1987 | 0.02 | 1.59 | 1.38 | 0.02 | 0.08 | 7.04 | 0.39 | 10.53 | 0.50 | 0.04 | (s) | 0.55 | 16.67 |
| 1988 | 0.03 | 1.73 | 1.45 | 0.02 | 0.08 | 7.18 | 0.40 | 10.87 | 0.63 | 0.05 | 0.01 | 0.68 | 17.28 |
| 1989 | 0.03 | 1.81 | 1.49 | 0.02 | 0.08 | 7.17 | 0.43 | 11.01 | 0.66 | 0.07 | 0.01 | 0.74 | 17.33 |
| 1990 | 0.02 | 1.80 | 1.52 | 0.02 | 0.08 | 7.08 | 0.45 | 10.97 | 0.50 | 0.04 | 0.01 | 0.55 | 16.99 |
| 1991 | 0.02 | 1.73 | 1.47 | 0.02 | 0.07 | 7.04 | 0.45 | 10.80 | 0.47 | 0.04 | 0.01 | 0.52 | 16.71 |
| 1992 | 0.02 | 1.79 | 1.45 | 0.01 | 0.07 | 7.13 | 0.47 | 10.95 | 0.37 | 0.03 | 0.01 | 0.42 | 17.03 |
| 1993 | 0.02 | 1.84 | 1.47 | 0.01 | 0.07 | 7.37 | 0.40 | 11.18 | 0.41 | 0.04 | 0.02 | 0.46 | 17.24 |
| 1994 | 0.02 | 1.96 | 1.53 | 0.02 | 0.08 | 7.49 | 0.39 | 11.49 | 0.37 | 0.04 | 0.01 | 0.43 | 17.72 |
| 1995[E] | 0.02 | 1.99 | 1.51 | 0.02 | 0.08 | 7.67 | 0.38 | 11.68 | 0.24 | 0.04 | 0.01 | 0.29 | 17.70 |

[1] Prior to 1980, based on oil used in steam plants. Since 1980, heavy oil has included fuel oil nos. 4, 5, and 6, and residual fuel oils.

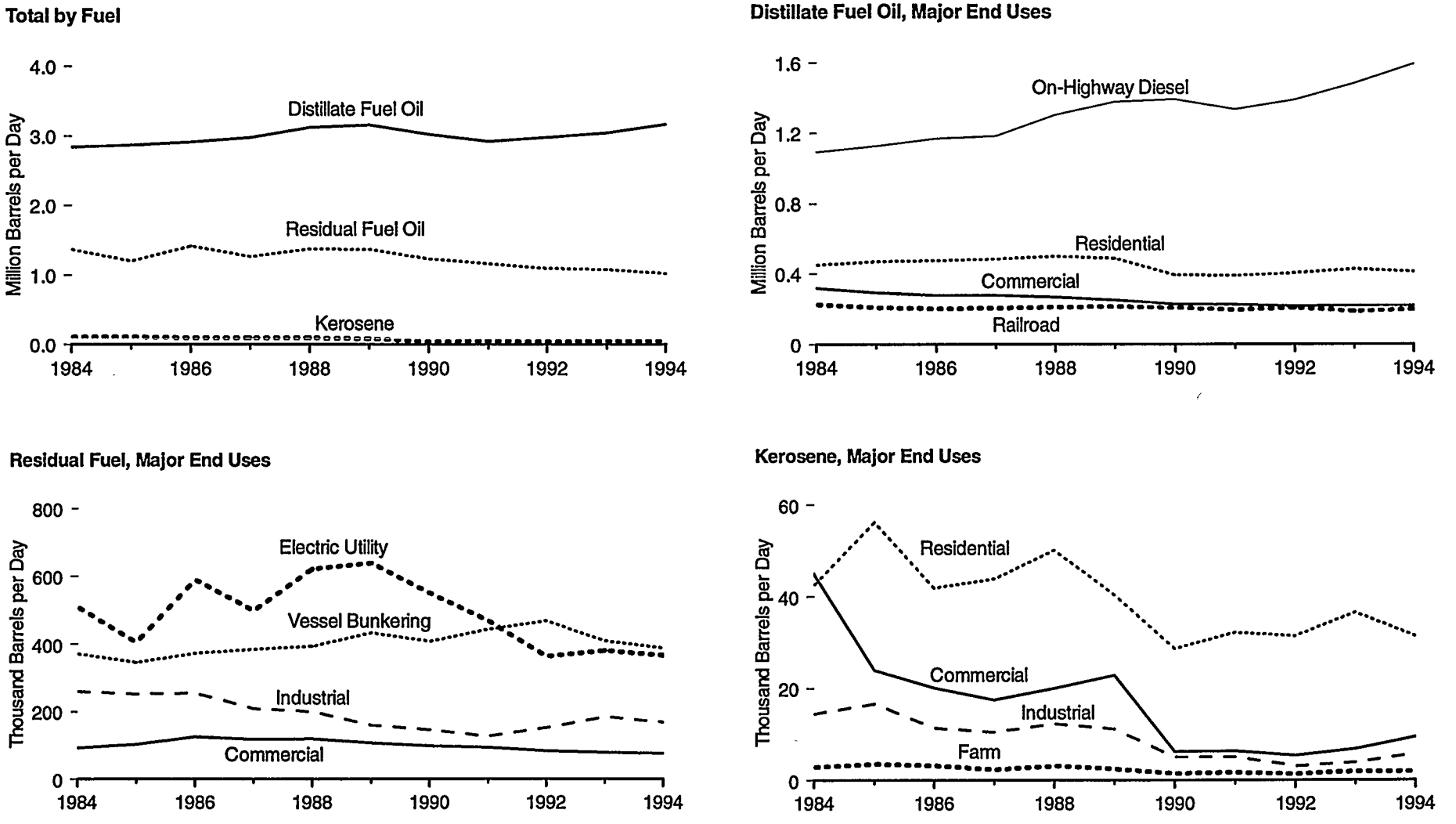
[2] Prior to 1980, based on oil used in internal combustion and gas turbine engine plants. Since 1980, light oil has included fuel oil nos. 1 and 2, kerosene, and jet fuel.

E=Estimate. (s)=Less than 5,000 barrels per day.

Notes: • See Table 5.12a for the residential and commercial sector and the industrial sector. • See Notes 1 and 3 at end of section for comments on the calculation of products supplied. • Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1959—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual*, and Energy Information Administration (EIA) estimates. • 1960-1994—EIA, State Energy Data System 1994. • 1995—EIA, Integrated Modeling Data System output for the *Monthly Energy Review* (March 1996).

# Figure 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1994




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.13.

# Table 5.13 Fuel Oil and Kerosene Adjusted Sales, 1984-1994

(Thousand Barrels per Day)

| Year | Residential | Commercial | Industrial | Oil Company | Farm | Electric Utility | Railroad | Vessel Bunkering | On-Highway Diesel | Military | Off-Highway Diesel | All Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Distillate Fuel Oil | | | | | | | |
| 1984 | 450 | 319 | 153 | 59 | 193 | 45 | 225 | 110 | 1,093 | 45 | 109 | 44 | 2,845 |
| 1985 | 471 | 294 | 169 | 57 | 216 | 34 | 209 | 124 | 1,127 | 50 | 105 | 12 | 2,868 |
| 1986 | 476 | 280 | 175 | 49 | 220 | 40 | 202 | 133 | 1,169 | 50 | 111 | 9 | 2,914 |
| 1987 | 484 | 279 | 190 | 58 | 211 | 42 | 205 | 145 | 1,185 | 58 | 113 | 5 | 2,976 |
| 1988 | 498 | 269 | 170 | 57 | 223 | 52 | 212 | 150 | 1,304 | 64 | 119 | 4 | 3,122 |
| 1989 | 489 | 252 | 167 | 55 | 209 | 70 | 213 | 154 | 1,378 | 61 | 107 | 2 | 3,157 |
| 1990 | 393 | 228 | 160 | 63 | 215 | 48 | 209 | 143 | 1,393 | 51 | 116 | (s) | 3,021 |
| 1991 | 391 | 226 | 152 | 59 | 214 | 39 | 197 | 141 | 1,336 | 54 | 110 | (s) | 2,921 |
| 1992 | 407 | 218 | 145 | 51 | 229 | 31 | 210 | 146 | 1,394 | 42 | 113 | (s) | 2,987 |
| 1993 | 429 | 218 | 128 | 50 | 211 | 38 | 190 | 133 | 1,485 | 31 | 127 | (s) | 3,041 |
| 1994 | 413 | 218 | 136 | 46 | 209 | 49 | 200 | 132 | 1,594 | 34 | 130 | (s) | 3,162 |
| | | | | | | Residual Fuel Oil | | | | | | | |
| 1984 | — | 92 | 258 | 76 | — | 509 | ([1]) | 370 | — | 14 | — | 50 | 1,369 |
| 1985 | — | 103 | 252 | 71 | — | 403 | ([1]) | 346 | — | 13 | — | 15 | 1,202 |
| 1986 | — | 126 | 254 | 51 | — | 590 | ([1]) | 371 | — | 12 | — | 15 | 1,418 |
| 1987 | — | 118 | 208 | 42 | — | 498 | ([1]) | 383 | — | E12 | — | 3 | 1,264 |
| 1988 | — | 119 | 200 | 34 | — | 621 | ([1]) | 392 | — | 9 | — | 4 | 1,378 |
| 1989 | — | 108 | 160 | 22 | — | 639 | ([1]) | 432 | — | 7 | — | 2 | 1,370 |
| 1990 | — | 98 | 145 | 21 | — | 550 | ([1]) | 408 | — | 5 | — | 2 | 1,229 |
| 1991 | — | 93 | 126 | 20 | — | 468 | NA | 443 | — | 8 | — | 1 | 1,158 |
| 1992 | — | 84 | 152 | 19 | — | 364 | NA | 470 | — | 7 | — | 1 | 1,097 |
| 1993 | — | 79 | 184 | 21 | — | 381 | NA | 409 | — | 6 | — | (s) | 1,080 |
| 1994 | — | 76 | 168 | 17 | — | 366 | NA | 388 | — | 4 | — | (s) | 1,021 |
| | | | | | | Kerosene | | | | | | | |
| 1984 | 42 | 45 | 14 | — | 3 | — | — | — | — | — | — | 11 | 115 |
| 1985 | 56 | 24 | 17 | — | 3 | — | — | — | — | — | — | 14 | 114 |
| 1986 | 42 | 20 | 11 | — | 3 | — | — | — | — | — | — | 22 | 98 |
| 1987 | 44 | 17 | 10 | — | 2 | — | — | — | — | — | — | 21 | 95 |
| 1988 | 50 | 20 | 12 | — | 3 | — | — | — | — | — | — | 11 | 96 |
| 1989 | 40 | 23 | 11 | — | 2 | — | — | — | — | — | — | 8 | 84 |
| 1990 | 29 | 6 | 5 | — | 1 | — | — | — | — | — | — | 1 | 43 |
| 1991 | 32 | 6 | 5 | — | 2 | — | — | — | — | — | — | 1 | 46 |
| 1992 | 31 | 5 | 3 | — | 1 | — | — | — | — | — | — | (s) | 42 |
| 1993 | 37 | 7 | 4 | — | 2 | — | — | — | — | — | — | 1 | 50 |
| 1994 | 31 | 9 | 6 | — | 2 | — | — | — | — | — | — | 1 | 49 |

[1] Included in "All Other."

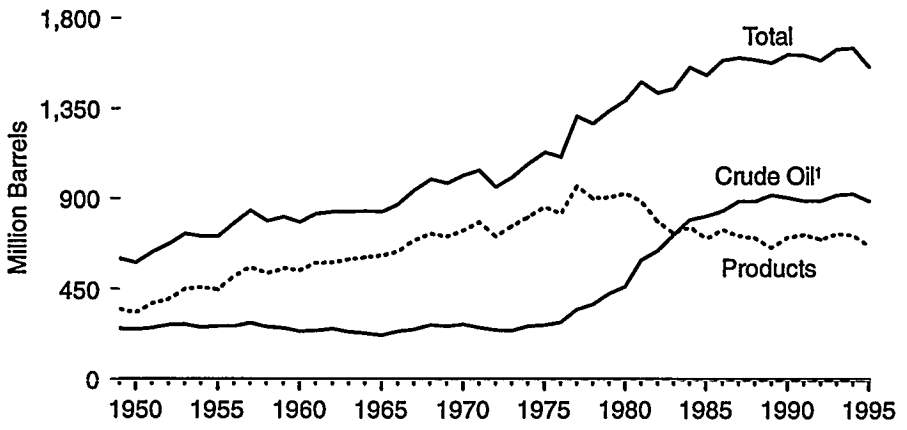
E = Annual estimate based on eleven months of data. NA=Not available. — = Not applicable. (s)=Less than 0.5 thousand barrels per day.

Notes: • Distillate fuel oil and kerosene data are sales data that were adjusted at the Petroleum Administration for Defense district level to equal Energy Information Administration (EIA) volume estimates of products supplied in the U.S. marketplace. The residual fuel data are sales data adjusted at the national level to equal the EIA volume estimate of residual fuel oil products supplied. Additional information is available in EIA's report *Fuel Oil and Kerosene Sales 1994* (October 1995). • Totals may not equal sum of components due to independent rounding.

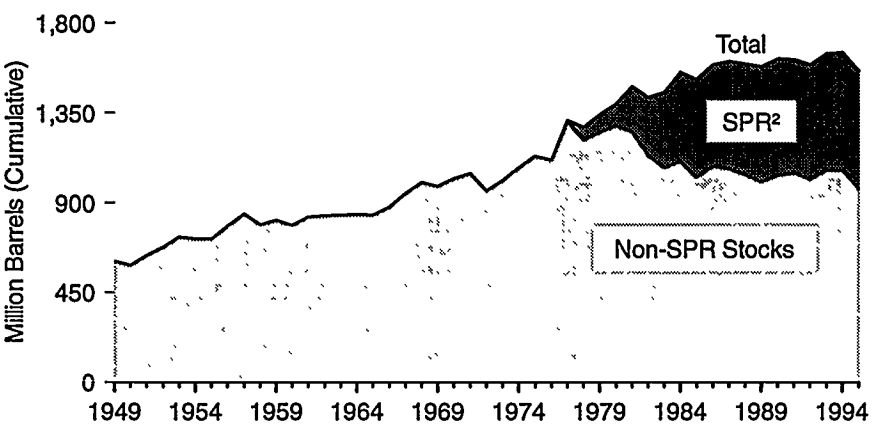
Sources: **Distillate Fuel Oil and Kerosene:** • 1984—EIA, *Petroleum Marketing Annual 1988*, Tables A13 and A15. • 1985—EIA, *Fuel Oil and Kerosene Sales 1989* (January 1991), Tables 13 and 15. • 1986-1988—EIA, *Fuel Oil and Kerosene Sales 1990* (October 1991), Tables 13 and 15. • 1989 forward—EIA, *Fuel Oil and Kerosene Sales 1994* (September 1995), Tables 13 and 15. **Residual Fuel Oil:** • 1984—EIA, *Petroleum Marketing Annual 1988*, Table A14. • 1985-1986—EIA, *Fuel Oil and Kerosene Sales 1990* (October 1991), Table A1. • 1987—EIA, *Fuel Oil and Kerosene Sales 1991* (November 1992), Table 14. • 1988—EIA, *Fuel Oil and Kerosene Sales 1993* (October 1994), Table 14. • 1989 forward—EIA, *Fuel Oil and Kerosene Sales 1994* (September 1995), Table 14.

# Figure 5.14 Petroleum Primary Stocks by Type, End of Year

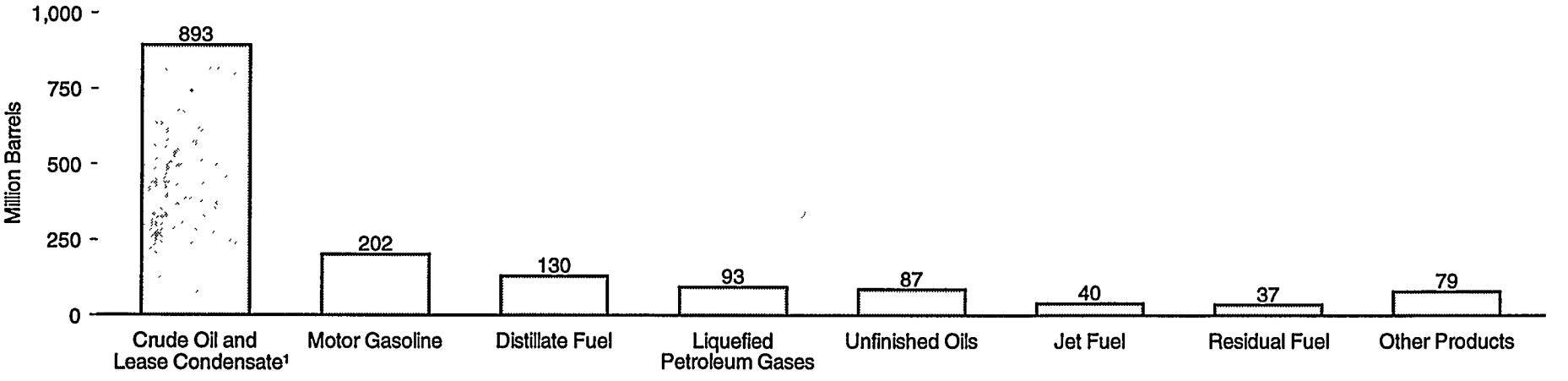
**Total, Products, and Crude Oil[1],1949-1995**




**SPR,[2] Non-SPR, and Total Stocks, 1949-1995**




**By Type, 1995**




[1] Includes crude oil stored in the Strategic Petroleum Reserve (SPR).
[2] See Figure 5.15 for additional Strategic Petroleum Reserve information.

Note: Because vertical scales differ, graphs should not be compared.
Sources: Tables 5.14 and 5.15.

# Table 5.14 Petroleum Primary Stocks by Type, End of Year 1949-1995

(Million Barrels)

| Year | Crude Oil and Lease Condensate | | | Petroleum Products | | | | | | | | | | | Total Petroleum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Strategic Petroleum Reserve | Other Primary | Total | Motor Gasoline [1] | Jet Fuel | Distillate Fuel Oil | | Residual Fuel Oil | Liquefied Petroleum Gases | | Unfinished Oils | Other Products [4] | Total Products | |
| | | | | | | Low Sulfur [2] | Total | | Propane [3] | Total | | | | |
| 1949 | 0 | 253 | 253 | 110 | NA | NA | 75 | 60 | ([5]) | 1 | 66 | 37 | 350 | 603 |
| 1950 | 0 | 248 | 248 | 116 | NA | NA | 72 | 41 | ([5]) | 2 | 70 | 34 | 334 | 583 |
| 1951 | 0 | 256 | 256 | 135 | NA | NA | 87 | 43 | ([5]) | 2 | 67 | 45 | 378 | 634 |
| 1952 | 0 | 272 | 272 | 135 | 2 | NA | 99 | 49 | ([5]) | 3 | 62 | 53 | 402 | 674 |
| 1953 | 0 | 274 | 274 | 158 | 3 | NA | 112 | 49 | ([5]) | 4 | 69 | 56 | 451 | 726 |
| 1954 | 0 | 258 | 258 | 155 | 3 | NA | 108 | 52 | ([5]) | 7 | 74 | 57 | 457 | 715 |
| 1955 | 0 | 266 | 266 | 165 | 3 | NA | 111 | 39 | ([5]) | 7 | 68 | 55 | 449 | 715 |
| 1956 | 0 | 266 | 266 | 187 | 5 | NA | 134 | 44 | ([5]) | 14 | 67 | 63 | 514 | 780 |
| 1957 | 0 | 282 | 282 | 197 | 5 | NA | 149 | 60 | ([5]) | 14 | 69 | 66 | 560 | 841 |
| 1958 | 0 | 263 | 263 | 187 | 6 | NA | 125 | 60 | ([5]) | 16 | 70 | 63 | 526 | 789 |
| 1959 | 0 | 257 | 257 | 188 | 8 | NA | 151 | 54 | ([5]) | 19 | 67 | 66 | 552 | 809 |
| 1960 | 0 | 240 | 240 | 195 | 7 | NA | 138 | 45 | ([5]) | 23 | 62 | 76 | 545 | 785 |
| 1961 | 0 | 245 | 245 | 184 | 8 | NA | 152 | 45 | ([5]) | 31 | 79 | 81 | 580 | 825 |
| 1962 | 0 | 252 | 252 | 189 | 10 | NA | 144 | 50 | ([5]) | 25 | 82 | 83 | 582 | 834 |
| 1963 | 0 | 237 | 237 | 191 | 9 | NA | 157 | 48 | ([5]) | 28 | 82 | 85 | 598 | 836 |
| 1964 | 0 | 230 | 230 | 186 | 19 | NA | 156 | 40 | ([5]) | 30 | 87 | 92 | 609 | 839 |
| 1965 | 0 | 220 | 220 | 175 | 19 | NA | 155 | 56 | ([5]) | 30 | 89 | 92 | 616 | 836 |
| 1966 | 0 | 238 | 238 | 186 | 19 | NA | 154 | 61 | ([5]) | 35 | 89 | 91 | 636 | 874 |
| 1967 | 0 | 249 | 249 | 200 | 22 | NA | 160 | 66 | ([5]) | 64 | 90 | 93 | 695 | 944 |
| 1968 | 0 | 272 | 272 | 204 | 24 | NA | 173 | 67 | ([5]) | 76 | 93 | 89 | 727 | 1,000 |
| 1969 | 0 | 265 | 265 | 211 | 28 | NA | 172 | 58 | ([5]) | 60 | 98 | 88 | 715 | 980 |
| 1970 | 0 | 276 | 276 | 209 | 28 | NA | 195 | 54 | ([5]) | 67 | 99 | 89 | 741 | 1,018 |
| 1971 | 0 | 260 | 260 | 219 | 28 | NA | 191 | 60 | ([5]) | 95 | 101 | 92 | 784 | 1,044 |
| 1972 | 0 | 246 | 246 | 213 | 25 | NA | 154 | 55 | ([5]) | 86 | 95 | 84 | 713 | 959 |
| 1973 | 0 | 242 | 242 | 209 | 29 | NA | 196 | 53 | ([5]) | 99 | 99 | 80 | 766 | 1,008 |
| 1974 | 0 | 265 | 265 | 218 | 29 | NA | 200 | 60 | ([5]) | 113 | 106 | 82 | 809 | 1,074 |
| 1975 | 0 | 271 | 271 | 235 | 30 | NA | 209 | 74 | ([5]) | 125 | 106 | 82 | 862 | 1,133 |
| 1976 | 0 | 285 | 285 | 231 | 32 | NA | 186 | 72 | ([5]) | 116 | 110 | 78 | 826 | 1,112 |
| 1977 | 7 | 340 | 348 | 258 | 35 | NA | 250 | 90 | ([5]) | 136 | 113 | 82 | 964 | 1,312 |
| 1978 | 67 | 309 | 376 | 238 | 34 | NA | 216 | 90 | ([5]) | 132 | 109 | 82 | 901 | 1,278 |
| 1979 | 91 | 339 | 430 | 237 | 39 | NA | 229 | 96 | ([5]) | 111 | 118 | 82 | 911 | 1,341 |
| 1980 | 108 | 358 | 466 | 261 | 42 | NA | 205 | 92 | ([5]) | 120 | 124 | 82 | 926 | 1,392 |
| 1981 | 230 | 363 | 594 | 253 | 41 | NA | 192 | 78 | ([5]) | 135 | 111 | 80 | 890 | 1,484 |
| 1982 | 294 | 350 | 644 | 235 | 37 | NA | 179 | 66 | ([5]) | 94 | 105 | 70 | 786 | 1,430 |
| 1983 | 379 | 344 | 723 | 222 | 39 | NA | 140 | 49 | ([5]) | 101 | 108 | 72 | 731 | 1,454 |
| 1984 | 451 | 345 | 796 | 243 | 42 | NA | 161 | 53 | 58 | 101 | 94 | 67 | 760 | 1,556 |
| 1985 | 493 | 321 | 814 | 223 | 40 | NA | 144 | 50 | 39 | 74 | 107 | 67 | 705 | 1,519 |
| 1986 | 512 | 331 | 843 | 233 | 50 | NA | 155 | 47 | 63 | 103 | 94 | 68 | 750 | 1,593 |
| 1987 | 541 | 349 | 890 | 226 | 50 | NA | 134 | 47 | 48 | 97 | 93 | 70 | 718 | 1,607 |
| 1988 | 560 | 330 | 890 | 228 | 44 | NA | 124 | 45 | 50 | 97 | 100 | 70 | 707 | 1,597 |
| 1989 | 580 | 341 | 921 | 213 | 41 | NA | 106 | 44 | 32 | 80 | 106 | 70 | 660 | 1,581 |
| 1990 | 586 | 323 | 908 | 220 | 52 | NA | 132 | 49 | 49 | 98 | 99 | 63 | 712 | 1,621 |
| 1991 | 569 | 325 | 893 | 219 | 49 | NA | 144 | 50 | 48 | 92 | 98 | 72 | 724 | 1,617 |
| 1992 | 575 | 318 | 893 | 216 | 43 | NA | 141 | 43 | 39 | 89 | 95 | 73 | 699 | 1,592 |
| 1993 | 587 | 335 | 922 | 226 | 40 | 64 | 141 | 44 | 51 | 106 | 88 | 78 | 725 | 1,647 |
| 1994 | 592 | 337 | 929 | 215 | 47 | R73 | 145 | 42 | R46 | R99 | 91 | R84 | R724 | R1,653 |
| 1995P | 592 | 302 | 893 | 202 | 40 | 66 | 130 | 37 | 43 | 93 | 87 | 79 | 668 | 1,561 |

[1] Prior to 1964, motor gasoline data were for total gasoline, which included motor gasoline, aviation gasoline, and special naphthas. For 1981 forward, includes motor gasoline blending components.

[2] Sulfur content of 0.05 percent or less by weight.

[3] Includes propylene.

[4] Kerosene, petrochemical feedstocks, lubricants, wax, petroleum coke, asphalt, road oil, pentanes plus, and miscellaneous products. Since 1964, aviation gasoline and special naphthas have been included. For 1981 forward, includes aviation gasoline blending components, hydrogen, other hydrocarbons, and alcohol.

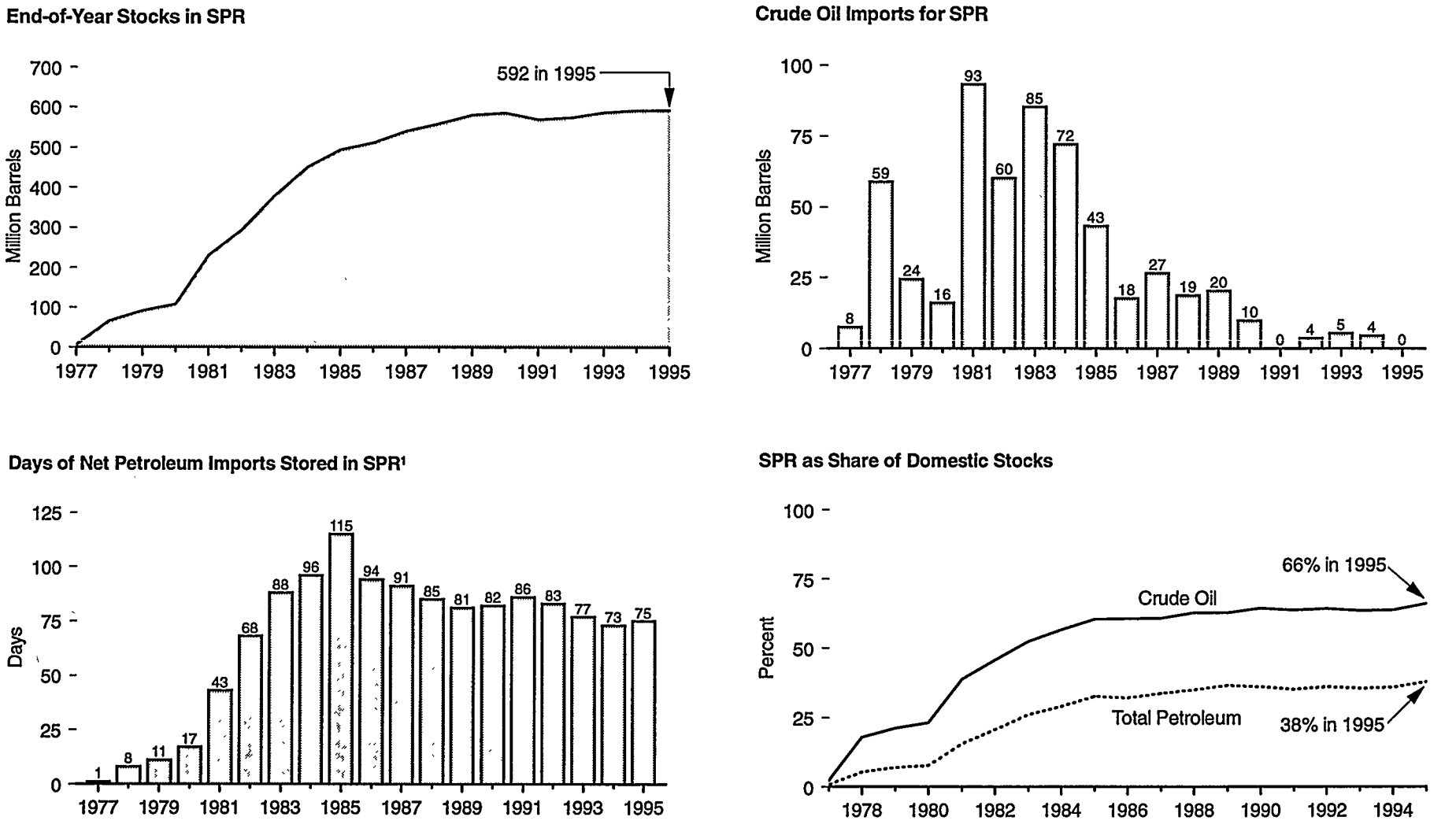
[5] Included in liquefied petroleum gases total.

R=Revised data. P=Preliminary data. NA=Not available.

Note: Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.15 Strategic Petroleum Reserve, 1977-1995




[1] Derived by dividing end-of-year Strategic Petroleum Reserve stocks by average daily net imports of all petroleum.

Notes: • SPR=Strategic Petroleum Reserve.

• Because vertical scales differ, graphs should not be compared.

Source: Table 5.15.

# Table 5.15 Strategic Petroleum Reserve, 1977-1995

(Million Barrels, Except as Noted)

| Year | Crude Oil Imports | Domestic Crude Oil Deliveries | Domestic Crude Oil Sales | End-of-Year Stocks | | | Days of Net Petroleum Imports [3] |
|---|---|---|---|---|---|---|---|
| | | | | Quantity [1] | Share of Crude Oil [2] Stocks (percent) | Share of Total Petroleum Stocks (percent) | |
| 1977 | 7.54 | [4]0.37 | 0.00 | 7.46 | 2.1 | 0.6 | 1 |
| 1978 | 58.80 | 0.00 | 0.00 | 66.86 | 17.8 | 5.2 | 8 |
| 1979 | 24.43 | (s) | 0.00 | 91.19 | 21.2 | 6.8 | 11 |
| 1980 | 16.07 | 1.30 | 0.00 | 107.80 | 23.1 | 7.7 | 17 |
| 1981 | 93.30 | 28.79 | 0.00 | 230.34 | 38.8 | 15.5 | 43 |
| 1982 | 60.19 | 3.79 | 0.00 | 293.83 | 45.7 | 20.5 | 68 |
| 1983 | 85.29 | 0.42 | 0.00 | 379.09 | 52.4 | 26.1 | 88 |
| 1984 | 72.04 | 0.05 | 0.00 | 450.51 | 56.6 | 28.9 | 96 |
| 1985 | 43.12 | 0.17 | 0.00 | 493.32 | 60.6 | 32.5 | 115 |
| 1986 | 17.56 | 1.21 | 0.00 | 511.57 | 60.7 | 32.1 | 94 |
| 1987 | 26.52 | 2.69 | 0.00 | 540.65 | 60.8 | 33.6 | 91 |
| 1988 | 18.76 | 0.01 | 0.00 | 559.52 | 62.9 | 35.0 | 85 |
| 1989 | 20.35 | 0.00 | 0.00 | 579.86 | 62.9 | 36.7 | 81 |
| 1990 | 9.77 | 0.00 | 3.91 | 585.69 | 64.5 | 36.1 | 82 |
| 1991 | 0.00 | 0.00 | 17.22 | 568.51 | 63.7 | 35.2 | 86 |
| 1992 | 3.59 | 2.60 | 0.00 | 574.72 | 64.4 | 36.1 | 83 |
| 1993 | 5.37 | 6.96 | 0.00 | 587.08 | 63.6 | 35.6 | R77 |
| 1994 | 4.49 | 0.11 | 0.00 | 591.67 | 63.7 | 35.8 | R73 |
| 1995 | 0.00 | 0.00 | 0.00 | 591.64 | 66.2 | 37.9 | 75 |

[1] Stocks do not include imported quantities in transit to Strategic Petroleum Reserve terminals, pipeline fill, and above-ground storage.

[2] Including lease condensate stocks.

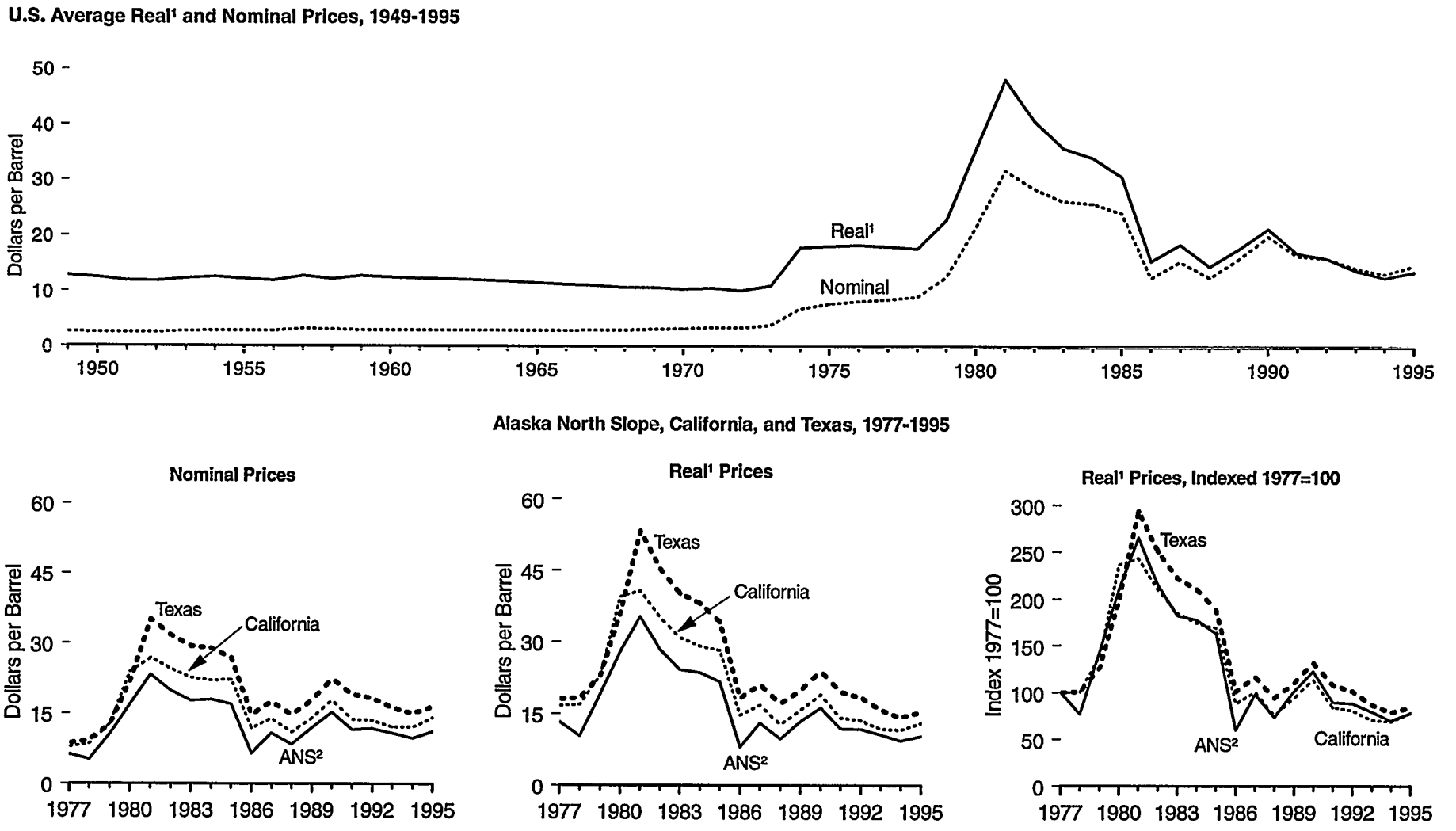
[3] Derived by dividing end-of-year Strategic Petroleum Reserve stocks by annual average daily net imports of all petroleum. Calculated prior to rounding.

[4] The quantity of domestic fuel oil which was in storage prior to injection of foreign crude oil.

R=Revised data. (s)=Less than 0.005 million barrels.

Sources: **Domestic Crude Oil Deliveries and Domestic Crude Oil Sales:** U.S. Department of Energy, Assistant Secretary for Fossil Energy, unpublished data. **All Other Data:** • 1977-1980—Energy Information Administration (EIA), Energy Data Report, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

# Figure 5.16 Crude Oil Domestic First Purchase Prices




[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[2] Alaska North Slope.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 5.16.

# Table 5.16 Crude Oil Domestic First Purchase Prices, 1949-1995

(Dollars per Barrel)

| Year | Alaska North Slope | | California | | Texas | | U.S. Average | |
|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] |
| 1949 | — | — | — | — | — | — | 2.54 | (2) |
| 1950 | — | — | — | — | — | — | 2.51 | (2) |
| 1951 | — | — | — | — | — | — | 2.53 | (2) |
| 1952 | — | — | — | — | — | — | 2.53 | (2) |
| 1953 | — | — | — | — | — | — | 2.68 | (2) |
| 1954 | — | — | — | — | — | — | 2.78 | (2) |
| 1955 | — | — | — | — | — | — | 2.77 | (2) |
| 1956 | — | — | — | — | — | — | 2.79 | (2) |
| 1957 | — | — | — | — | — | — | 3.09 | (2) |
| 1958 | — | — | — | — | — | — | 3.01 | (2) |
| 1959 | — | — | — | — | — | — | 2.90 | R12.66 |
| 1960 | — | — | — | — | — | — | 2.88 | R12.36 |
| 1961 | — | — | — | — | — | — | 2.89 | R12.25 |
| 1962 | — | — | — | — | — | — | 2.90 | R12.13 |
| 1963 | — | — | — | — | — | — | 2.89 | R11.94 |
| 1964 | — | — | — | — | — | — | 2.88 | R11.76 |
| 1965 | — | — | — | — | — | — | 2.86 | R11.44 |
| 1966 | — | — | — | — | — | — | 2.88 | R11.21 |
| 1967 | — | — | — | — | — | — | 2.92 | R11.02 |
| 1968 | — | — | — | — | — | — | 2.94 | R10.61 |
| 1969 | — | — | — | — | — | — | 3.09 | R10.66 |
| 1970 | — | — | — | — | — | — | 3.18 | R10.39 |
| 1971 | — | — | — | — | — | — | 3.39 | R10.53 |
| 1972 | — | — | — | — | — | — | 3.39 | R10.12 |
| 1973 | — | — | — | — | — | — | 3.89 | R10.99 |
| 1974 | — | — | — | — | — | — | 6.87 | R17.84 |
| 1975 | — | — | — | — | — | — | 7.67 | R18.18 |
| 1976 | — | — | — | — | — | — | 8.19 | R18.36 |
| 1977 | [3]6.29 | [3]13.27 | 7.92 | R16.71 | 8.58 | R18.10 | 8.57 | R18.08 |
| 1978 | 5.21 | R10.22 | 8.58 | R16.82 | 9.29 | R18.22 | 9.00 | R17.65 |
| 1979 | 10.57 | R19.11 | 12.78 | R23.11 | 12.65 | R22.88 | 12.64 | R22.86 |
| 1980 | 16.87 | R27.93 | 23.87 | R39.52 | 21.84 | R36.16 | 21.59 | R35.75 |
| 1981 | 23.23 | R35.25 | 26.80 | R40.67 | 35.06 | R53.20 | 31.77 | R48.21 |
| 1982 | 19.92 | R28.42 | 24.58 | R35.06 | 31.77 | R45.32 | 28.52 | R40.68 |
| 1983 | 17.69 | R24.20 | 22.61 | R30.93 | 29.35 | R40.15 | 26.19 | R35.83 |
| 1984 | 17.91 | R23.60 | 22.09 | R29.10 | 28.87 | R38.04 | 25.88 | R34.10 |
| 1985 | 16.98 | R21.66 | 22.14 | R28.24 | 26.80 | R34.18 | 24.09 | R30.73 |
| 1986 | 6.45 | R8.00 | 11.90 | R14.76 | 14.73 | R18.28 | 12.51 | R15.52 |
| 1987 | 10.83 | R13.03 | 13.92 | R16.75 | 17.55 | R21.12 | 15.40 | R18.53 |
| 1988 | 8.43 | R9.79 | 10.97 | R12.74 | 14.71 | R17.08 | 12.58 | R14.61 |
| 1989 | 12.00 | R13.38 | 14.06 | R15.67 | 17.81 | R19.86 | 15.86 | R17.68 |
| 1990 | 15.23 | R16.27 | 17.81 | R19.03 | 22.37 | R23.90 | 20.03 | R21.40 |
| 1991 | 11.57 | R11.89 | 13.72 | R14.10 | 19.04 | R19.57 | 16.54 | R17.00 |
| 1992 | 11.73 | R11.73 | 13.55 | R13.55 | 18.32 | R18.32 | 15.99 | R15.99 |
| 1993 | 10.84 | R10.57 | 12.11 | R11.80 | 16.19 | R15.78 | 14.25 | R13.89 |
| 1994 | 9.77 | R9.30 | 12.12 | R11.54 | 14.98 | R14.27 | 13.19 | R12.56 |
| 1995[P] | 11.12 | 10.34 | 14.00 | 13.02 | 16.39 | 15.25 | 14.62 | 13.60 |

[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[2] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal dollars to real (inflation-adjusted) values, were not available in time to use in this report.

[3] Average for July through December only.

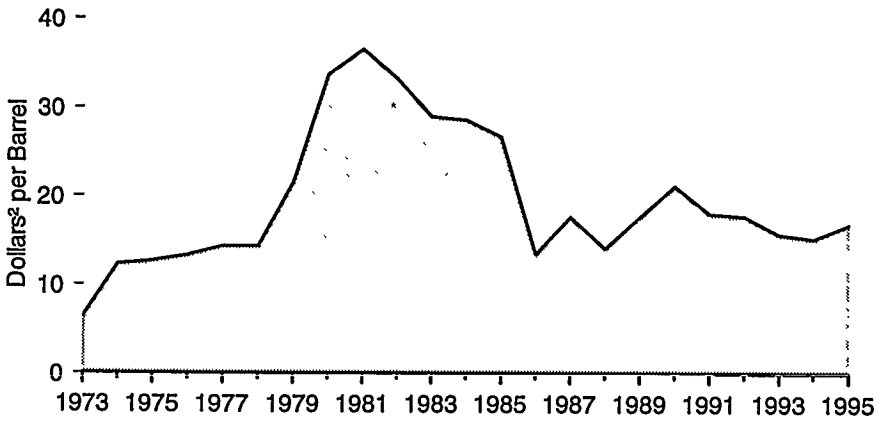
P=Preliminary data. NA=Not available. — = Not applicable.

Note: For the definition of crude oil domestic first purchase prices, see Note 5 at end of section.

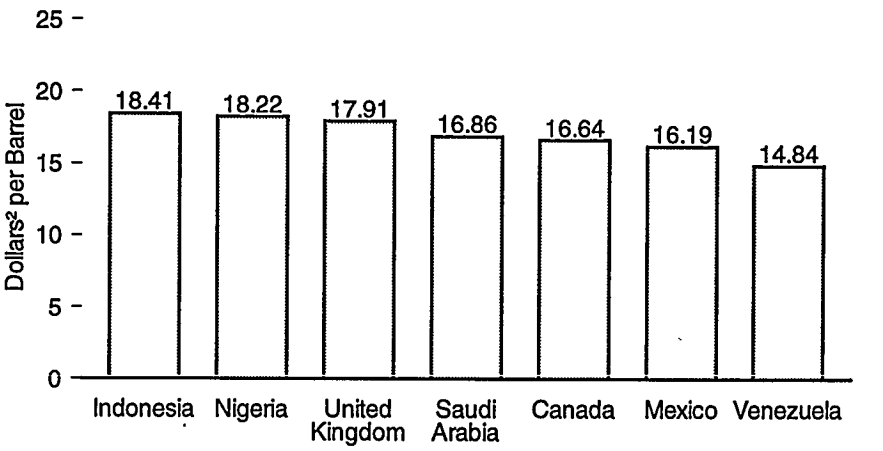
Sources: • 1949-1973—Bureau of Mines, *Minerals Yearbook*, "Crude Petroleum and Petroleum Products" chapter. • 1974 through January 1976—Federal Energy Administration (FEA), Form FEA-90, "Crude Petroleum Production Monthly Report." • February 1976 through September 1979—FEA, Form FEA-P-124, "Domestic Crude Oil Purchaser's Monthly Report." • October 1979 through 1982—Economic Regulatory Administration, Form ERA-182, "Domestic Crude Oil First Purchase Report." • 1983 forward—Energy Information Administration, Form EIA-182, "Domestic Crude Oil First Purchase Report."

# Figure 5.17 Landed Costs of Crude Oil Imports From Selected Countries

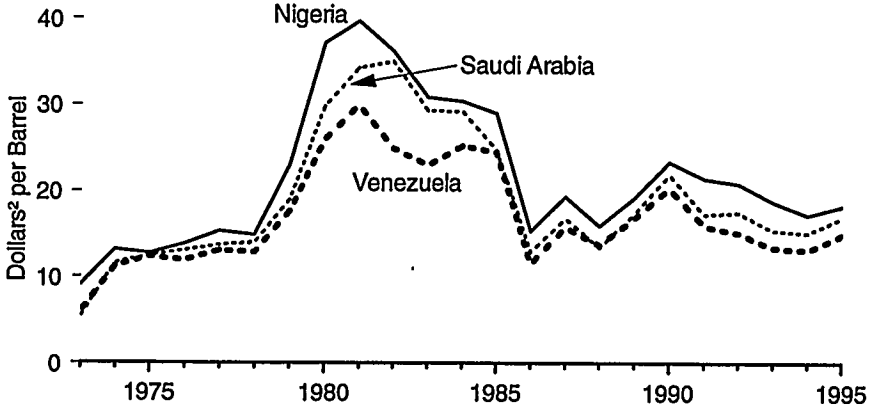
**Total, 1973[1]-1995**



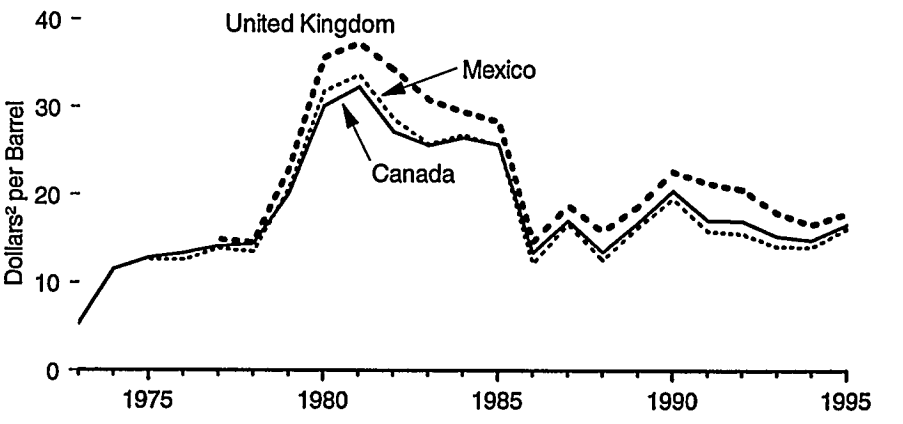

**By Selected Country, 1995**




**By Selected OPEC Country, 1973[1]-1995**




**By Selected Non-OPEC Country, 1973[1]-1995**




[1] Based on October, November, and December data only.
[2] Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 5.17.

# Table 5.17 Landed Costs of Crude Oil Imports From Selected Countries, 1973-1995

(Dollars[1] per Barrel)

| Year | OPEC[2] | | | | | | | | Non-OPEC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Algeria | Indonesia | Nigeria | Saudi Arabia | Venezuela | Other[3] | Total[4] | Arab OPEC[5] | Canada | Mexico | United Kingdom | Other | Total |
| 1973[6] | 8.39 | 7.22 | 9.08 | 5.37 | 5.99 | 6.55 | 6.85 | 5.92 | 5.33 | NA | NA | 7.51 | 6.41 |
| 1974 | 13.97 | 13.20 | 13.16 | 11.63 | 11.25 | 12.61 | 12.49 | 12.39 | 11.48 | W | NA | 12.98 | 12.32 |
| 1975 | 12.86 | 13.83 | 12.70 | 12.50 | 12.36 | 12.66 | 12.70 | 12.71 | 12.84 | 12.61 | NA | 12.41 | 12.70 |
| 1976 | 13.90 | 13.85 | 13.81 | 13.06 | 11.89 | 13.16 | 13.32 | 13.31 | 13.36 | 12.64 | W | 13.48 | 13.32 |
| 1977 | 15.24 | 14.65 | 15.29 | 13.69 | 13.11 | 14.25 | 14.35 | 14.30 | 14.13 | 13.82 | 14.83 | 14.70 | 14.36 |
| 1978 | 14.93 | 14.65 | 14.88 | 13.94 | 12.84 | 14.31 | 14.34 | 14.36 | 14.41 | 13.56 | 14.53 | 14.74 | 14.35 |
| 1979 | 21.88 | 20.63 | 22.97 | 18.95 | 17.65 | 23.12 | 21.29 | 20.79 | 20.22 | 20.77 | 22.97 | 23.21 | 21.45 |
| 1980 | 37.92 | 33.92 | 37.15 | 29.80 | 25.92 | 36.08 | 33.56 | 32.97 | 30.11 | 31.77 | 35.68 | 36.16 | 33.67 |
| 1981 | 40.46 | 37.31 | 39.66 | 34.20 | 29.91 | 39.06 | 36.60 | 36.22 | 32.32 | 33.70 | 37.29 | 38.08 | 36.47 |
| 1982 | 35.35 | 36.70 | 36.16 | 34.99 | 24.93 | 34.13 | 34.81 | 35.15 | 27.15 | 28.63 | 34.25 | 33.87 | 33.18 |
| 1983 | 31.26 | 31.57 | 30.85 | 29.27 | 22.94 | 29.29 | 29.84 | 29.87 | 25.63 | 25.78 | 30.87 | 29.87 | 28.93 |
| 1984 | 29.06 | 30.87 | 30.36 | 29.20 | 25.19 | 28.85 | 29.06 | 29.10 | 26.56 | 26.85 | 29.45 | 29.33 | 28.54 |
| 1985 | 27.51 | 28.67 | 28.96 | 24.72 | 24.43 | 26.58 | 26.86 | 25.90 | 25.71 | 25.63 | 28.36 | 27.47 | 26.67 |
| 1986 | 14.82 | 14.63 | 15.29 | 12.84 | 11.52 | 13.42 | 13.46 | 13.14 | 13.43 | 12.17 | 14.63 | 14.49 | 13.49 |
| 1987 | 17.87 | 18.49 | 19.32 | 16.81 | 15.76 | 18.12 | 17.64 | 17.32 | 17.04 | 16.69 | 18.78 | 18.43 | 17.65 |
| 1988 | W | 15.15 | 15.88 | 13.37 | 13.66 | 13.83 | 14.18 | 13.60 | 13.50 | 12.58 | 15.82 | 14.88 | 14.08 |
| 1989 | 19.13 | 18.35 | 19.19 | 17.34 | 16.78 | 17.56 | 17.78 | 17.41 | 16.81 | 16.35 | 18.74 | 18.51 | 17.68 |
| 1990 | W | 22.50 | 23.33 | 21.82 | 20.31 | 18.65 | 21.23 | 20.64 | 20.48 | 19.64 | 22.65 | 21.96 | 21.13 |
| 1991 | W | 20.20 | 21.39 | 17.22 | 15.92 | 18.91 | 18.08 | 17.45 | 17.16 | 15.89 | 21.37 | 19.90 | 18.02 |
| 1992 | W | 18.76 | 20.78 | 17.48 | 15.13 | 19.15 | 17.81 | 17.63 | 17.04 | 15.60 | 20.63 | 19.29 | 17.75 |
| 1993 | 17.34 | 18.55 | 18.73 | 15.40 | 13.39 | 15.45 | 15.68 | 15.28 | 15.27 | 14.11 | 17.92 | 16.98 | 15.72 |
| 1994 | W | R16.91 | R17.21 | R15.11 | R13.12 | R15.26 | R15.08 | R15.02 | 14.83 | R14.09 | 16.64 | R16.26 | R15.18 |
| 1995P | W | 18.41 | 18.22 | 16.86 | 14.84 | 17.30 | 16.62 | 16.82 | 16.64 | 16.19 | 17.91 | 17.55 | 16.77 |

[1] Nominal dollars.

[2] Organization of Petroleum Exporting Countries (OPEC). See Glossary for membership.

[3] Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates; Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[4] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[5] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

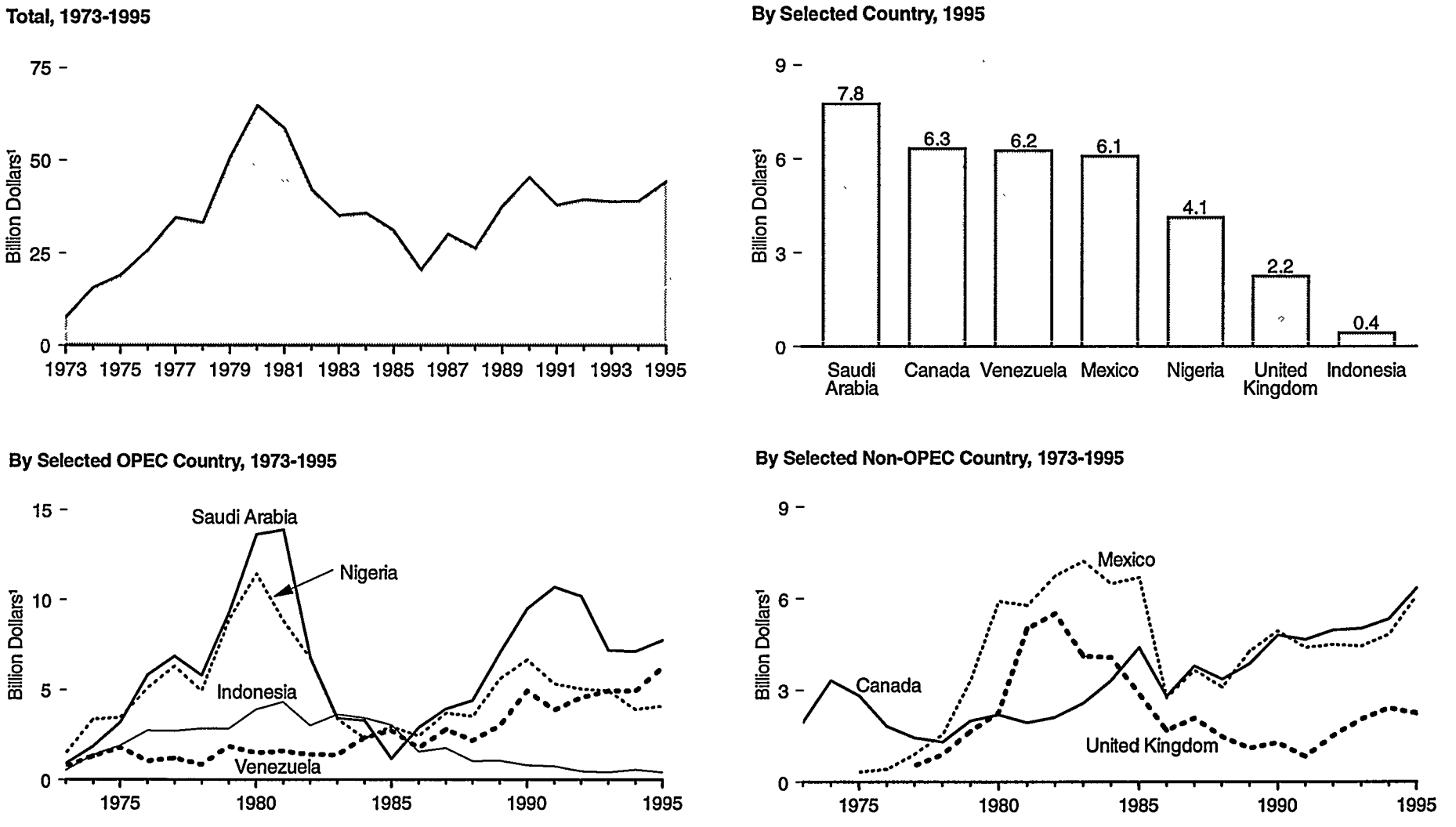
[6] Based on October, November, and December data only.

R=Revised data. P=Preliminary data. NA=Not available, included in "Other Non-OPEC." W=Value withheld to avoid disclosure of individual company data.

Notes: • Data include imports for the Strategic Petroleum Reserve, which began in 1977. • Totals may not equal sum of components due to independent rounding.

Sources: • 1973 through September 1977—Federal Energy Administration, Form FEA-F701-M-0, "Transfer Pricing Report." • October 1977 through January 1979—Energy Information Administration (EIA), Form FEA-F701-M-0, "Transfer Pricing Report." • February 1979 through September 1982—EIA, Form ERA-51, "Transfer Pricing Report." • October 1982 through June 1984—EIA, Form EP-51, "Foreign Crude Oil Transaction Report." • July 1984 forward—EIA, Form EIA-856, "Monthly Foreign Crude Oil Acquisition Report."

# Figure 5.18 Value of Crude Oil Imports From Selected Countries




[1] Nominal dollars.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 5.18.

# Table 5.18 Value of Crude Oil Imports From Selected Countries, 1973-1995

(Billion Dollars[1])

| Year | OPEC[2] | | | | | | | | Non-OPEC | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Algeria | Indonesia | Nigeria | Saudi Arabia | Venezuela | Other[3] | Total[4] | Arab OPEC[5] | Canada | Mexico | United Kingdom | Other | Total[6] |
| 1973 | 0.4 | 0.5 | 1.5 | 0.9 | 0.8 | 1.2 | 5.2 | 1.8 | 1.9 | NA | NA | 0.4 | 7.6 |
| 1974 | 0.9 | 1.4 | 3.3 | 1.9 | 1.3 | 2.9 | 11.6 | 3.2 | 3.3 | W | NA | 0.7 | 15.6 |
| 1975 | 1.2 | 1.9 | 3.5 | 3.2 | 1.8 | 3.4 | 14.9 | 6.2 | 2.8 | 0.3 | NA | 1.0 | 19.0 |
| 1976 | 2.1 | 2.7 | 5.1 | 5.8 | 1.0 | 5.4 | 22.2 | 11.6 | 1.8 | 0.4 | W | 1.3 | 25.8 |
| 1977 | 3.0 | 2.7 | 6.3 | 6.9 | 1.2 | 9.6 | 29.6 | 16.4 | 1.4 | 0.9 | 0.5 | 2.2 | 34.7 |
| 1978 | 3.5 | 2.9 | 4.9 | 5.8 | 0.8 | 9.3 | 27.1 | 15.4 | 1.3 | 1.6 | 0.9 | 2.4 | 33.3 |
| 1979 | 4.9 | 2.9 | 9.0 | 9.3 | 1.9 | 12.0 | 39.7 | 22.8 | 2.0 | 3.3 | 1.7 | 4.2 | 51.0 |
| 1980 | 6.3 | 3.9 | 11.4 | 13.6 | 1.5 | 11.2 | 47.5 | 30.2 | 2.2 | 5.9 | 2.3 | 6.9 | 64.9 |
| 1981 | 3.9 | 4.3 | 8.8 | 13.9 | 1.6 | 6.7 | 39.0 | 23.4 | 1.9 | 5.8 | 5.0 | 6.5 | 58.5 |
| 1982 | 1.2 | 3.0 | 6.7 | 6.8 | 1.4 | 2.8 | 22.0 | 9.4 | 2.1 | 6.7 | 5.5 | 5.6 | 42.2 |
| 1983 | 2.0 | 3.6 | 3.4 | 3.4 | 1.4 | 2.1 | 16.1 | 5.8 | 2.6 | 7.2 | 4.1 | 4.9 | 35.2 |
| 1984 | 2.1 | 3.4 | 2.3 | 3.3 | 2.3 | 2.6 | 16.1 | 6.7 | 3.3 | 6.5 | 4.1 | 5.8 | 35.8 |
| 1985 | 0.8 | 3.1 | 3.0 | 1.2 | 2.7 | 2.1 | 12.9 | 2.8 | 4.4 | 6.7 | 2.9 | 4.3 | 31.2 |
| 1986 | 0.4 | 1.6 | 2.4 | 2.9 | 1.8 | 1.3 | 10.4 | 4.1 | 2.8 | 2.8 | 1.7 | 2.9 | 20.6 |
| 1987 | 0.7 | 1.8 | 3.7 | 3.9 | 2.8 | 2.4 | 15.5 | 6.1 | 3.8 | 3.7 | 2.1 | 5.1 | 30.1 |
| 1988 | W | 1.0 | 3.5 | 4.4 | 2.2 | 2.5 | 14.0 | 7.0 | 3.4 | 3.1 | 1.5 | 4.4 | 26.3 |
| 1989 | 0.4 | 1.1 | 5.6 | 7.1 | 3.0 | 4.8 | 21.9 | 11.4 | 3.9 | 4.3 | 1.1 | 6.5 | 37.7 |
| 1990 | W | 0.8 | 6.7 | 9.5 | 4.9 | 4.8 | 27.2 | 14.0 | 4.8 | 4.9 | 1.3 | 7.2 | 45.5 |
| 1991 | W | 0.8 | 5.3 | 10.7 | 3.9 | 1.2 | 22.3 | 11.2 | 4.7 | 4.4 | 0.8 | 5.8 | 38.0 |
| 1992 | W | 0.5 | 5.1 | 10.2 | 4.6 | 1.6 | 22.2 | 10.7 | 5.0 | 4.5 | 1.5 | 6.3 | 39.5 |
| 1993 | 0.2 | 0.4 | 4.9 | 7.2 | 4.9 | 2.9 | 20.7 | 9.3 | 5.0 | 4.4 | 2.0 | 6.8 | 38.9 |
| 1994 | W | 0.6 | 3.9 | R7.2 | R5.0 | R2.9 | R19.7 | R9.0 | R5.3 | 4.8 | 2.4 | 6.9 | R39.1 |
| 1995P | W | 0.4 | 4.1 | 7.8 | 6.2 | 2.8 | 21.7 | 9.2 | 6.3 | 6.1 | 2.2 | 8.1 | 44.3 |

[1] Nominal dollars.

[2] Organization of Petroleum Exporting Countries. See Glossary for membership.

[3] Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and United Arab Emirates; Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Prior to 1988, imports from the Neutral Zone between Kuwait and Saudi Arabia were included in imports from Saudi Arabia. From 1988 forward, those imports have been included in imports from "Other."

[4] Ecuador, which withdrew from OPEC on December 31, 1992, is included through 1992. Total OPEC imports exclude petroleum imported into the United States indirectly from OPEC countries, primarily from Caribbean and West European refining areas, as petroleum products that were refined from crude oil produced in OPEC countries.

[5] Algeria, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. Imports from the Neutral Zone are included in imports from "Arab OPEC."

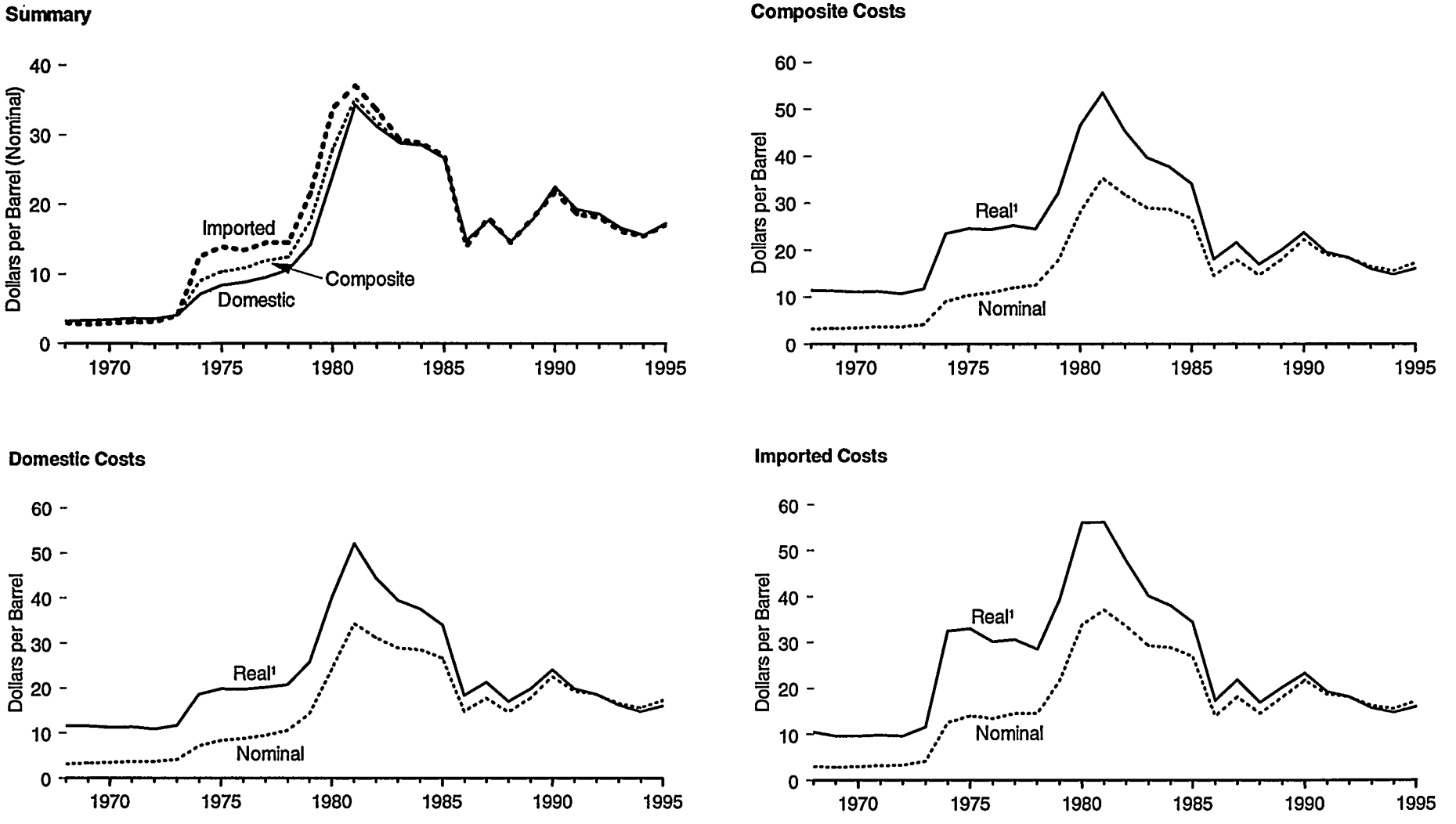
[6] Data shown here represent landed value; they differ from data in Table 3.5, which are data from U.S. Customs that represent crude oil value at the port of loading.

R=Revised data. P=Preliminary data. NA=Not available, included in "Other Non-OPEC." W=Value withheld to avoid disclosure of individual company data.

Note: Because the volumes associated with the landed costs are not the same as those used in the calculation of this table, the value of imports do not sum. The values were calculated independently.

Sources: Calculated by using prices on Table 5.17 and volume data as follows: • 1973-1975—U.S. Department of the Interior, Bureau of Mines, *Petroleum Statement, Annual.* • 1976-1980—Energy Information Administration (EIA), *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Petroleum Supply Monthly* (February 1996).

## Figure 5.19 Crude Oil Refiner Acquisition Costs, 1968-1995




¹ In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 5.19.

# Table 5.19 Crude Oil Refiner Acquisition Costs, 1968-1995

(Dollars per Barrel)

| Year | Domestic | | Imported | | Composite | |
|---|---|---|---|---|---|---|
| | Nominal | Real [1] | Nominal | Real [1] | Nominal | Real [1] |
| 1968 | 3.21 | R11.59 | 2.90 | R10.47 | 3.17 | R11.44 |
| 1969 | 3.37 | R11.62 | 2.80 | R9.66 | 3.29 | R11.34 |
| 1970 | 3.46 | R11.31 | 2.96 | R9.67 | 3.40 | R11.11 |
| 1971 | 3.68 | R11.43 | 3.17 | R9.84 | 3.60 | R11.18 |
| 1972 | 3.67 | R10.96 | 3.22 | R9.61 | 3.58 | R10.69 |
| 1973 | 4.17 | R11.78 | 4.08 | R11.53 | 4.15 | R11.72 |
| 1974 | 7.18 | R18.65 | 12.52 | R32.52 | 9.07 | R23.56 |
| 1975 | 8.39 | R19.88 | 13.93 | R33.01 | 10.38 | R24.60 |
| 1976 | 8.84 | R19.82 | 13.48 | R30.22 | 10.89 | R24.42 |
| 1977 | 9.55 | R20.15 | 14.53 | R30.65 | 11.96 | R25.23 |
| 1978 | 10.61 | R20.80 | 14.57 | R28.57 | 12.46 | R24.43 |
| 1979 | 14.27 | R25.80 | 21.67 | R39.19 | 17.72 | R32.04 |
| 1980 | 24.23 | R40.12 | 33.89 | R56.11 | 28.07 | R46.47 |
| 1981 | 34.33 | R52.09 | 37.05 | R56.22 | 35.24 | R53.47 |
| 1982 | 31.22 | R44.54 | 33.55 | R47.86 | 31.87 | R45.46 |
| 1983 | 28.87 | R39.49 | 29.30 | R40.08 | 28.99 | R39.66 |
| 1984 | 28.53 | R37.59 | 28.88 | R38.05 | 28.63 | R37.72 |
| 1985 | 26.66 | R34.01 | 26.99 | R34.43 | 26.75 | R34.12 |
| 1986 | 14.82 | R18.39 | 14.00 | R17.37 | 14.55 | R18.05 |
| 1987 | 17.76 | R21.37 | 18.13 | R21.82 | 17.90 | R21.54 |
| 1988 | 14.74 | R17.12 | 14.56 | R16.91 | 14.67 | R17.04 |
| 1989 | 17.87 | R19.92 | 18.08 | R20.16 | 17.97 | R20.03 |
| 1990 | 22.59 | R24.13 | 21.76 | R23.25 | 22.22 | R23.74 |
| 1991 | 19.33 | R19.87 | 18.70 | R19.22 | 19.06 | R19.59 |
| 1992 | 18.63 | R18.63 | 18.20 | R18.20 | 18.43 | R18.43 |
| 1993 | 16.67 | R16.25 | 16.14 | R15.73 | 16.41 | R15.99 |
| 1994 | R15.67 | R14.92 | 15.51 | R14.77 | 15.59 | R14.85 |
| 1995P | 17.33 | 16.12 | 17.13 | 15.93 | 17.23 | 16.03 |

[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

R=Revised data. P=Preliminary data.

Note: Refiner acquisition cost of crude oil for each category and for the composite is derived by dividing the sum of the total purchasing (acquisition) costs of all refiners by the total volume of all refiners' purchases.

Sources: • 1968-1973—Estimated. See Note 6 at end of section. • 1974 through January 1976—Federal Energy Administration (FEA), Form FEA-96, "Monthly Cost Allocation Report." • February 1976 through September 1977—FEA, Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • October 1977 through June 1978—Energy Information Administration (EIA), Form FEA-P110-M-1, "Refiners' Monthly Cost Allocation Report." • July 1978 through December 1980—EIA, Form ERA-49, "Domestic Crude Oil Entitlements Program Refiners Monthly Report." • 1981 forward—EIA, Form EIA-14, "Refiners' Monthly Cost Report."

## Figure 5.20 Refiner Sales Prices of Selected Petroleum Products, 1980-1995

[1] Nominal dollars.

Source: Table 5.20.

# Table 5.20 Refiner Sales Prices and Refiner Margins of Selected Petroleum Products, 1980-1995

(Cents[1] per Gallon, Excluding Taxes)

| Product | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sales Prices to Resellers:** [2] | | | | | | | | | | | | | | | | |
| Aviation Gasoline | 112.8 | 125.0 | 122.8 | 117.8 | 116.5 | 113.0 | 91.2 | 85.9 | 85.0 | 95.0 | 106.3 | 100.1 | 99.1 | 96.5 | 93.3 | 97.5 |
| Motor Gasoline | 94.1 | 106.4 | 97.3 | 88.2 | 83.2 | 83.5 | 53.1 | 58.9 | 57.7 | 65.4 | 78.6 | 69.9 | 67.7 | 62.6 | 59.9 | 62.6 |
| Leaded Regular | NA | NA | NA | 85.0 | 79.5 | 79.3 | 50.1 | 56.5 | 54.8 | 63.1 | 75.4 | 65.7 | 69.3 | NA | NA | NA |
| Unleaded Regular | NA | NA | NA | 89.5 | 84.2 | 84.3 | 52.2 | 56.9 | 54.8 | 61.8 | 75.8 | 67.2 | 64.5 | 59.3 | 56.6 | 59.3 |
| Unleaded Midgrade | NA | NA | NA | NA | NA | NA | NA | NA | NA | 68.6 | 81.4 | 73.3 | 70.8 | 66.0 | 63.8 | 67.0 |
| Premium | NA | NA | NA | 96.4 | 91.6 | 92.2 | 61.0 | 67.1 | 67.2 | 74.9 | 87.4 | 79.2 | 77.4 | 72.2 | 69.5 | 72.2 |
| Kerosene | 86.4 | 106.6 | 101.8 | 89.2 | 91.6 | 87.4 | 60.6 | 59.2 | 54.9 | 66.9 | 83.9 | 72.2 | 63.2 | 60.4 | 61.8 | 58.0 |
| Jet Fuel, Kerosene-Type | 86.8 | 101.2 | 95.3 | 85.4 | 83.0 | 79.4 | 49.5 | 53.8 | 49.5 | 58.3 | 77.3 | 65.0 | 60.5 | 57.7 | 53.4 | 53.9 |
| No. 1 Distillate Fuel Oil | 88.0 | 107.1 | 103.8 | 89.6 | 89.2 | 86.3 | 57.9 | 59.9 | 54.9 | 66.8 | 83.8 | 73.0 | 65.2 | 64.6 | R61.5 | 62.5 |
| No. 2 Distillate Fuel Oil | 80.2 | 97.4 | 91.4 | 81.2 | 81.3 | 77.4 | 47.0 | 53.1 | 47.3 | 56.6 | 69.5 | 61.8 | 58.5 | 55.9 | 52.2 | 53.0 |
| No. 2 Fuel Oil | 80.3 | 97.6 | 91.4 | 81.5 | 82.1 | 77.6 | 48.6 | 52.7 | 47.3 | 56.5 | 69.7 | 62.2 | 57.9 | 54.4 | 50.6 | 51.1 |
| No. 2 Diesel Oil | 80.1 | 97.2 | 91.4 | 80.8 | 80.3 | 77.2 | 45.2 | 53.4 | 47.3 | 56.7 | 69.4 | 61.5 | 59.1 | 57.0 | 52.9 | 53.8 |
| No. 4 Distillate Fuel Oil [3] | 67.0 | 78.3 | 73.7 | 72.6 | 70.7 | 67.2 | 40.9 | 46.2 | 42.5 | 48.0 | 59.0 | 55.6 | 49.5 | 48.8 | R46.2 | 46.3 |
| Residual Fuel Oil | 52.8 | 66.3 | 61.2 | 60.9 | 65.4 | 57.7 | 30.5 | 38.5 | 30.0 | 36.0 | 41.3 | 31.4 | 30.8 | 29.3 | R31.7 | 36.2 |
| 1% or Less Sulfur Content | 60.8 | 74.8 | 69.5 | 64.3 | 68.5 | 61.0 | 32.8 | 41.2 | 33.3 | 40.7 | 47.2 | 36.4 | 35.1 | 33.7 | 34.5 | 38.1 |
| Greater than 1% Sulfur Content | 47.9 | 62.2 | 57.2 | 59.1 | 63.9 | 56.0 | 28.9 | 36.2 | 27.1 | 33.1 | 37.2 | 29.2 | 28.6 | 25.6 | R28.7 | 33.8 |
| Propane (Consumer Grade) | 41.5 | 46.6 | 42.7 | 48.4 | 45.0 | 39.8 | 29.0 | 25.2 | 24.0 | 24.7 | 38.6 | 34.9 | 32.8 | 35.1 | R32.4 | 34.4 |
| **Sale Prices to End Users:** [2] | | | | | | | | | | | | | | | | |
| Aviation Gasoline | 108.4 | 130.3 | 131.2 | 125.5 | 123.4 | 120.1 | 101.1 | 90.7 | 89.1 | 99.5 | 112.0 | 104.7 | 102.7 | 99.0 | R95.7 | 100.5 |
| Motor Gasoline | 103.5 | 114.7 | 106.0 | 95.4 | 90.7 | 91.2 | 62.4 | 66.9 | 67.3 | 75.6 | 88.3 | 79.7 | 78.7 | 75.9 | 73.8 | 76.5 |
| Leaded Regular | NA | NA | NA | 90.6 | 84.8 | 84.2 | 57.3 | 61.8 | 61.9 | 71.0 | 83.1 | 71.5 | 78.5 | NA | NA | NA |
| Unleaded Regular | NA | NA | NA | 97.0 | 91.5 | 91.7 | 61.6 | 65.0 | 64.1 | 71.4 | 84.9 | 76.1 | 74.3 | 71.2 | 68.9 | 71.7 |
| Unleaded Midgrade | NA | NA | NA | NA | NA | NA | NA | NA | NA | 79.2 | 92.1 | 84.3 | 82.7 | 80.5 | 78.5 | 80.8 |
| Premium | NA | NA | NA | 105.7 | 101.5 | 102.3 | 73.7 | 78.4 | 78.8 | 86.7 | 98.5 | 90.7 | 91.4 | 88.9 | 86.5 | 89.0 |
| Kerosene | 90.2 | 112.3 | 108.9 | 96.1 | 103.6 | 103.0 | 79.0 | 77.0 | 73.8 | 70.9 | 92.3 | 83.8 | 78.8 | 75.4 | 66.0 | 58.9 |
| Jet Fuel, Kerosene-Type | 86.8 | 102.4 | 96.3 | 87.8 | 84.2 | 79.6 | 52.9 | 54.3 | 51.3 | 59.2 | 76.6 | 65.2 | 61.0 | 58.0 | 53.4 | 54.0 |
| No. 1 Distillate Fuel Oil | 83.4 | 103.9 | 102.3 | 96.2 | 92.7 | 88.0 | 62.0 | 60.4 | 56.4 | 66.1 | 81.9 | 74.0 | 66.6 | 66.6 | 64.0 | 62.0 |
| No. 2 Distillate Fuel Oil | 80.4 | 95.8 | 92.5 | 83.9 | 83.7 | 79.9 | 49.1 | 55.6 | 50.7 | 58.5 | 72.6 | 65.0 | 62.0 | 60.2 | 55.6 | 56.0 |
| No. 2 Fuel Oil | 78.8 | 91.4 | 90.5 | 91.6 | 91.6 | 84.9 | 56.0 | 58.1 | 54.4 | 58.7 | 73.4 | 66.5 | 62.7 | 60.2 | 57.2 | 55.8 |
| No. 2 Diesel Oil | 81.8 | 99.5 | 94.2 | 82.6 | 82.3 | 78.9 | 47.8 | 55.1 | 50.0 | 58.5 | 72.5 | 64.8 | 61.9 | 60.2 | 55.4 | 56.0 |
| No. 4 Distillate Fuel Oil [3] | 68.2 | 79.7 | 75.0 | 76.6 | 79.6 | 77.3 | 48.9 | 51.3 | 46.1 | 51.2 | 62.2 | 58.0 | 52.6 | 50.1 | 50.1 | 50.5 |
| Residual Fuel Oil | 60.7 | 75.6 | 67.6 | 65.1 | 68.7 | 61.0 | 34.3 | 42.3 | 33.4 | 38.5 | 44.4 | 34.0 | 33.6 | 33.7 | 35.2 | 39.1 |
| 1% or Less Sulfur Content | 67.5 | 82.9 | 74.7 | 69.5 | 72.0 | 64.4 | 37.2 | 44.7 | 37.2 | 43.6 | 50.5 | 40.2 | 38.9 | 39.7 | 40.1 | 43.4 |
| Greater than 1% Sulfur Content | 52.3 | 67.3 | 61.1 | 61.1 | 65.9 | 58.2 | 31.7 | 39.6 | 30.0 | 34.4 | 40.0 | 30.6 | 31.2 | 30.3 | R33.0 | 37.7 |
| Propane (Consumer Grade) | 48.2 | 56.5 | 59.2 | 70.9 | 73.7 | 71.7 | 74.5 | 70.1 | 71.4 | 61.5 | 74.5 | 73.0 | 64.3 | 67.3 | R53.0 | 49.2 |
| **Refiner Margins** [4] | | | | | | | | | | | | | | | | |
| Motor Gasoline | 27.3 | 22.5 | 21.4 | 19.2 | 15.1 | 19.8 | 18.4 | 16.3 | 22.8 | 22.6 | 25.7 | 24.5 | 23.8 | 23.5 | 22.8 | 21.6 |
| Jet Fuel, Kerosene-Type | 20.0 | 17.3 | 19.4 | 16.4 | 14.9 | 15.8 | 14.9 | 11.2 | 14.6 | 15.5 | 24.4 | 19.6 | 16.5 | 18.6 | 16.3 | 12.9 |
| No. 2 Distillate Fuel Oil | 13.4 | 13.5 | 15.5 | 12.2 | 13.1 | 13.8 | 12.4 | 10.4 | 12.4 | 13.8 | 16.6 | 16.4 | 14.6 | 16.8 | 15.1 | 12.0 |
| Residual Fuel Oil | -14.0 | -17.6 | -14.7 | -8.1 | -2.8 | -6.0 | -4.1 | -4.1 | -5.0 | -6.8 | -11.6 | -14.0 | -13.2 | -9.8 | R-5.4 | -4.8 |
| Composite [5] | 22.4 | 19.4 | 19.4 | 16.0 | 13.7 | 17.0 | 15.8 | 13.8 | 18.7 | 18.8 | 22.1 | 20.7 | 19.8 | 19.0 | R19.8 | 18.1 |

[1] Nominal dollars.

[2] Sales for resale, that is, wholesale sales, are those made to purchasers who are other than ultimate consumers. Sales to end users are those made directly to the ultimate consumer, including bulk customers, such as agriculture, industry, and utilities, as well as residential and commercial customers.

[3] Includes No. 4 fuel oil and No. 4 diesel fuel.

[4] On this table, refiner margin is the difference between the composite refiner acquisition price of crude oil and the price to resellers.

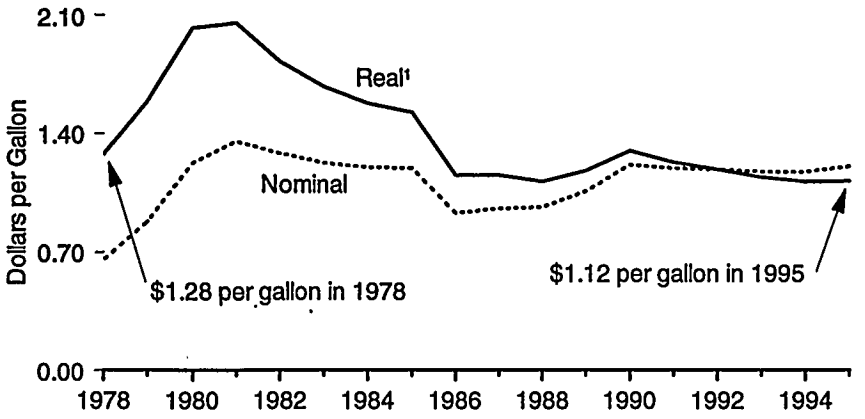
[5] Composite of aviation gasoline, kerosene-type jet fuel, kerosene, motor gasoline, distillate fuel nos. 1, 2, and 4, and residual fuel.

R=Revised data. P=Preliminary data. NA=Not available.

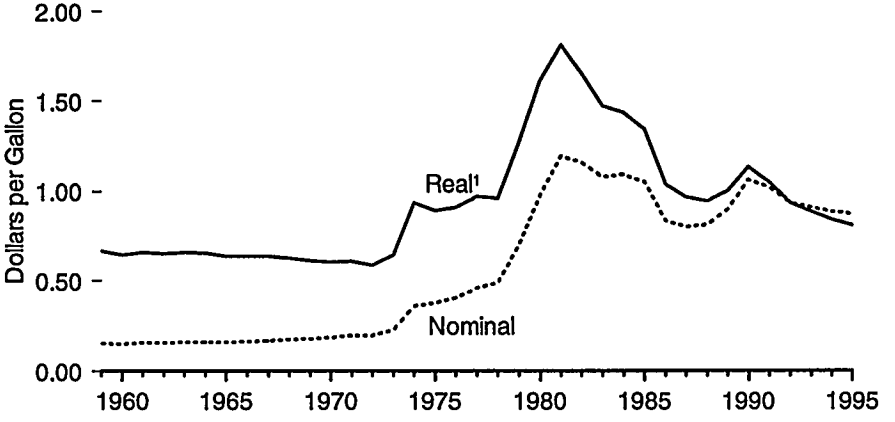
Sources: • 1978-1992—Energy Information Administration (EIA), Form EIA-460, "Petroleum Industry Monthly Report for Product Prices," the source for backcast estimates • 1983 forward—EIA, Form EIA-782A, "Monthly Petroleum Product Sales Report."

# Figure 5.21 Motor Gasoline and Residential Heating Oil Retail Prices

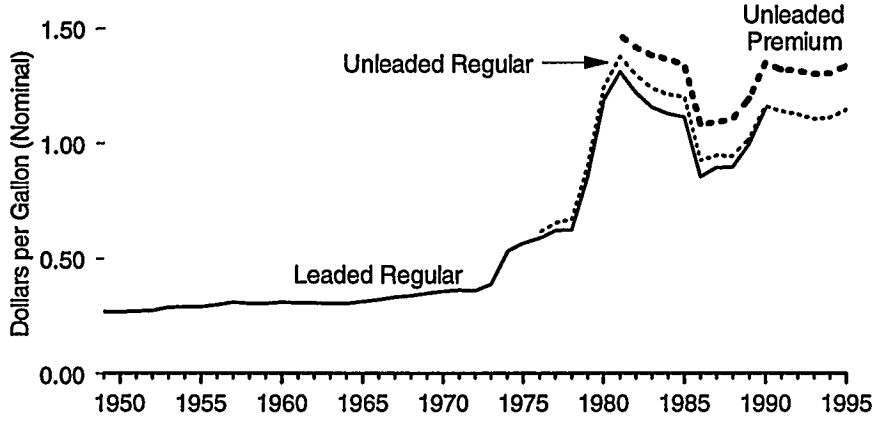
**Motor Gasoline, All Types, 1978-1995**



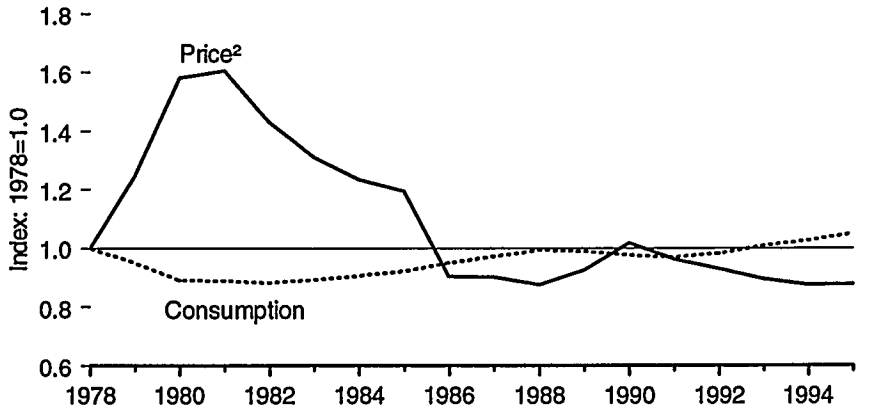

**Residential Heating Oil, 1959-1995**




**Motor Gasoline by Type, 1949-1995**




**Motor Gasoline¹ Price and Consumption, Indexed to 1978, 1978-1995**




¹ All types.

² In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Notes: • Residential heating oil prices from 1978 forward exclude all taxes. • Because vertical scales differ, graphs should not be compared.

Sources: Tables 5.11 and 5.21.

# Table 5.21 Motor Gasoline and Residential Heating Oil Retail Prices, 1949-1995

(Cents per Gallon)

| Year | Motor Gasoline (Including Taxes) | | | | | | | | Residential Heating Oil [2] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Leaded Regular [1] | | Unleaded Regular | | Unleaded Premium | | All Types | | | |
| | Nominal | Real [3] | Nominal | Real [3] | Nominal | Real [3] | Nominal | Real [3] | Nominal | Real [3] |
| 1949 | 26.8 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1950 | 26.8 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1951 | 27.2 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1952 | 27.4 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1953 | 28.7 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1954 | 29.0 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1955 | 29.1 | ([4]) | NA | NA | NA | NA | NA | NA | NA | NA |
| 1956 | 29.9 | ([4]) | NA | NA | NA | NA | NA | NA | 15.2 | ([4]) |
| 1957 | 31.0 | ([4]) | NA | NA | NA | NA | NA | NA | 16.0 | ([4]) |
| 1958 | 30.4 | ([4]) | NA | NA | NA | NA | NA | NA | 15.1 | ([4]) |
| 1959 | 30.5 | R133.2 | NA | NA | NA | NA | NA | NA | 15.3 | R66.8 |
| 1960 | 31.1 | R133.5 | NA | NA | NA | NA | NA | NA | 15.0 | R64.4 |
| 1961 | 30.8 | R130.5 | NA | NA | NA | NA | NA | NA | 15.6 | R66.1 |
| 1962 | 30.6 | R128.0 | NA | NA | NA | NA | NA | NA | 15.6 | R65.3 |
| 1963 | 30.4 | R125.6 | NA | NA | NA | NA | NA | NA | 16.0 | R66.1 |
| 1964 | 30.4 | R124.1 | NA | NA | NA | NA | NA | NA | 16.1 | R65.7 |
| 1965 | 31.2 | R124.8 | NA | NA | NA | NA | NA | NA | 16.0 | R64.0 |
| 1966 | 32.1 | R124.9 | NA | NA | NA | NA | NA | NA | 16.4 | R63.8 |
| 1967 | 33.2 | R125.3 | NA | NA | NA | NA | NA | NA | 16.9 | R63.8 |
| 1968 | 33.7 | R121.7 | NA | NA | NA | NA | NA | NA | 17.4 | R62.8 |
| 1969 | 34.8 | R120.0 | NA | NA | NA | NA | NA | NA | 17.8 | R61.4 |
| 1970 | 35.7 | R116.7 | NA | NA | NA | NA | NA | NA | 18.5 | R60.5 |
| 1971 | 36.4 | R113.0 | NA | NA | NA | NA | NA | NA | 19.6 | R60.9 |
| 1972 | 36.1 | R107.8 | NA | NA | NA | NA | NA | NA | 19.7 | R58.8 |
| 1973 | 38.8 | R109.6 | NA | NA | NA | NA | NA | NA | 22.8 | R64.4 |
| 1974 | 53.2 | R138.2 | NA | NA | NA | NA | NA | NA | 36.0 | R93.5 |
| 1975 | 56.7 | R134.4 | NA | NA | NA | NA | NA | NA | 37.7 | R89.3 |
| 1976 | 59.0 | R132.3 | 61.4 | R137.7 | NA | NA | NA | NA | 40.6 | R91.0 |
| 1977 | 62.2 | R131.2 | 65.6 | R138.4 | NA | NA | NA | NA | 46.0 | R97.0 |
| 1978 | 62.6 | R122.7 | 67.0 | R131.4 | NA | NA | 65.2 | R127.8 | 49.0 | R96.1 |
| 1979 | 85.7 | R155.0 | 90.3 | R163.3 | NA | NA | 88.2 | R159.5 | 70.4 | R127.3 |
| 1980 | 119.1 | R197.2 | 124.5 | R206.1 | NA | NA | 122.1 | R202.2 | 97.4 | R161.3 |
| 1981 | 131.1 | R198.9 | 137.8 | R209.1 | [5]147.0 | [5]223.1 | 135.3 | R205.3 | 119.4 | R181.2 |
| 1982 | 122.2 | R174.3 | 129.6 | R184.9 | 141.5 | R201.9 | 128.1 | R182.7 | 116.0 | R165.5 |
| 1983 | 115.7 | R158.3 | 124.1 | R169.8 | 138.3 | R189.2 | 122.5 | R167.6 | 107.8 | R147.5 |
| 1984 | 112.9 | R148.7 | 121.2 | R159.7 | 136.6 | R180.0 | 119.8 | R157.8 | 109.1 | R143.7 |
| 1985 | 111.5 | R142.2 | 120.2 | R153.3 | 134.0 | R170.9 | 119.6 | R152.6 | 105.3 | R134.3 |
| 1986 | 85.7 | R106.3 | 92.7 | R115.0 | 108.5 | R134.6 | 93.1 | R115.5 | 83.6 | R103.7 |
| 1987 | 89.7 | R107.9 | 94.8 | R114.1 | 109.3 | R131.5 | 95.7 | R115.2 | 80.3 | R96.6 |
| 1988 | 89.9 | R104.4 | 94.6 | R109.9 | 110.7 | R128.6 | 96.3 | R111.8 | 81.3 | R94.4 |
| 1989 | 99.8 | R111.3 | 102.1 | R113.8 | 119.7 | R133.4 | 106.0 | R118.2 | 90.0 | R100.3 |
| 1990 | 114.9 | R122.8 | 116.4 | R124.4 | 134.9 | R144.1 | 121.7 | R130.0 | 106.3 | R113.6 |
| 1991 | NA | NA | 114.0 | R117.2 | 132.1 | R135.8 | 119.6 | R122.9 | 101.9 | R104.7 |
| 1992 | NA | NA | 112.7 | R112.7 | 131.6 | R131.6 | 119.0 | R119.0 | 93.4 | R93.4 |
| 1993 | NA | NA | 110.8 | R108.0 | 130.2 | R126.9 | 117.3 | R114.3 | 91.1 | R88.8 |
| 1994 | NA | NA | 111.2 | R105.9 | 130.5 | R124.3 | 117.4 | R111.8 | P88.4 | P84.2 |
| 1995 | NA | NA | 114.7 | 106.7 | 133.6 | 124.3 | 120.5 | 112.1 | 87.2 | 81.1 |

[1] Average motor gasoline prices are calculated from a sample of service stations providing all types of service (i.e., full-, mini-, and self-serve). Geographic coverage - 1949-1973, 55 representative cities; 1974-1977, 56 urban areas; 1978 forward, 85 urban areas.

[2] Average residential heating oil (No. 2 fuel oil) prices are derived by dividing the sum of the estimated national value of retail sales for residential heating by the estimated volume of retail sales for residential heating. Data for 1978 forward exclude all taxes.

[3] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

[4] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal dollars to real (inflation-adjusted) values, were not available in time to use in this report.

[5] Based on September through December data only.

R=Revised data. P=Preliminary data. NA=Not available.

Sources: **Motor Gasoline:** • 1949-1973—*Platt's Oil Price Handbook and Oilmanac, 1974,* 51st Edition. • 1974 forward—Energy Information Administration (EIA), simple annual averages of monthly data from Bureau of Labor Statistics, *Consumer Prices: Energy.* **Residential Heating Oil:** • 1956-1974—Bureau of Labor Statistics, *Retail Prices and Indexes of Fuels and Utilities for Residential Usage,* monthly. • January 1975 through September 1977—Federal Energy Administration, Form FEA-P112-M-1, "No. 2 Heating Oil Supply/Price Monitoring Report." • October 1977 through December 1977—EIA, Form EIA-9, "No. 2 Heating Oil Supply/Price Monitoring Report." • 1978-1994—EIA, *Petroleum Marketing Annual 1994* (August 1995), Table 16. • 1995—EIA estimates.

## Petroleum Notes

1. Accurate calculation of the quantity of petroleum products supplied to the domestic market is complicated by the recycling of products at the refinery, the renaming of products involved in a transfer, and the receipt of products from outside the primary supply system. Beginning in 1981, a single adjustment (always a negative quantity) is made to total product supplied to correct this accounting problem. The calculation of this adjustment, called "reclassified," involves only unfinished oils and gasoline blending components. It is the sum of their net changes in primary stocks (net withdrawals is a plus quantity, net additions is a minus quantity) plus imports minus net input to refineries.

2. The methods for deriving Gross Input to Distillation Units (GIDU) in this report are as follows: 1949-1966, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns at refineries, and shipments of natural gasoline and plant condensate from natural gas processing plants to refineries. 1967-1973, GIDU is estimated by summing annual crude oil runs to stills, net unfinished oil reruns, and refinery input of natural gasoline and plant condensate. 1974-1980, GIDU is published annual data. 1981 forward, GIDU is the sum of reported monthly data.

3. Total petroleum products supplied is the sum of the product supplied for each petroleum product, crude oil, unfinished oils, and gasoline blending components. For each of these, except crude oil, product supplied is calculated by adding refinery production, natural gas plant liquids production, new supply of other liquids, imports, and stock withdrawals, and subtracting stock additions, refinery inputs, and exports. Crude oil product supplied is the sum of crude oil burned on leases and at pipeline pump stations as reported on Form EIA-813, "Monthly Crude Oil Report." Prior to 1983, crude oil burned on leases and at pipeline pump stations was reported as either distillate or residual fuel oil and was included as product supplied for these products. Petroleum products supplied is an approximation of petroleum consumption and is synonymous with the term "Petroleum Consumption" in Section 1. Sector data for petroleum products used in more than one sector are derived from surveys of sales to ultimate consumers by refiners, marketers, distributors, and dealers and from receipts at electric utilities.

4. Beginning in January 1981, several Energy Information Administration survey forms and calculation methodologies were changed to reflect new developments in refinery and blending plant practices and to improve data integrity. Those changes affect production and product supplied statistics for motor gasoline, distillate fuel oil, and residual fuel oil, and stocks of motor gasoline. On the basis of those changes, motor gasoline production during the last half of 1980 would have averaged 289,000 barrels per day higher than that which was published on the old basis. Distillate and residual fuel oil production and product supplied for all of 1980 would have averaged, respectively, 105,000 and 54,000 barrels per day higher than the numbers that were published.

5. The Crude Oil Domestic First Purchase Prices were derived as follows: 1949-1973, weighted average domestic first purchase values as reported by State agencies and calculated by the Bureau of Mines; 1974 and 1975, weighted averages of a sample survey of major first purchasers' purchases; 1976 forward, weighted averages of all first purchasers' purchases.

6. The Refiner Acquisition Cost of Crude Oil was estimated for 1968-1973. The cost of domestic crude oil was derived by adding estimated transportation costs to the reported average domestic first purchase value. The cost of imported crude oils was derived by adding an estimated ocean transport cost based on the published "Average Freight Rate Assessment" to the average "Free Alongside Ship" value published by the U.S. Bureau of the Census. The composite cost was derived by weighting domestic costs and imported costs on the basis of quantities produced and imported.

# 6. Natural Gas

## Prices

Through the early 1970's, natural gas prices were relatively stable. Thereafter, the natural gas market underwent a period of price fluctuations brought on by deregulation and industry restructuring. The annual average wellhead price, in real terms,[1] trended downward from a 1983 peak of $3.54 per thousand cubic feet to a 19-year low of $1.48 per thousand cubic feet in 1995 (6.8).* Lower costs of producing and transporting natural gas benefited consumers. In 1995, the average price, in real terms, paid by residential consumers was down 32 percent from the 1983 price (6.9). Corresponding prices paid by the commercial, industrial, and electric utilities sectors were down 39 percent, 57 percent, and 62 percent, respectively.

## Sectoral Patterns of Demand

Throughout the 1950's and 1960's, the market for natural gas expanded as low prices encouraged demand. Of the many factors affecting natural gas markets during those decades, Federal and State regulatory commissions were the most influential. Below-market rates for certain categories of natural gas, coupled with strong demand, ultimately resulted in regional shortages during the second half of the 1970's.

In 1972, total consumption of natural gas reached an all-time high of 22 trillion cubic feet (6.6). Thereafter, uncertainties about supply and rising energy prices began to erode demand. By the 1980's, lower demand resulted in a short-term surplus of deliverable gas and gas well shut-ins in many producing areas. In 1986, natural gas consumption totaled 16 trillion cubic feet, the lowest annual total since 1965.

Weakened demand spanned all end-use sectors but was most severe in the industrial and electric utility sectors, where, particularly during the early and mid-1980's, the option of fuel switching proved to be most viable. Lower consumption by the industrial sector accounted for over half of the 5.9-trillion-cubic-foot reduction from 1972 through 1986, and lower use at electric utilities accounted for close to one-fourth.

After the 1986 low point, natural gas consumption trended upward, reaching 22 trillion cubic feet in 1995 (6.6). All sectors except the residential consumed more natural gas in 1995 than they had in 1994. Industrial consumption of natural gas rose to 9.8 trillion cubic feet, a 4.4-percent increase, and electric utility consumption rose to 3.2 trillion cubic feet, up 6.7 percent. Consumption in the commercial sector rose to 3.1 trillion cubic feet, a 6.9-percent increase, in 1995. Transportation consumption of natural gas edged up to 0.7 trillion cubic feet. Residential consumption totaled 4.8 trillion cubic feet, slightly lower than consumption in 1994.

### Meeting Peak Demand

Seasonal, and even daily, fluctuations in natural gas demand are met by withdrawals from storage when demand is high and by injections into storage when demand is low compared with available gas flow in transmission lines. Net withdrawals from storage can provide more than half of some companies' peak winter deliveries. During the 1994-1995 heating season (October through March), net withdrawals from storage supplied 13 percent of total natural gas consumed.[2]

Natural gas in storage at the end of the year generally increased throughout the period of the 1970's, when local shortages resulted in curtailments to some consumers (6.7). Underground storage of working gas (that in excess of the base gas needed to maintain optimum reservoir pressure) equaled 7.1 percent of annual consumption in 1969 and 10 percent in 1995 (6.1 and 6.7). At the end of 1995, working gas in storage was 2.2 trillion cubic feet and base gas was 4.3 trillion cubic feet.

[2]Energy Information Administration, *Monthly Energy Review* March 1996, DOE/EIA-0035(96/03) (Washington, DC, March 1996), Tables 4.4 and 4.5.

[1]Real (inflation-adjusted) prices are expressed in chained (1992) dollars. Prices are nominal unless specifically noted as real.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Natural Gas Delivered for the Account of Others

During the 1980's, regulatory and legislative changes allowed consumers to purchase natural gas directly from producers and to arrange for pipeline and distribution companies to deliver it to them for a fee. Federal Energy Regulatory Commission Order 636 (implemented November 1, 1993) extended that trend toward a more efficient market by requiring interstate pipeline companies to unbundle (separate) their sales and transportation services. In 1994, natural gas delivered for the account of others to industrial, electric utility, and commercial customers reached 8.8 trillion cubic feet (6.5). Such deliveries accounted for 75 percent of total deliveries to industrial customers, 75 percent of total deliveries to electric utilities, and 21 percent of total deliveries to commercial customers.

## Natural Gas Production and Productivity

In 1995, gross withdrawals of natural gas from wells totaled 24 trillion cubic feet, up for the ninth consecutive year (6.2). Texas, Louisiana, and Oklahoma, the largest producers of natural gas, accounted for 59 percent of the U.S. total in 1995 (6.4). Most withdrawals came from onshore wells and State offshore wells, but 4.9 trillion cubic feet were Federal offshore withdrawals. The 24 trillion cubic feet of gross withdrawals in 1995 yielded 20 trillion cubic feet of marketed production (6.2).

The U.S. total of natural gas gross well withdrawals includes a small but rapidly growing amount of methane produced from coalbeds. In 1994, gross withdrawals of coalbed methane totaled about 851 billion cubic feet, an amount equal to 5 percent of U.S. total dry production.[3] However, the rate of increase in coalbed methane reserves slowed after 1992, when Federal tax incentives for new coalbed methane wells expired. In 1994, coalbed methane reserves declined for the first time since data collection began in 1988. U.S. total reserves in coalbed methane fields accounted for 6 percent of U.S. natural gas total reserves in 1994, about the same share as in 1993.

About 294 thousand gas wells were in operation during 1995 (6.4). Withdrawals from those wells accounted for almost three-fourths of all gross withdrawals, while oil wells supplied the remainder. After peaking at 435 thousand cubic feet per day in 1971 (6.4), average gas well productivity trended downward; from 1985 through 1993, productivity remained below 165 thousand cubic feet per day. In 1995, gas well productivity averaged 164 thousand cubic feet per day.

## Imports and Exports

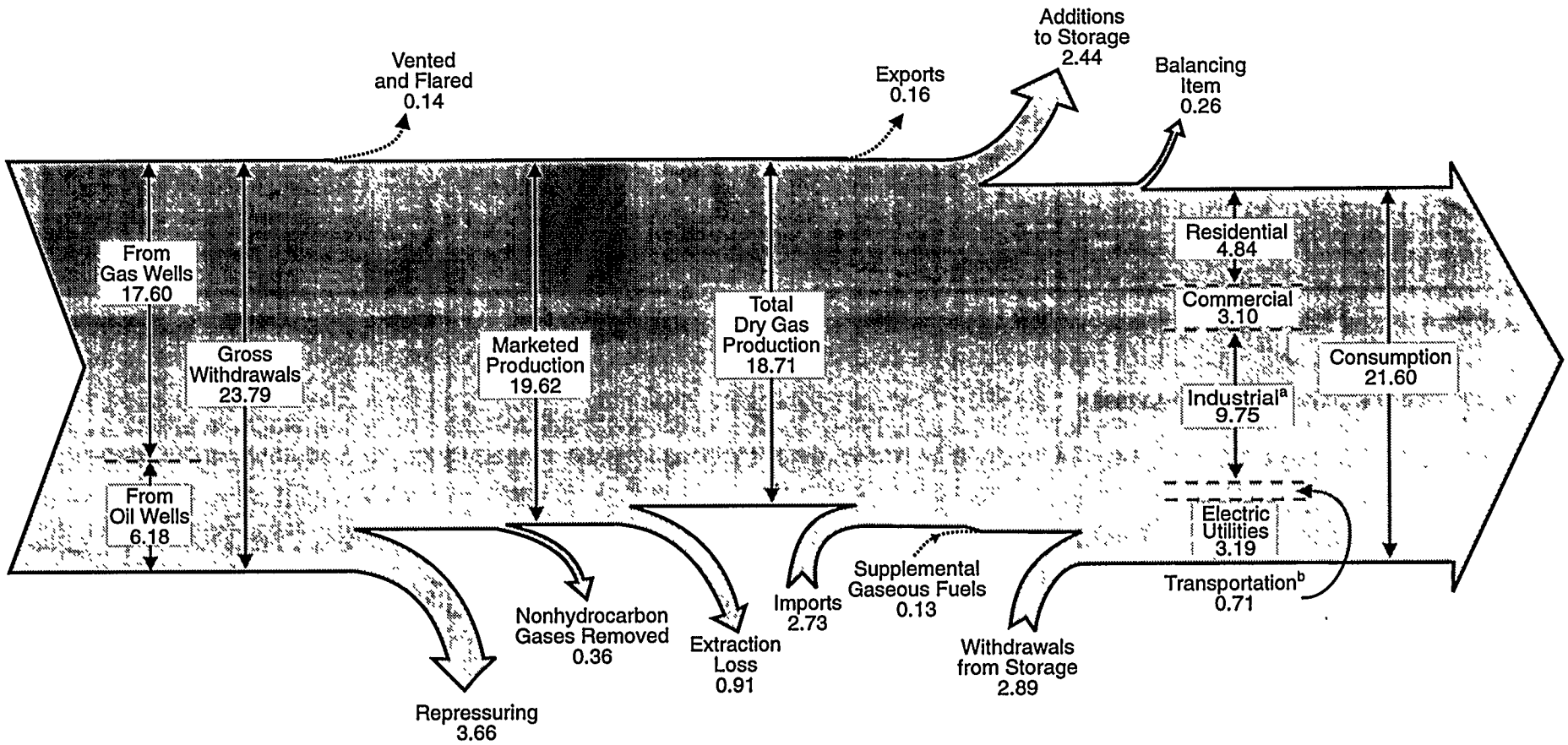
U.S. natural gas trade was limited to the border countries of Mexico and Canada until shipping natural gas in liquefied form emerged as an alternative to pipelines. In 1969, the first shipments of liquefied natural gas (LNG) from Alaska were sent to Japan, and U.S. imports from Algeria began the following year (6.3). In 1995, U.S. net imports of natural gas by all routes totaled 2.6 trillion cubic feet, up 4.5 percent from 1994 net imports and the equivalent of 12 percent of domestic consumption.

Historically, Canada has been the major supplier of U.S. natural gas imports, with Algeria and Mexico supplying smaller amounts. The remarkable growth in U.S. net imports of natural gas from the 1986 level of 689 billion cubic feet (a 17-year low at the time) to 2.6 trillion cubic feet in 1995 was due almost entirely to higher levels of imports from Canada. In 1995, Canada supplied net imports of 2.7 trillion cubic feet. Importing Canadian natural gas was facilitated by the completion of the Iroquois transportation system in January 1992.

From 1970 through 1990 and again in 1993 through 1995, Japan was the primary purchaser of U.S. natural gas. In 1995, Japan purchased 67 billion cubic feet of U.S. natural gas.

[3]Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1994 Annual Report*, DOE/EIA-0216(94) (Washington, DC, October 1995), p. 34.

## Diagram 3. Natural Gas Flow, 1995
(Trillion Cubic Feet)

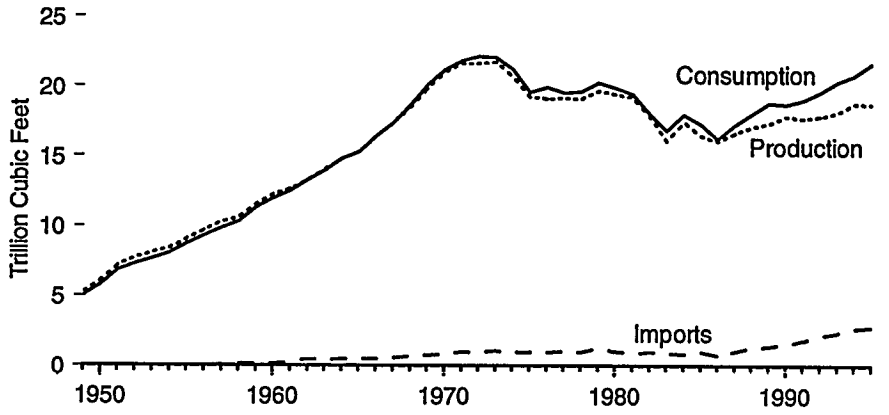



[a]Includes lease and plant fuel.
[b]Natural gas consumed in the operation of pipelines, primarily in compressors, and a small quantity used as vehicle fuel.

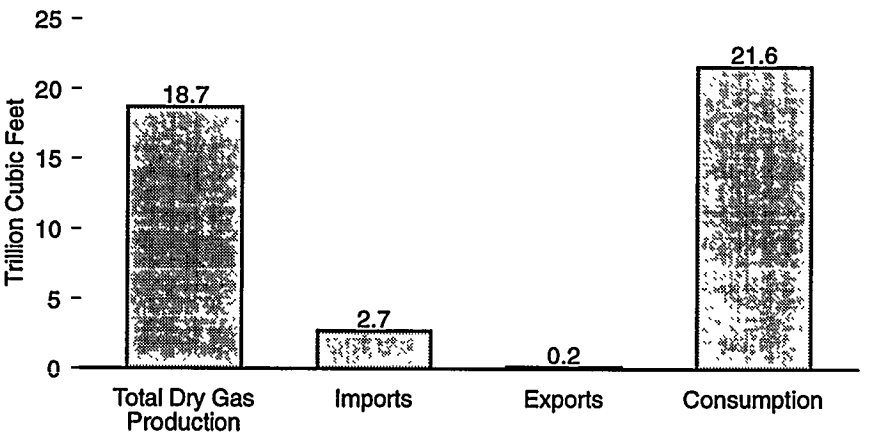
Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Sources: Tables 6.1, 6.2, and 6.6.

# Figure 6.1 Natural Gas Overview

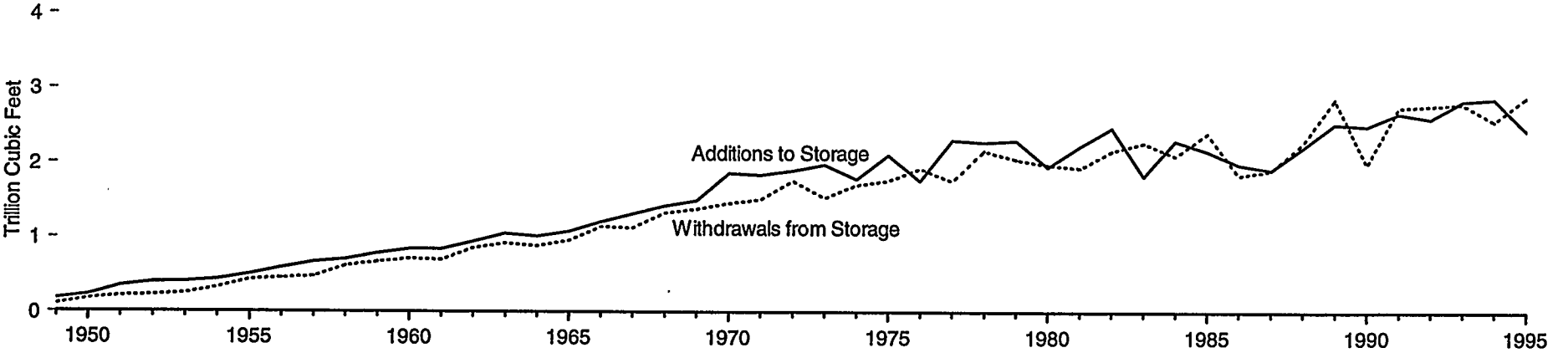
**Overview, 1949-1995**




**Overview, 1995**




**Storage Additions and Withdrawals[1], 1949-1995**




[1] Beginning with 1980, includes liquefied natural gas stored in above-ground tanks.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.1.

# Table 6.1 Natural Gas Overview, 1949-1995

(Trillion Cubic Feet)

| Year | Total Dry Gas Production | Supplemental Gaseous Fuels | Imports | Exports | Withdrawals from Storage [1] | Additions to Storage [1] | Balancing Item [2] | Consumption |
|---|---|---|---|---|---|---|---|---|
| 1949 | 5.20 | NA | 0.00 | 0.02 | 0.11 | 0.17 | -0.14 | 4.97 |
| 1950 | 6.02 | NA | 0.00 | 0.03 | 0.18 | 0.23 | -0.18 | 5.77 |
| 1951 | 7.16 | NA | 0.00 | 0.02 | 0.21 | 0.35 | -0.19 | 6.81 |
| 1952 | 7.69 | NA | 0.01 | 0.03 | 0.22 | 0.40 | -0.20 | 7.29 |
| 1953 | 8.06 | NA | 0.01 | 0.03 | 0.25 | 0.40 | -0.24 | 7.64 |
| 1954 | 8.39 | NA | 0.01 | 0.03 | 0.33 | 0.43 | -0.22 | 8.05 |
| 1955 | 9.03 | NA | 0.01 | 0.03 | 0.44 | 0.51 | -0.25 | 8.69 |
| 1956 | 9.66 | NA | 0.01 | 0.04 | 0.45 | 0.59 | -0.21 | 9.29 |
| 1957 | 10.25 | NA | 0.04 | 0.04 | 0.48 | 0.67 | -0.21 | 9.85 |
| 1958 | 10.57 | NA | 0.14 | 0.04 | 0.62 | 0.70 | -0.28 | 10.30 |
| 1959 | 11.55 | NA | 0.13 | 0.02 | 0.67 | 0.79 | -0.22 | 11.32 |
| 1960 | 12.23 | NA | 0.16 | 0.01 | 0.71 | 0.84 | -0.27 | 11.97 |
| 1961 | 12.66 | NA | 0.22 | 0.01 | 0.70 | 0.84 | -0.23 | 12.49 |
| 1962 | 13.25 | NA | 0.40 | 0.02 | 0.85 | 0.94 | -0.29 | 13.27 |
| 1963 | 14.08 | NA | 0.41 | 0.02 | 0.92 | 1.05 | -0.36 | 13.97 |
| 1964 | 14.82 | NA | 0.44 | 0.02 | 0.89 | 1.01 | -0.30 | 14.81 |
| 1965 | 15.29 | NA | 0.46 | 0.03 | 0.96 | 1.08 | -0.32 | 15.28 |
| 1966 | 16.47 | NA | 0.48 | 0.02 | 1.14 | 1.21 | -0.40 | 16.45 |
| 1967 | 17.39 | NA | 0.56 | 0.08 | 1.13 | 1.32 | -0.30 | 17.39 |
| 1968 | 18.49 | NA | 0.65 | 0.09 | 1.33 | 1.43 | -0.33 | 18.63 |
| 1969 | 19.83 | NA | 0.73 | 0.05 | 1.38 | 1.50 | -0.33 | 20.06 |
| 1970 | 21.01 | NA | 0.82 | 0.07 | 1.46 | 1.86 | -0.23 | 21.14 |
| 1971 | 21.61 | NA | 0.93 | 0.08 | 1.51 | 1.84 | -0.34 | 21.79 |
| 1972 | 21.62 | NA | 1.02 | 0.08 | 1.76 | 1.89 | -0.33 | 22.10 |
| 1973 | 21.73 | NA | 1.03 | 0.08 | 1.53 | 1.97 | -0.20 | 22.05 |
| 1974 | 20.71 | NA | 0.96 | 0.08 | 1.70 | 1.78 | -0.29 | 21.22 |
| 1975 | 19.24 | NA | 0.95 | 0.07 | 1.76 | 2.10 | -0.24 | 19.54 |
| 1976 | 19.10 | NA | 0.96 | 0.06 | 1.92 | 1.76 | -0.22 | 19.95 |
| 1977 | 19.16 | NA | 1.01 | 0.06 | 1.75 | 2.31 | -0.04 | 19.52 |
| 1978 | 19.12 | NA | 0.97 | 0.05 | 2.16 | 2.28 | -0.29 | 19.63 |
| 1979 | 19.66 | NA | 1.25 | 0.06 | 2.05 | 2.30 | -0.37 | 20.24 |
| 1980 | 19.40 | 0.15 | 0.98 | 0.05 | 1.97 | 1.95 | -0.64 | 19.88 |
| 1981 | 19.18 | 0.18 | 0.90 | 0.06 | 1.93 | 2.23 | -0.50 | 19.40 |
| 1982 | 17.82 | 0.14 | 0.93 | 0.05 | 2.16 | 2.47 | -0.54 | 18.00 |
| 1983 | 16.09 | 0.13 | 0.92 | 0.05 | 2.27 | 1.82 | -0.70 | 16.83 |
| 1984 | 17.47 | 0.11 | 0.84 | 0.05 | 2.10 | 2.30 | -0.22 | 17.95 |
| 1985 | 16.45 | 0.13 | 0.95 | 0.06 | 2.40 | 2.16 | -0.43 | 17.28 |
| 1986 | 16.06 | 0.11 | 0.75 | 0.06 | 1.84 | 1.98 | -0.49 | 16.22 |
| 1987 | 16.62 | 0.10 | 0.99 | 0.05 | 1.91 | 1.91 | -0.44 | 17.21 |
| 1988 | 17.10 | 0.10 | 1.29 | 0.07 | 2.27 | 2.21 | -0.45 | 18.03 |
| 1989 | 17.31 | 0.11 | 1.38 | 0.11 | 2.85 | 2.53 | -0.22 | 18.80 |
| 1990 | 17.81 | 0.12 | 1.53 | R0.09 | 1.99 | 2.50 | -0.15 | 18.72 |
| 1991 | 17.70 | 0.11 | 1.77 | 0.13 | 2.75 | 2.67 | -0.50 | 19.04 |
| 1992 | 17.84 | 0.12 | 2.14 | 0.22 | 2.77 | 2.60 | -0.51 | 19.54 |
| 1993 | R18.10 | 0.12 | 2.35 | 0.14 | 2.80 | 2.83 | R-0.11 | R20.28 |
| 1994 | R18.75 | R0.11 | R2.62 | R0.16 | R2.56 | R2.86 | R-0.26 | R20.76 |
| 1995P | 18.71 | 0.13 | 2.73 | 0.16 | 2.89 | 2.44 | -0.26 | 21.60 |

[1] Beginning with 1980, includes liquefied natural gas stored in above ground tanks.

[2] Quantities lost and imbalances in data due to differences among data sources. Excludes intransit shipments 1980 forward.

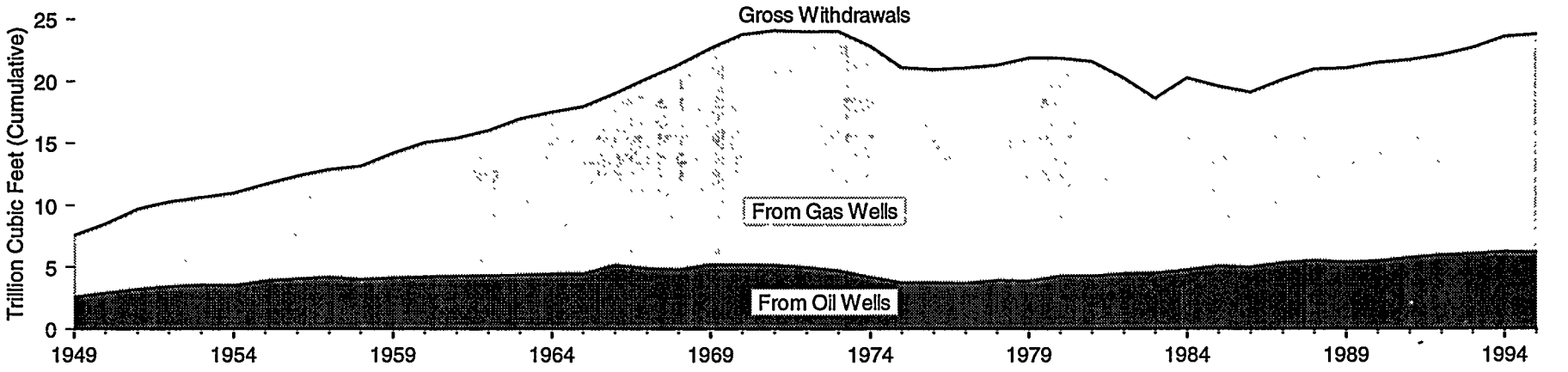
R=Revised data. P=Preliminary data. NA=Not available.

Notes: • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

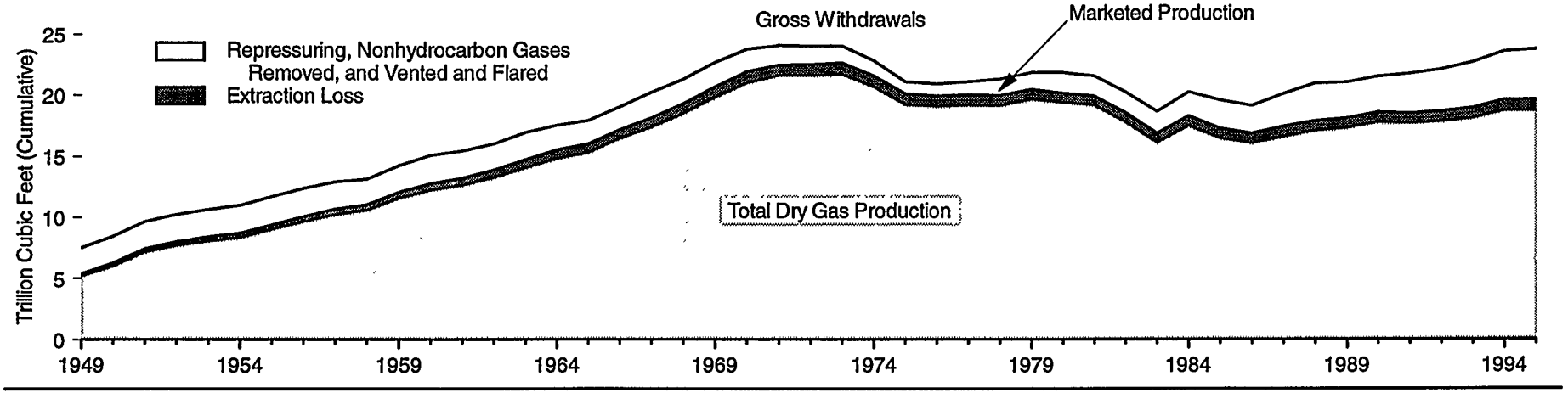
Sources: **1949-1988:** • Supplemental Gaseous Fuels—Energy Information Administration (EIA), *Natural Gas Annual 1992, Volume 2* (November 1993), Table 12. • All Other Data— EIA, *Natural Gas Annual 1994* (November 1995), Table 100. **1989 forward:** EIA, *Natural Gas Monthly* (March 1996), Table 2.

# Figure 6.2 Natural Gas Production, 1949-1995

**Gross Withdrawals by Well Type**




**Natural Gas Production by Phase**




Source: Table 6.2.

# Table 6.2 Natural Gas Production, 1949-1995

(Trillion Cubic Feet)

| Year | Gross Withdrawals | | | Repressuring | Nonhydrocarbon Gases Removed | Vented and Flared | Marketed Production | Extraction Loss [1] | Total Dry Gas Production |
|---|---|---|---|---|---|---|---|---|---|
| | From Gas Wells | From Oil Wells | Total | | | | | | |
| 1949 | 4.99 | 2.56 | 7.55 | 1.27 | NA | 0.85 | 5.42 | 0.22 | 5.20 |
| 1950 | 5.60 | 2.88 | 8.48 | 1.40 | NA | 0.80 | 6.28 | 0.26 | 6.02 |
| 1951 | 6.48 | 3.21 | 9.69 | 1.44 | NA | 0.79 | 7.46 | 0.29 | 7.16 |
| 1952 | 6.84 | 3.43 | 10.27 | 1.41 | NA | 0.85 | 8.01 | 0.32 | 7.69 |
| 1953 | 7.10 | 3.55 | 10.65 | 1.44 | NA | 0.81 | 8.40 | 0.34 | 8.06 |
| 1954 | 7.47 | 3.52 | 10.98 | 1.52 | NA | 0.72 | 8.74 | 0.35 | 8.39 |
| 1955 | 7.84 | 3.88 | 11.72 | 1.54 | NA | 0.77 | 9.41 | 0.38 | 9.03 |
| 1956 | 8.31 | 4.07 | 12.37 | 1.43 | NA | 0.86 | 10.08 | 0.42 | 9.66 |
| 1957 | 8.72 | 4.19 | 12.91 | 1.42 | NA | 0.81 | 10.68 | 0.43 | 10.25 |
| 1958 | 9.15 | 3.99 | 13.15 | 1.48 | NA | 0.63 | 11.03 | 0.46 | 10.57 |
| 1959 | 10.10 | 4.13 | 14.23 | 1.61 | NA | 0.57 | 12.05 | 0.50 | 11.55 |
| 1960 | 10.85 | 4.23 | 15.09 | 1.75 | NA | 0.56 | 12.77 | 0.54 | 12.23 |
| 1961 | 11.20 | 4.27 | 15.46 | 1.68 | NA | 0.52 | 13.25 | 0.59 | 12.66 |
| 1962 | 11.70 | 4.34 | 16.04 | 1.74 | NA | 0.43 | 13.88 | 0.62 | 13.25 |
| 1963 | 12.61 | 4.37 | 16.97 | 1.84 | NA | 0.38 | 14.75 | 0.67 | 14.08 |
| 1964 | 13.11 | 4.43 | 17.54 | 1.65 | NA | 0.34 | 15.55 | 0.72 | 14.82 |
| 1965 | 13.52 | 4.44 | 17.96 | 1.60 | NA | 0.32 | 16.04 | 0.75 | 15.29 |
| 1966 | 13.89 | 5.14 | 19.03 | 1.45 | NA | 0.38 | 17.21 | 0.74 | 16.47 |
| 1967 | 15.35 | 4.91 | 20.25 | 1.59 | NA | 0.49 | 18.17 | 0.78 | 17.39 |
| 1968 | 16.54 | 4.79 | 21.33 | 1.49 | NA | 0.52 | 19.32 | 0.83 | 18.49 |
| 1969 | 17.49 | 5.19 | 22.68 | 1.46 | NA | 0.53 | 20.70 | 0.87 | 19.83 |
| 1970 | 18.59 | 5.19 | 23.79 | 1.38 | NA | 0.49 | 21.92 | 0.91 | 21.01 |
| 1971 | 18.93 | 5.16 | 24.09 | 1.31 | NA | 0.28 | 22.49 | 0.88 | 21.61 |
| 1972 | 19.04 | 4.97 | 24.02 | 1.24 | NA | 0.25 | 22.53 | 0.91 | 21.62 |
| 1973 | 19.37 | 4.70 | 24.07 | 1.17 | NA | 0.25 | 22.65 | 0.92 | 21.73 |
| 1974 | 18.67 | 4.18 | 22.85 | 1.08 | NA | 0.17 | 21.60 | 0.89 | 20.71 |
| 1975 | 17.38 | 3.72 | 21.10 | 0.86 | NA | 0.13 | 20.11 | 0.87 | 19.24 |
| 1976 | 17.19 | 3.75 | 20.94 | 0.86 | NA | 0.13 | 19.95 | 0.85 | 19.10 |
| 1977 | 17.42 | 3.68 | 21.10 | 0.93 | NA | 0.14 | 20.03 | 0.86 | 19.16 |
| 1978 | 17.39 | 3.91 | 21.31 | 1.18 | NA | 0.15 | 19.97 | 0.85 | 19.12 |
| 1979 | 18.03 | 3.85 | 21.88 | 1.25 | NA | 0.17 | 20.47 | 0.81 | 19.66 |
| 1980 | 17.57 | 4.30 | 21.87 | 1.37 | 0.20 | 0.13 | 20.18 | 0.78 | 19.40 |
| 1981 | 17.34 | 4.25 | 21.59 | 1.31 | 0.22 | 0.10 | 19.96 | 0.77 | 19.18 |
| 1982 | 15.81 | 4.46 | 20.27 | 1.39 | 0.21 | 0.09 | 18.58 | 0.76 | 17.82 |
| 1983 | 14.15 | 4.51 | 18.66 | 1.46 | 0.22 | 0.09 | 16.88 | 0.79 | 16.09 |
| 1984 | 15.51 | 4.75 | 20.27 | 1.63 | 0.22 | 0.11 | 18.30 | 0.84 | 17.47 |
| 1985 | 14.54 | 5.07 | 19.61 | 1.92 | 0.33 | 0.09 | 17.27 | 0.82 | 16.45 |
| 1986 | 14.15 | 4.98 | 19.13 | 1.84 | 0.34 | 0.10 | 16.86 | 0.80 | 16.06 |
| 1987 | 14.81 | 5.33 | 20.14 | 2.21 | 0.38 | 0.12 | 17.43 | 0.81 | 16.62 |
| 1988 | 15.47 | 5.53 | 21.00 | 2.48 | 0.46 | 0.14 | 17.92 | 0.82 | 17.10 |
| 1989 | 15.71 | 5.37 | 21.07 | 2.48 | 0.36 | 0.14 | 18.10 | 0.78 | 17.31 |
| 1990 | 16.05 | 5.47 | 21.52 | 2.49 | 0.29 | 0.15 | 18.59 | 0.78 | 17.81 |
| 1991 | 16.02 | 5.73 | 21.75 | 2.77 | 0.28 | 0.17 | 18.53 | 0.83 | 17.70 |
| 1992 | 16.16 | 5.97 | 22.13 | 2.97 | 0.28 | 0.17 | 18.71 | 0.87 | 17.84 |
| 1993 | R16.69 | 6.03 | 22.73 | R3.10 | 0.41 | R0.23 | R18.98 | 0.89 | R18.10 |
| 1994 | R17.38 | R6.23 | R23.61 | R3.33 | R0.41 | R0.23 | R19.64 | R0.89 | R18.75 |
| 1995P | 17.60 | 6.18 | 23.79 | 3.66 | 0.36 | 0.14 | 19.62 | 0.91 | 18.71 |

[1] Volume reduction resulting from the removal of natural gas plant liquids. Natural gas plant liquids are transferred to petroleum supply.

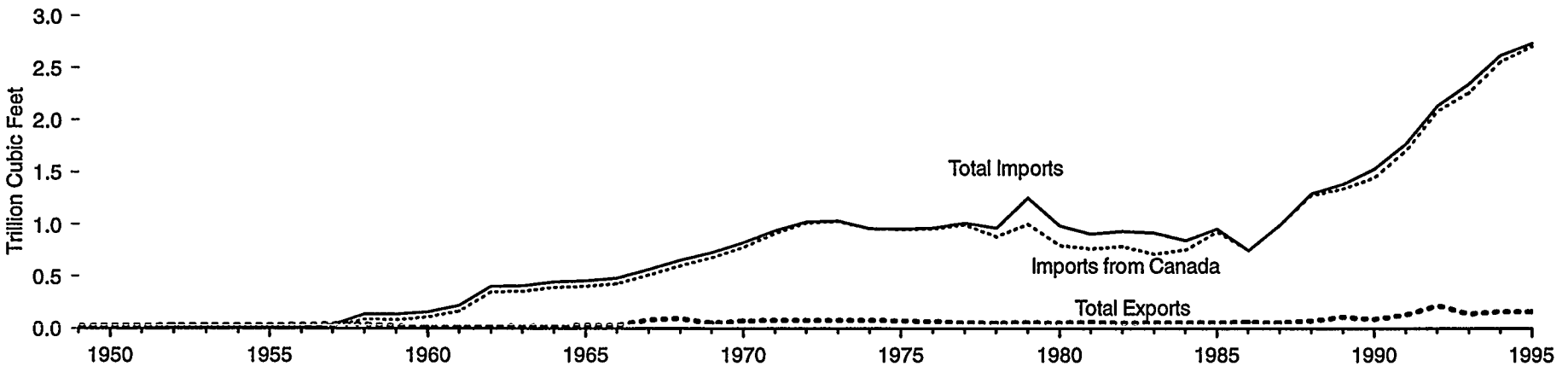
R=Revised data. P=Preliminary data. NA=Not available.

Notes: • Beginning with 1965 data, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.

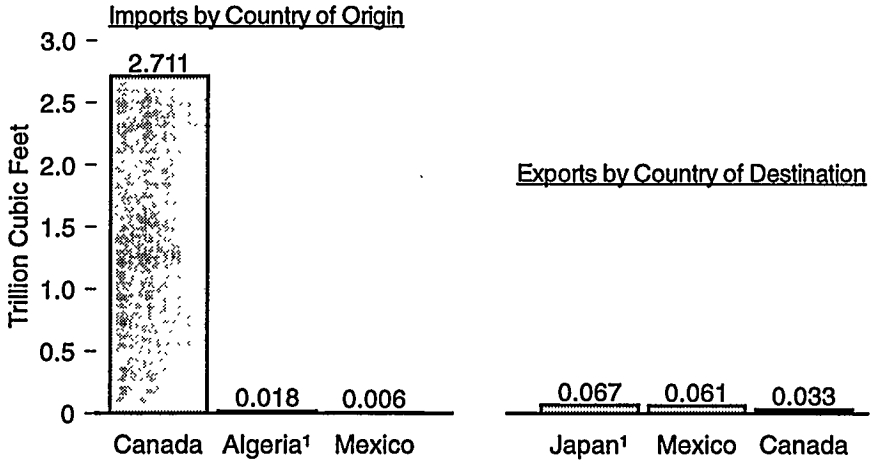
Sources: **From Gas Wells and From Oil Wells:** • 1949-1966—Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. • 1967-1988—Energy Information Administration (EIA), *Natural Gas Annual 1992, Volume 2* (November 1993), Table 5. • 1989-1994—EIA, *Natural Gas Annual 1994* (October 1995), Table 3. • 1995—EIA, estimated data. **All Other Data:** • 1949-1989—EIA, *Natural Gas Annual 1994* (October 1995), Table 99. • 1990 forward—EIA, *Natural Gas Monthly* (March 1996), Table 1.

# Figure 6.3 Natural Gas Imports, Exports, and Net Imports

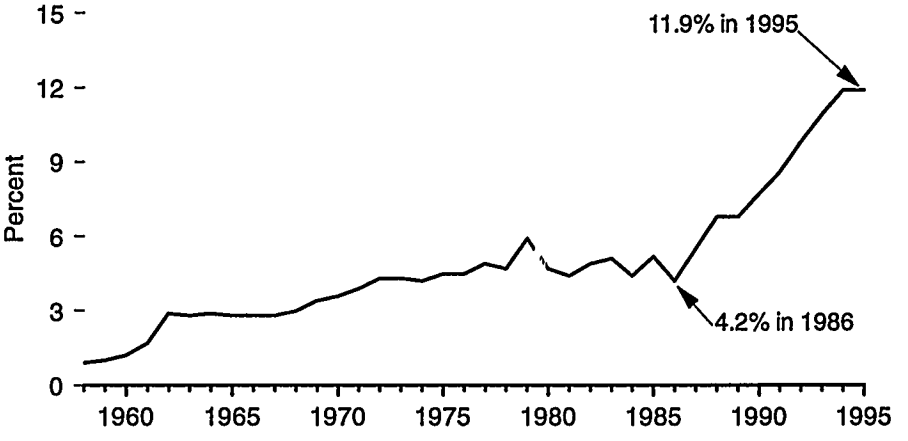
**Trade Overview, 1949-1995**




**Trade, 1995**




**Net Imports as Share of Consumption, 1958-1995**




[1] Imports from Algeria and exports to Japan are liquefied petroleum gases.

Source: Table 6.3.

# Table 6.3 Natural Gas Imports, Exports, and Net Imports, 1949-1995

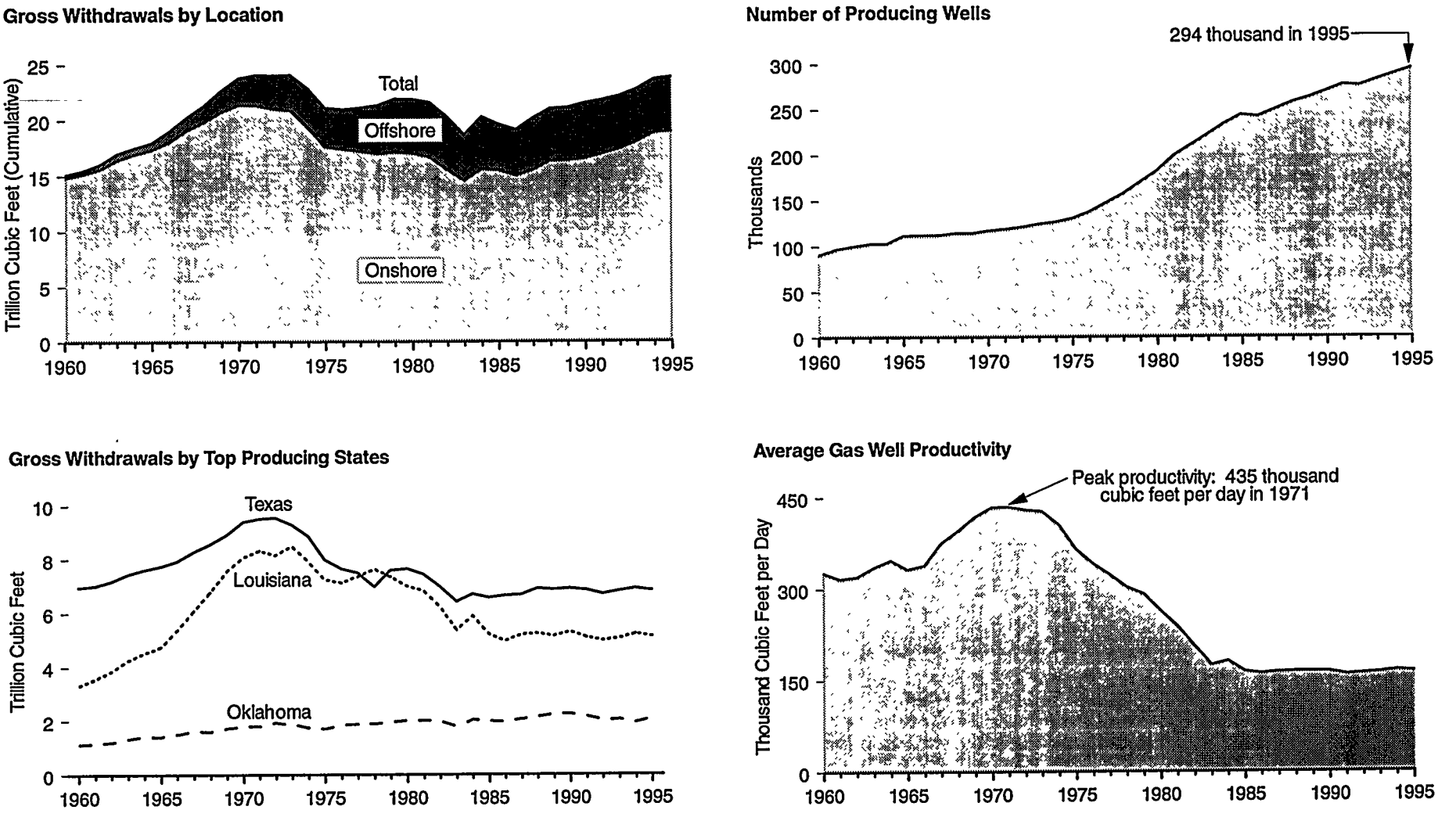
(Billion Cubic Feet, Except as Noted)

| Year | Imports by Country of Origin | | | | | Exports by Country of Destination | | | | Net Imports [1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Canada | Mexico | Algeria [2] | Indonesia | Total | Canada | Mexico | Japan [2] | Total | Total | Percent of U.S. Consumption |
| 1949 | 0 | 0 | 0 | 0 | 0 | (s) | 20 | 0 | 20 | -20 | ([3]) |
| 1950 | 0 | 0 | 0 | 0 | 0 | 3 | 23 | 0 | 26 | -26 | ([3]) |
| 1951 | 0 | 0 | 0 | 0 | 0 | 4 | 21 | 0 | 24 | -24 | ([3]) |
| 1952 | 8 | (s) | 0 | 0 | 8 | 6 | 22 | 0 | 27 | -20 | ([3]) |
| 1953 | 9 | 0 | 0 | 0 | 9 | 6 | 22 | 0 | 28 | -19 | ([3]) |
| 1954 | 7 | 0 | 0 | 0 | 7 | 6 | 23 | 0 | 29 | -22 | ([3]) |
| 1955 | 11 | (s) | 0 | 0 | 11 | 11 | 20 | 0 | 31 | -20 | ([3]) |
| 1956 | 10 | (s) | 0 | 0 | 10 | 17 | 19 | 0 | 36 | -26 | ([3]) |
| 1957 | 21 | 17 | 0 | 0 | 38 | 31 | 11 | 0 | 42 | -4 | ([3]) |
| 1958 | 90 | 46 | 0 | 0 | 136 | 32 | 7 | 0 | 39 | 97 | 0.9 |
| 1959 | 83 | 51 | 0 | 0 | 134 | 12 | 7 | 0 | 18 | 116 | 1.0 |
| 1960 | 109 | 47 | 0 | 0 | 156 | 6 | 6 | 0 | 11 | 144 | 1.2 |
| 1961 | 167 | 52 | 0 | 0 | 219 | 6 | 5 | 0 | 11 | 208 | 1.7 |
| 1962 | 350 | 51 | 0 | 0 | 402 | 6 | 10 | 0 | 16 | 386 | 2.9 |
| 1963 | 356 | 50 | 0 | 0 | 406 | 7 | 10 | 0 | 17 | 389 | 2.8 |
| 1964 | 391 | 53 | 0 | 0 | 443 | 10 | 10 | 0 | 20 | 424 | 2.9 |
| 1965 | 405 | 52 | 0 | 0 | 456 | 18 | 8 | 0 | 26 | 430 | 2.8 |
| 1966 | 430 | 50 | 0 | 0 | 480 | 20 | 4 | 0 | 25 | 455 | 2.8 |
| 1967 | 513 | 51 | 0 | 0 | 564 | 70 | 11 | 0 | 82 | 483 | 2.8 |
| 1968 | 604 | 47 | 0 | 0 | 652 | 82 | 12 | 0 | 94 | 558 | 3.0 |
| 1969 | 680 | 47 | 0 | 0 | 727 | 35 | 13 | 3 | 51 | 676 | 3.4 |
| 1970 | 779 | 41 | 1 | 0 | 821 | 11 | 15 | 44 | 70 | 751 | 3.6 |
| 1971 | 912 | 21 | 1 | 0 | 935 | 14 | 16 | 50 | 80 | 854 | 3.9 |
| 1972 | 1,009 | 8 | 2 | 0 | 1,019 | 16 | 15 | 48 | 78 | 941 | 4.3 |
| 1973 | 1,028 | 2 | 3 | 0 | 1,033 | 15 | 14 | 48 | 77 | 956 | 4.3 |
| 1974 | 959 | (s) | 0 | 0 | 959 | 13 | 13 | 50 | 77 | 882 | 4.2 |
| 1975 | 948 | 0 | 5 | 0 | 953 | 10 | 9 | 53 | 73 | 880 | 4.5 |
| 1976 | 954 | 0 | 10 | 0 | 964 | 8 | 7 | 50 | 65 | 899 | 4.5 |
| 1977 | 997 | 2 | 11 | 0 | 1,011 | (s) | 4 | 52 | 56 | 955 | 4.9 |
| 1978 | 881 | 0 | 84 | 0 | 966 | (s) | 4 | 48 | 53 | 913 | 4.7 |
| 1979 | 1,001 | 0 | 253 | 0 | 1,253 | (s) | 4 | 51 | 56 | 1,198 | 5.9 |
| 1980 | 797 | 102 | 86 | 0 | 985 | (s) | 4 | 45 | 49 | 936 | 4.7 |
| 1981 | 762 | 105 | 37 | 0 | 904 | (s) | 3 | 56 | 59 | 845 | 4.4 |
| 1982 | 783 | 95 | 55 | 0 | 933 | (s) | 2 | 50 | 52 | 882 | 4.9 |
| 1983 | 712 | 75 | 131 | 0 | 918 | (s) | 2 | 53 | 55 | 864 | 5.1 |
| 1984 | 755 | 52 | 36 | 0 | 843 | (s) | 2 | 53 | 55 | 788 | 4.4 |
| 1985 | 926 | 0 | 24 | 0 | 950 | (s) | 2 | 53 | 55 | 894 | 5.2 |
| 1986 | 749 | 0 | 0 | 2 | 750 | 9 | 2 | 50 | 61 | 689 | 4.2 |
| 1987 | 993 | 0 | 0 | 0 | 993 | 3 | 2 | 49 | 54 | 939 | 5.5 |
| 1988 | 1,276 | 0 | 17 | 0 | 1,294 | 20 | 2 | 52 | 74 | 1,220 | 6.8 |
| 1989 | 1,339 | 0 | 42 | 0 | 1,382 | 38 | 17 | 51 | 107 | 1,275 | 6.8 |
| 1990 | 1,448 | 0 | 84 | 0 | 1,532 | 17 | 16 | 53 | 86 | R1,446 | 7.7 |
| 1991 | 1,710 | 0 | 64 | 0 | 1,773 | 15 | 60 | 54 | 129 | 1,644 | 8.6 |
| 1992 | 2,094 | 0 | 43 | 0 | 2,138 | 68 | 96 | 53 | 216 | 1,921 | 9.8 |
| 1993 | 2,267 | 2 | 82 | 0 | 2,350 | 45 | 40 | 56 | 140 | 2,210 | 10.9 |
| 1994 | R2,566 | 7 | 51 | 0 | R2,624 | R53 | R47 | 63 | R162 | R2,462 | R11.9 |
| 1995P | 2,711 | 6 | 18 | 0 | 2,735 | 33 | 61 | 67 | 161 | 2,574 | 11.9 |

[1] Net imports = imports minus exports.
[2] Imports from Algeria and exports to Japan are liquefied natural gas.
[3] Not meaningful because there were net exports during this year.
R=Revised data. P=Preliminary data. (s)=Less than 0.5 billion cubic feet.
Note: Totals may not equal sum of components due to independent rounding.

Sources: **Total Imports and Total Exports:** • 1949-1994—Energy Information Administration (EIA), *Natural Gas Annual 1994* (November 1995), Table 100. • 1995—EIA estimates. **All Other Data:** • 1949-1954—Energy Information Administration (EIA), Office of Oil and Gas, Reserves and Natural Gas Division, unpublished data. • 1955-1994—EIA, *Natural Gas Monthly* (March 1996), Tables 5, 6, and unpublished revisions. • 1995—EIA estimates.

# Figure 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1995




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.4.

# Table 6.4 Natural Gas Gross Withdrawals by State and Location and Gas Well Productivity, 1960-1995

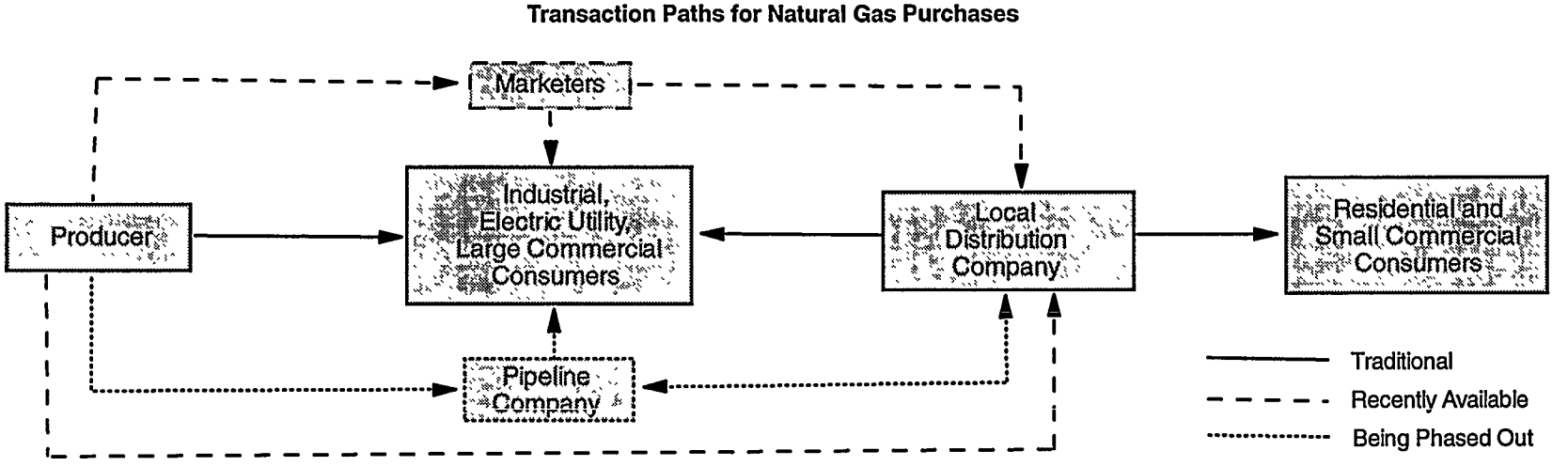
(Trillion Cubic Feet, Except as Noted)

| Year | State | | | | Location | | Gross Withdrawals from Oil and Gas Wells | Gas Well [1] Productivity | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Texas | Louisiana | Oklahoma | Other | Onshore [2] | Offshore [3] | | Gross Withdrawals from Gas Wells | Thousands of Producing Wells [4] | Average Productivity (thousand cubic feet per day) |
| 1960 | 6.96 | 3.31 | 1.13 | 3.68 | 14.81 | 0.27 | 15.09 | 10.85 | 91 | 326.7 |
| 1961 | 7.02 | 3.57 | 1.16 | 3.71 | 15.14 | 0.32 | 15.46 | 11.20 | 97 | 316.8 |
| 1962 | 7.20 | 3.85 | 1.22 | 3.76 | 15.59 | 0.45 | 16.04 | 11.70 | 100 | 319.8 |
| 1963 | 7.45 | 4.25 | 1.35 | 3.92 | 16.41 | 0.56 | 16.97 | 12.61 | 103 | 335.4 |
| 1964 | 7.62 | 4.52 | 1.42 | 3.98 | 16.91 | 0.62 | 17.54 | 13.11 | 103 | 347.4 |
| 1965 | 7.74 | 4.76 | 1.41 | 4.04 | 17.32 | 0.65 | 17.96 | 13.52 | 112 | 331.8 |
| 1966 | 7.93 | 5.37 | 1.50 | 4.23 | 18.03 | 1.01 | 19.03 | 13.89 | 112 | 338.4 |
| 1967 | 8.29 | 6.09 | 1.62 | 4.25 | 19.06 | 1.19 | 20.25 | 15.35 | 112 | 374.3 |
| 1968 | 8.57 | 6.78 | 1.61 | 4.37 | 19.80 | 1.52 | 21.33 | 16.54 | 114 | 395.1 |
| 1969 | 8.91 | 7.56 | 1.74 | 4.46 | 20.72 | 1.95 | 22.68 | 17.49 | 114 | 418.6 |
| 1970 | 9.40 | 8.08 | 1.81 | 4.50 | 21.37 | 2.42 | 23.79 | 18.59 | 117 | 433.6 |
| 1971 | 9.52 | 8.32 | 1.81 | 4.44 | 21.31 | 2.78 | 24.09 | 18.93 | 119 | 434.8 |
| 1972 | 9.55 | 8.16 | 1.93 | 4.38 | 20.98 | 3.04 | 24.02 | 19.04 | 121 | 429.4 |
| 1973 | 9.29 | 8.49 | 1.89 | 4.40 | 20.86 | 3.21 | 24.07 | 19.37 | 124 | 427.4 |
| 1974 | 8.86 | 7.92 | 1.76 | 4.31 | 19.34 | 3.51 | 22.85 | 18.67 | 126 | 404.9 |
| 1975 | 7.99 | 7.24 | 1.72 | 4.15 | 17.55 | 3.55 | 21.10 | 17.38 | 130 | 365.3 |
| 1976 | 7.67 | 7.14 | 1.84 | 4.29 | 17.35 | 3.60 | 20.94 | 17.19 | 138 | 341.5 |
| 1977 | 7.50 | 7.35 | 1.89 | 4.36 | 17.16 | 3.93 | 21.10 | 17.42 | 148 | 323.1 |
| 1978 | 6.99 | 7.64 | 1.89 | 4.79 | 16.95 | 4.36 | 21.31 | 17.39 | 157 | 302.7 |
| 1979 | 7.59 | 7.36 | 1.96 | 4.97 | 17.06 | 4.82 | 21.88 | 18.03 | 170 | 290.8 |
| 1980 | 7.66 | 7.01 | 2.02 | 5.19 | 16.97 | 4.90 | 21.87 | 17.57 | 182 | 263.8 |
| 1981 | 7.45 | 6.83 | 2.02 | 5.29 | 16.60 | 4.99 | 21.59 | 17.34 | 199 | 238.9 |
| 1982 | 6.98 | 6.22 | 1.99 | 5.09 | 15.50 | 4.77 | 20.27 | 15.81 | 211 | 205.5 |
| 1983 | 6.43 | 5.38 | 1.78 | 5.07 | 14.48 | 4.18 | 18.66 | 14.15 | 222 | 174.7 |
| 1984 | 6.71 | 5.89 | 2.05 | 5.62 | 15.56 | 4.71 | 20.27 | 15.51 | 234 | 181.2 |
| 1985 | 6.58 | 5.22 | 1.99 | 5.82 | 15.42 | 4.19 | 19.61 | 14.54 | 243 | 163.6 |
| 1986 | 6.66 | 4.96 | 1.97 | 5.54 | 14.95 | 4.19 | 19.13 | 14.15 | 242 | 160.6 |
| 1987 | 6.69 | 5.20 | 2.07 | 6.17 | 15.47 | 4.67 | 20.14 | 14.81 | 249 | 162.8 |
| 1988 | 6.92 | 5.25 | 2.17 | 6.67 | 16.25 | 4.75 | 21.00 | 15.47 | 257 | 164.3 |
| 1989 | 6.88 | 5.14 | 2.24 | 6.81 | 16.30 | 4.77 | 21.07 | 15.71 | 262 | 164.0 |
| 1990 | 6.91 | 5.30 | 2.26 | 7.05 | 16.48 | 5.05 | 21.52 | 16.05 | R269 | R163.4 |
| 1991 | 6.85 | 5.10 | 2.15 | 7.65 | 16.90 | 4.85 | 21.75 | 16.02 | R276 | R158.8 |
| 1992 | 6.71 | 4.98 | 2.02 | 8.43 | 17.36 | 4.77 | 22.13 | 16.16 | R275 | R160.8 |
| 1993 | 6.82 | 5.05 | 2.05 | R8.81 | 17.96 | 4.77 | 22.73 | R16.69 | R282 | R162.1 |
| 1994 | R6.91 | R5.23 | R1.93 | R9.54 | R18.77 | R4.84 | R23.61 | R17.38 | 288 | R165.4 |
| 1995P | 6.84 | 5.13 | 2.08 | 9.74 | 18.93 | 4.86 | 23.79 | 17.60 | 294 | 163.9 |

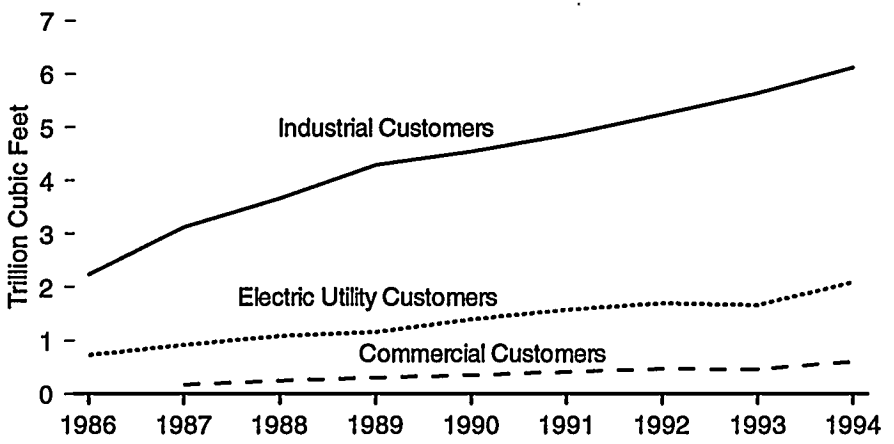
[1] See Glossary.
[2] Includes State offshore gross withdrawals.
[3] Excludes State offshore gross withdrawals; includes Federal offshore (Outer Continental Shelf) gross withdrawals.
[4] As of December 31.
R=Revised data. P=Preliminary data.

Sources: **Offshore** (Outer Continental Shelf): • 1960-1981—U.S. Geological Survey. • 1982-1985—The United States Minerals Management Service, *Mineral Revenues - The 1989 Report on Receipts from Federal and Indian Leases,* and predecessor annual reports. • 1986—Energy Information Administration (EIA), *Natural Gas Annual 1990, Volume 1* (December 1991), Table 4. • 1987—EIA, *Natural Gas Annual 1991* (October 1992), Table 4. • 1988—EIA, *Natural Gas Annual 1992, Volume 1* (November 1993), Table 4. • 1989-1994—EIA, *Natural Gas Annual 1994* (November 1995), Table 4. • 1995—The United States Minerals Management Service. **Gross Withdrawals:** • 1960-1966—Bureau of Mines, *Minerals Yearbook,* "Natural Gas" chapter. • 1967-1988—EIA, *Natural Gas Annual 1992, Volume 2* (November 1993), Table 5. • 1989-1994—EIA, *Natural Gas Annual 1994* (November 1995), Table 3. • 1995—EIA, estimated data. **All Other Data:** • 1960-1966—Bureau of Mines, *Natural Gas Production and Consumption.* • 1967-1992—EIA, *Natural Gas Annual 1992, Volume 2* (November 1993), Tables 5 and 6. • 1993-1994—EIA, *Natural Gas Annual 1994* (November 1995), Tables 3 and 5. • 1995—EIA, *Natural Gas Monthly* (March 1995), Table 1, and Gulf Publishing Company, *World Oil,* February 1996.

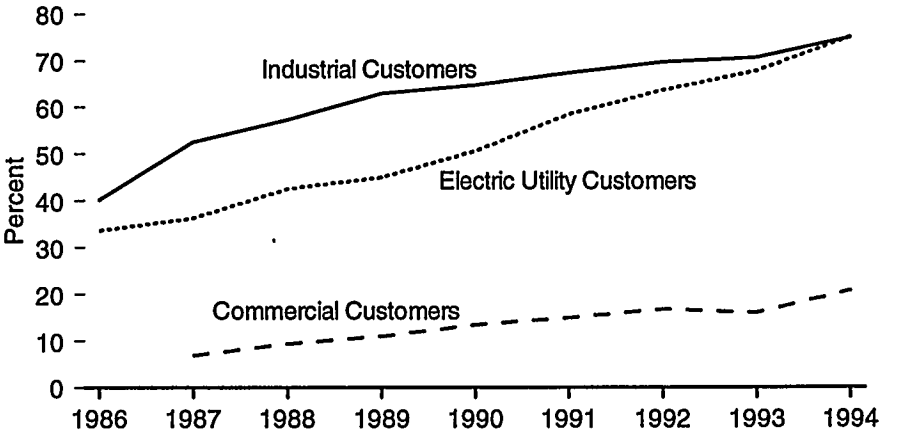
## Figure 6.5 Natural Gas Delivered for the Account of Others




**Natural Gas Delivered for the Account of Others, 1986-1994**




**Account of Others Share of Total Deliveries to Sector, 1986-1994**




Source: Table 6.5.

# Table 6.5 Natural Gas Delivered for the Account of Others, 1986-1994

| Year | Commercial Customers | | | Industrial Customers | | | Electric Utilities [1] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Delivered for the Account of Others | Total Deliveries [2] | Account of Others Share of Total | Delivered for the Account of Others | Total Deliveries | Account of Others Share of Total | Delivered for the Account of Others | Total Deliveries | Account of Others Share of Total [1] |
| | Billion Cubic Feet | | Percent | Billion Cubic Feet | | Percent | Billion Cubic Feet | | Percent |
| 1986 | NA | 2,318 | NA | 2,240 | 5,579 | 40 | 721 | 2,602 | 34 |
| 1987 | 167 | 2,430 | 7 | 3,129 | 5,953 | 53 | 914 | 2,844 | 36 |
| 1988 | 247 | 2,670 | 9 | 3,663 | 6,383 | 57 | 1,076 | 2,636 | 43 |
| 1989 | 296 | 2,718 | 11 | 4,298 | 6,816 | 63 | 1,152 | 2,787 | 45 |
| 1990 | 353 | 2,623 | 13 | 4,545 | 7,018 | 65 | 1,390 | 2,787 | 51 |
| 1991 | 406 | 2,729 | 15 | 4,864 | 7,231 | 67 | 1,580 | 2,789 | 59 |
| 1992 | 471 | 2,803 | 17 | 5,249 | 7,527 | 70 | 1,697 | 2,766 | 64 |
| 1993 | R460 | R2,862 | 16 | R5,645 | R7,981 | 71 | 1,658 | 2,682 | 68 |
| 1994 | 599 | 2,895 | 21 | 6,124 | 8,178 | 75 | 2,092 | 2,987 | 75 |

[1] For electric utilities, total deliveries data are from Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report"; deliveries for the account of others and their share of total deliveries are from EIA, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition." Because of the different reporting universes for the two data collection forms, the account-of-others share of total deliveries for electric utilities cannot be derived from the data shown on this table.

[2] Small quantities of natural gas delivered for use as vehicle fuel are included for 1990-1993.

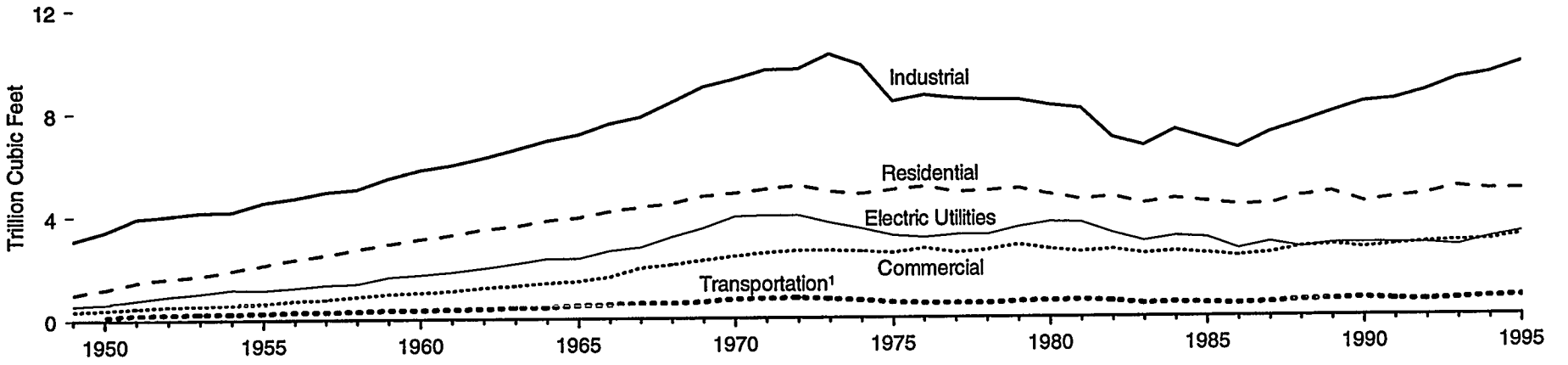
R=Revised data. NA=Not available.

Notes: • Percentages are based on data prior to rounding. • Deliveries for the account of others are deliveries to customers by transporters that do not own the natural gas but deliver it for others for a fee. Included are quantities covered by long-term contracts and quantities involved in short-term or spot market sales.

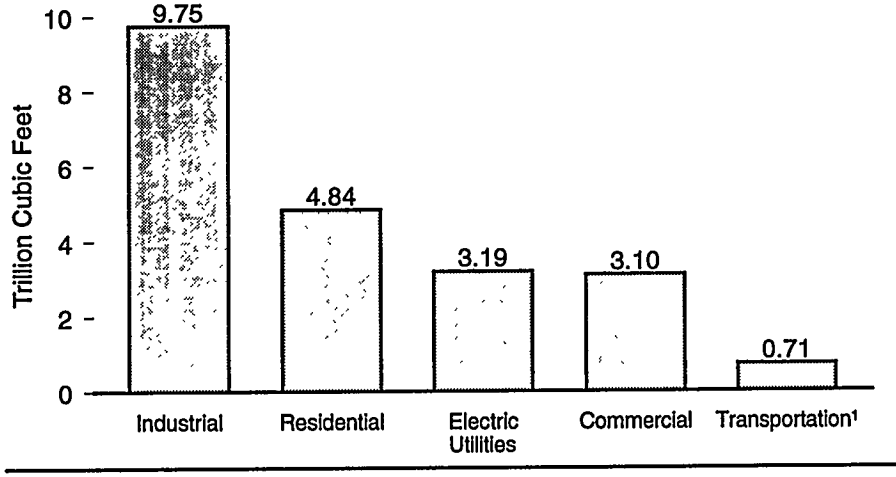
Sources: **Electric Utilities Total Deliveries:** EIA, Form EIA-759, "Monthly Power Plant Report." **All Other Data:** • 1986—EIA, *Natural Gas Annual 1990, Volume 1* (December 1991), Tables 17-20. • 1987—EIA, *Natural Gas Annual 1991* (October 1992), Tables 17-20. • 1988—EIA, *Natural Gas Annual 1992, Volume 1* (November 1993), Tables 17-20. • 1989 forward—EIA, *Natural Gas Annual 1994* (November 1995), Tables 15-18.

## Figure 6.6 Natural Gas Consumption by Sector

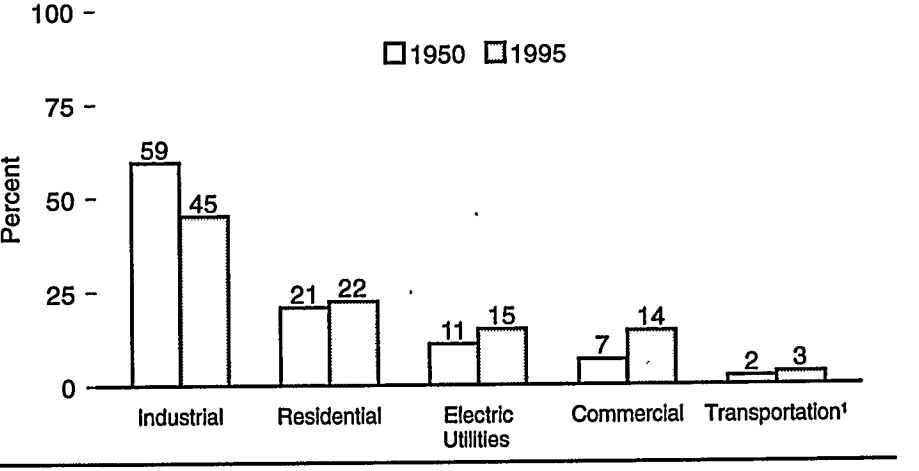
**By Sector, 1949-1995**




**By Sector, 1995**




**Shares[2] by Sector, 1950 and 1995**




[1] Pipeline fuel and vehicle fuel.

[2] Shares are based on data prior to rounding for publication and may not sum exactly to 100 percent.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 6.6.

# Table 6.6 Natural Gas Consumption by Sector, 1949-1995

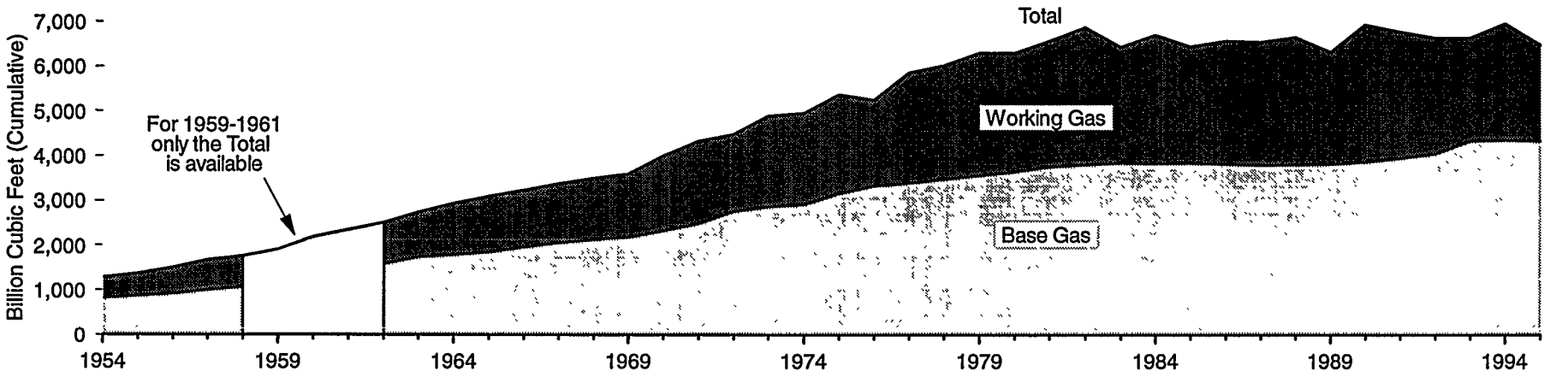
(Trillion Cubic Feet)

| Year | Residential | Commercial [1] | Industrial | | | Transportation | | | Electric Utilities | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lease and Plant Fuel | Other | Total | Pipeline Fuel [2] | Vehicle Fuel | Total | | |
| 1949 | 0.99 | 0.35 | 0.84 | 2.25 | 3.08 | NA | NA | NA | 0.55 | 4.97 |
| 1950 | 1.20 | 0.39 | 0.93 | 2.50 | 3.43 | 0.13 | NA | 0.13 | 0.63 | 5.77 |
| 1951 | 1.47 | 0.46 | 1.15 | 2.77 | 3.91 | 0.19 | NA | 0.19 | 0.76 | 6.81 |
| 1952 | 1.62 | 0.52 | 1.16 | 2.87 | 4.04 | 0.21 | NA | 0.21 | 0.91 | 7.29 |
| 1953 | 1.69 | 0.53 | 1.13 | 3.03 | 4.16 | 0.23 | NA | 0.23 | 1.03 | 7.64 |
| 1954 | 1.89 | 0.58 | 1.10 | 3.07 | 4.17 | 0.23 | NA | 0.23 | 1.17 | 8.05 |
| 1955 | 2.12 | 0.63 | 1.13 | 3.41 | 4.54 | 0.25 | NA | 0.25 | 1.15 | 8.69 |
| 1956 | 2.33 | 0.72 | 1.00 | 3.71 | 4.71 | 0.30 | NA | 0.30 | 1.24 | 9.29 |
| 1957 | 2.50 | 0.78 | 1.05 | 3.89 | 4.93 | 0.30 | NA | 0.30 | 1.34 | 9.85 |
| 1958 | 2.71 | 0.87 | 1.15 | 3.89 | 5.03 | 0.31 | NA | 0.31 | 1.37 | 10.30 |
| 1959 | 2.91 | 0.98 | 1.24 | 4.22 | 5.46 | 0.35 | NA | 0.35 | 1.63 | 11.32 |
| 1960 | 3.10 | 1.02 | 1.24 | 4.53 | 5.77 | 0.35 | NA | 0.35 | 1.72 | 11.97 |
| 1961 | 3.25 | 1.08 | 1.29 | 4.67 | 5.96 | 0.38 | NA | 0.38 | 1.83 | 12.49 |
| 1962 | 3.48 | 1.21 | 1.37 | 4.86 | 6.23 | 0.38 | NA | 0.38 | 1.97 | 13.27 |
| 1963 | 3.59 | 1.27 | 1.41 | 5.13 | 6.55 | 0.42 | NA | 0.42 | 2.14 | 13.97 |
| 1964 | 3.79 | 1.37 | 1.37 | 5.52 | 6.89 | 0.44 | NA | 0.44 | 2.32 | 14.81 |
| 1965 | 3.90 | 1.44 | 1.16 | 5.96 | 7.11 | 0.50 | NA | 0.50 | 2.32 | 15.28 |
| 1966 | 4.14 | 1.62 | 1.03 | 6.51 | 7.55 | 0.54 | NA | 0.54 | 2.61 | 16.45 |
| 1967 | 4.31 | 1.96 | 1.14 | 6.65 | 7.79 | 0.58 | NA | 0.58 | 2.75 | 17.39 |
| 1968 | 4.45 | 2.08 | 1.24 | 7.13 | 8.37 | 0.59 | NA | 0.59 | 3.15 | 18.63 |
| 1969 | 4.73 | 2.25 | 1.35 | 7.61 | 8.96 | 0.63 | NA | 0.63 | 3.49 | 20.06 |
| 1970 | 4.84 | 2.40 | 1.40 | 7.85 | 9.25 | 0.72 | NA | 0.72 | 3.93 | 21.14 |
| 1971 | 4.97 | 2.51 | 1.41 | 8.18 | 9.59 | 0.74 | NA | 0.74 | 3.98 | 21.79 |
| 1972 | 5.13 | 2.61 | 1.46 | 8.17 | 9.62 | 0.77 | NA | 0.77 | 3.98 | 22.10 |
| 1973 | 4.88 | 2.60 | 1.50 | 8.69 | 10.18 | 0.73 | NA | 0.73 | 3.66 | 22.05 |
| 1974 | 4.79 | 2.56 | 1.48 | 8.29 | 9.77 | 0.67 | NA | 0.67 | 3.44 | 21.22 |
| 1975 | 4.92 | 2.51 | 1.40 | 6.97 | 8.36 | 0.58 | NA | 0.58 | 3.16 | 19.54 |
| 1976 | 5.05 | 2.67 | 1.63 | 6.96 | 8.60 | 0.55 | NA | 0.55 | 3.08 | 19.95 |
| 1977 | 4.82 | 2.50 | 1.66 | 6.82 | 8.47 | 0.53 | NA | 0.53 | 3.19 | 19.52 |
| 1978 | 4.90 | 2.60 | 1.65 | 6.76 | 8.40 | 0.53 | NA | 0.53 | 3.19 | 19.63 |
| 1979 | 4.97 | 2.79 | 1.50 | 6.90 | 8.40 | 0.60 | NA | 0.60 | 3.49 | 20.24 |
| 1980 | 4.75 | 2.61 | 1.03 | 7.17 | 8.20 | 0.63 | NA | 0.63 | 3.68 | 19.88 |
| 1981 | 4.55 | 2.52 | 0.93 | 7.13 | 8.06 | 0.64 | NA | 0.64 | 3.64 | 19.40 |
| 1982 | 4.63 | 2.61 | 1.11 | 5.83 | 6.94 | 0.60 | NA | 0.60 | 3.23 | 18.00 |
| 1983 | 4.38 | 2.43 | 0.98 | 5.64 | 6.62 | 0.49 | NA | 0.49 | 2.91 | 16.83 |
| 1984 | 4.56 | 2.52 | 1.08 | 6.15 | 7.23 | 0.53 | NA | 0.53 | 3.11 | 17.95 |
| 1985 | 4.43 | 2.43 | 0.97 | 5.90 | 6.87 | 0.50 | NA | 0.50 | 3.04 | 17.28 |
| 1986 | 4.31 | 2.32 | 0.92 | 5.58 | 6.50 | 0.49 | NA | 0.49 | 2.60 | 16.22 |
| 1987 | 4.31 | 2.43 | 1.15 | 5.95 | 7.10 | 0.52 | NA | 0.52 | 2.84 | 17.21 |
| 1988 | 4.63 | 2.67 | 1.10 | 6.38 | 7.48 | 0.61 | NA | 0.61 | 2.64 | 18.03 |
| 1989 | 4.78 | 2.72 | 1.07 | 6.82 | 7.89 | 0.63 | NA | 0.63 | 2.79 | 18.80 |
| 1990 | 4.39 | 2.62 | 1.24 | 7.02 | 8.25 | 0.66 | (s) | 0.66 | 2.79 | 18.72 |
| 1991 | 4.56 | 2.73 | 1.13 | 7.23 | 8.36 | 0.60 | (s) | 0.60 | 2.79 | 19.04 |
| 1992 | 4.69 | 2.80 | 1.17 | 7.53 | 8.70 | 0.59 | (s) | 0.59 | 2.77 | 19.54 |
| 1993 | 4.96 | 2.86 | R1.17 | R7.98 | R9.15 | 0.62 | (s) | 0.63 | 2.68 | R20.28 |
| 1994 | R4.85 | R2.90 | R1.16 | R8.18 | R9.34 | R0.69 | (s) | R0.69 | 2.99 | R20.76 |
| 1995P | 4.84 | 3.10 | 1.23 | 8.52 | 9.75 | 0.71 | (s) | 0.71 | 3.19 | 21.60 |

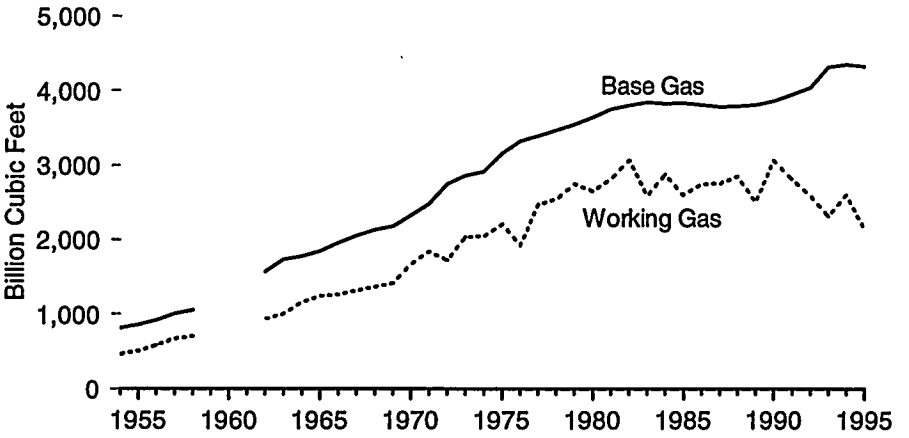
[1] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.
[2] Natural gas consumed in the operation of pipelines, primarily in compressors.
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 5 billion cubic feet.
Notes: • For the definition of natural gas consumption, see Note 1 at end of section. • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60° F. For prior years, the pressure base was 14.65 p.s.i.a. at 60° F. • Totals may not equal sum of components due to independent rounding.
Sources: • 1949-1993—Energy Information Administration (EIA), *Natural Gas Annual 1994* (November 1995), Table 101. • 1994 and 1995—EIA, *Natural Gas Monthly* (March 1996), Table 3.

## Figure 6.7 Natural Gas in Underground Storage, End of Year 1954-1995

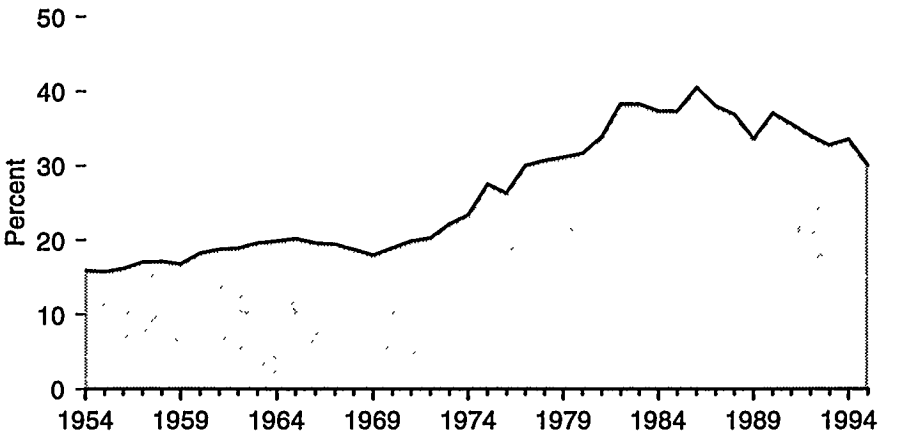
**Total**




**Base Gas and Working Gas**




**End-of-Year Storage as a Share of Total Consumption**




Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 6.6 and 6.7.

# Table 6.7 Natural Gas in Underground Storage, End of Year 1954-1995

(Billion Cubic Feet)

| Year | Base Gas [1] | Working Gas | Total [1] |
|---|---|---|---|
| 1954 | 817 | 465 | 1,281 |
| 1955 | 863 | 505 | 1,368 |
| 1956 | 919 | 583 | 1,502 |
| 1957 | 1,001 | 673 | 1,674 |
| 1958 | 1,056 | 708 | 1,764 |
| 1959 | NA | NA | 1,901 |
| 1960 | NA | NA | 2,184 |
| 1961 | NA | NA | 2,344 |
| 1962 | 1,571 | 933 | 2,504 |
| 1963 | 1,738 | 1,007 | 2,745 |
| 1964 | 1,781 | 1,159 | 2,940 |
| 1965 | 1,848 | 1,242 | 3,090 |
| 1966 | 1,958 | 1,267 | 3,225 |
| 1967 | 2,058 | 1,318 | 3,376 |
| 1968 | 2,128 | 1,366 | 3,495 |
| 1969 | 2,181 | 1,421 | 3,602 |
| 1970 | 2,326 | 1,678 | 4,004 |
| 1971 | 2,485 | 1,840 | 4,325 |
| 1972 | 2,751 | 1,729 | 4,480 |
| 1973 | 2,864 | 2,034 | 4,898 |
| 1974 | 2,912 | 2,050 | 4,962 |
| 1975 | 3,162 | 2,212 | 5,374 |
| 1976 | 3,323 | 1,926 | 5,250 |
| 1977 | 3,391 | 2,475 | 5,866 |
| 1978 | 3,473 | 2,547 | 6,020 |
| 1979 | 3,553 | 2,753 | 6,306 |
| 1980 | 3,642 | 2,655 | 6,297 |
| 1981 | 3,752 | 2,817 | 6,569 |
| 1982 | 3,808 | 3,071 | 6,879 |
| 1983 | 3,847 | 2,595 | 6,442 |
| 1984 | 3,830 | 2,876 | 6,706 |
| 1985 | 3,842 | 2,607 | 6,448 |
| 1986 | 3,819 | 2,749 | 6,567 |
| 1987 | 3,792 | 2,756 | 6,548 |
| 1988 | 3,800 | 2,850 | 6,650 |
| 1989 | 3,812 | 2,513 | 6,325 |
| 1990 | 3,868 | 3,068 | 6,936 |
| 1991 | 3,954 | 2,824 | 6,778 |
| 1992 | 4,044 | 2,597 | 6,641 |
| 1993 | 4,327 | 2,322 | 6,649 |
| 1994 | 4,359 | 2,602 | 6,960 |
| 1995 | 4,328 | 2,152 | 6,480 |

[1] Includes native gas.

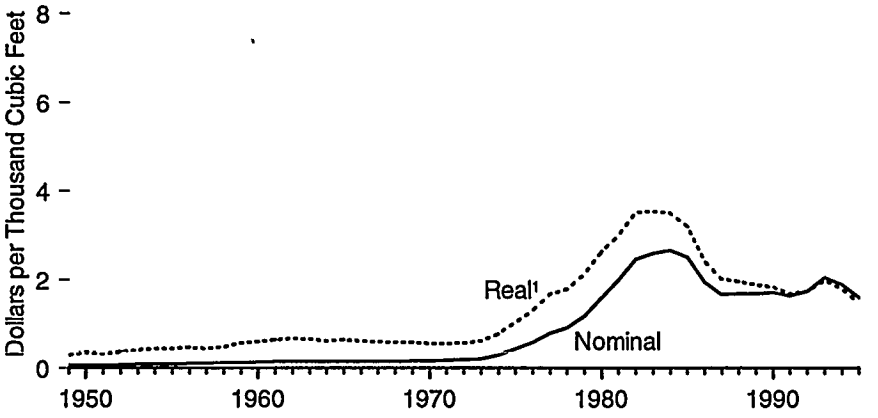
NA=Not available.

Notes: • Beginning with 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. For prior years, the pressure base was 14.65 p.s.i.a. at 60 degrees F. • Totals may not equal sum of components due to independent rounding.

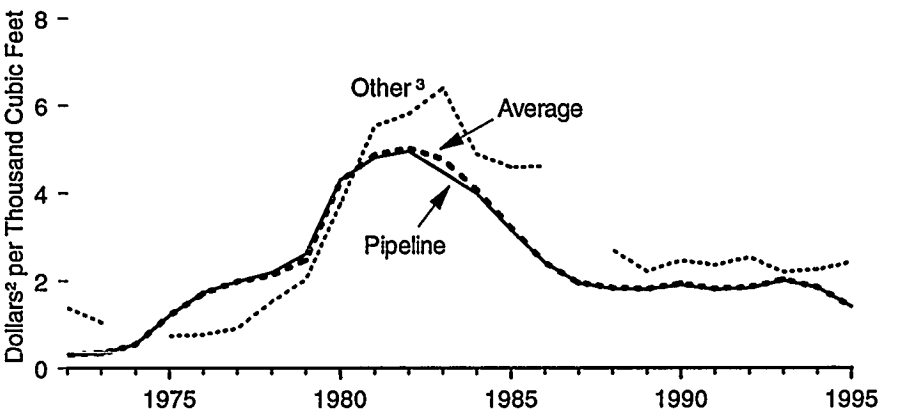
Sources: • 1954-1974—American Gas Association, *Gas Facts.* • 1975 and 1976—Federal Energy Administration, Form FEA-G318-M-O, and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1977 and 1978—Energy Information Administration (EIA), and Federal Energy Administration, Form FEA-G318-M-O, and Federal Power Commission, Form FPC-8, "Underground Gas Storage Report." • 1979-1984—EIA, Form EIA-191 and Federal Energy Regulatory Commission, Form FERC-8, "Underground Gas Storage Report." • 1985—EIA, *Natural Gas Monthly* (March 1991), Table 17. • 1986—EIA, *Natural Gas Monthly* (March 1992), Table 17. • 1987—EIA, *Natural Gas Monthly* (March 1993), Table 13. • 1988—EIA, *Natural Gas Monthly* (March 1994), Table 13. • 1989—EIA, *Natural Gas Monthly* (March 1995), Table 13. • 1990 forward—EIA, *Natural Gas Monthly* (March 1996), Table 9.

# Figure 6.8 Natural Gas Wellhead and Import Prices

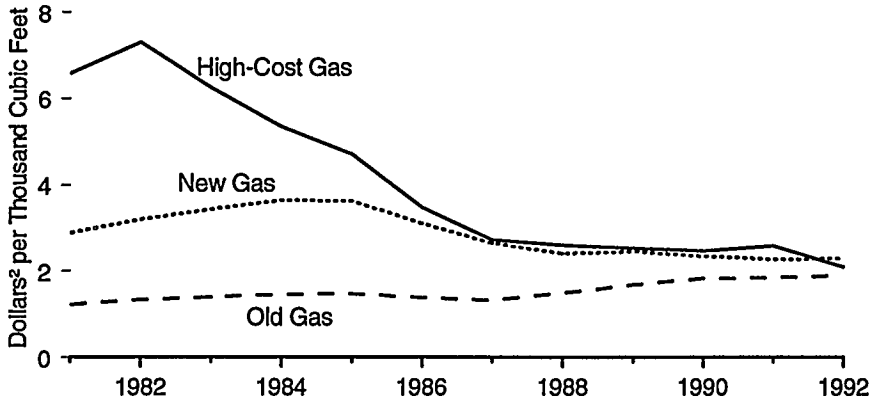
**Wellhead, 1949-1995**



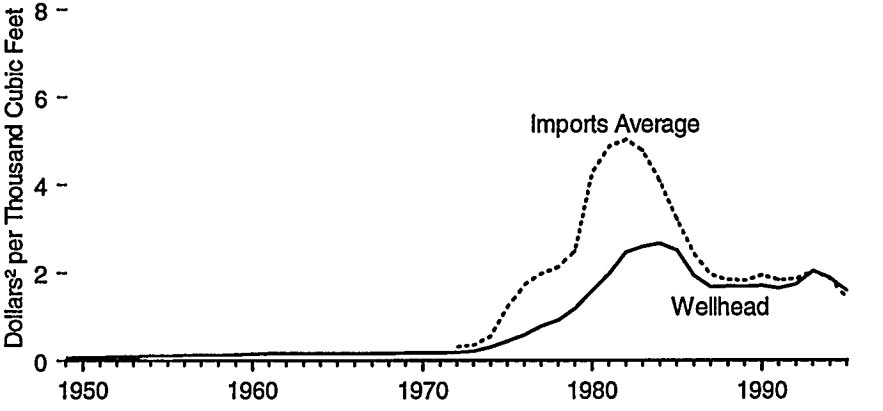

**Imports, 1972-1995**




**Purchases by NGPA[4] Categories, 1981-1992**




**Domestic and Imported Average Prices, 1949-1995**




[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[2] Nominal dollars.
[3] In 1974 and 1987, all imports were by pipeline.
[4] NGPA=Natural Gas Policy Act.
Source: Table 6.8.

# Table 6.8 Natural Gas Wellhead and Import Prices, 1949-1995

(Dollars per Thousand Cubic Feet)

| Year | Wellhead [2] | | Purchases by NGPA Categories [1] | | | Imports | | |
|---|---|---|---|---|---|---|---|---|
| | | | Old Gas | New Gas | High-Cost Gas | Pipeline | Other [3] | Average |
| | Nominal | Real [4] | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal |
| 1949 | 0.06 | ([5]) | — | — | — | NA | NA | NA |
| 1950 | 0.07 | ([5]) | — | — | — | NA | NA | NA |
| 1951 | 0.07 | ([5]) | — | — | — | NA | NA | NA |
| 1952 | 0.08 | ([5]) | — | — | — | NA | NA | NA |
| 1953 | 0.09 | ([5]) | — | — | — | NA | NA | NA |
| 1954 | 0.10 | ([5]) | — | — | — | NA | NA | NA |
| 1955 | 0.10 | ([5]) | — | — | — | NA | NA | NA |
| 1956 | 0.11 | ([5]) | — | — | — | NA | NA | NA |
| 1957 | 0.11 | ([5]) | — | — | — | NA | NA | NA |
| 1958 | 0.12 | ([5]) | — | — | — | NA | NA | NA |
| 1959 | 0.13 | R0.57 | — | — | — | NA | NA | NA |
| 1960 | 0.14 | R0.60 | — | — | — | NA | NA | NA |
| 1961 | 0.15 | R0.64 | — | — | — | NA | NA | NA |
| 1962 | 0.16 | R0.67 | — | — | — | NA | NA | NA |
| 1963 | 0.16 | R0.66 | — | — | — | NA | NA | NA |
| 1964 | 0.15 | R0.61 | — | — | — | NA | NA | NA |
| 1965 | 0.16 | R0.64 | — | — | — | NA | NA | NA |
| 1966 | 0.16 | R0.62 | — | — | — | NA | NA | NA |
| 1967 | 0.16 | R0.60 | — | — | — | NA | NA | NA |
| 1968 | 0.16 | R0.58 | — | — | — | NA | NA | NA |
| 1969 | 0.17 | R0.59 | — | — | — | NA | NA | NA |
| 1970 | 0.17 | R0.56 | — | — | — | NA | NA | NA |
| 1971 | 0.18 | R0.56 | — | — | — | 0.31 | 1.38 | 0.31 |
| 1972 | 0.19 | R0.57 | — | — | — | 0.35 | 1.05 | 0.35 |
| 1973 | 0.22 | R0.62 | — | — | — | 0.55 | ([6]) | 0.55 |
| 1974 | 0.30 | R0.78 | — | — | — | 1.21 | 0.74 | 1.21 |
| 1975 | 0.44 | R1.04 | — | — | — | 1.73 | 0.77 | 1.72 |
| 1976 | 0.58 | R1.30 | — | — | — | 1.99 | 0.92 | 1.98 |
| 1977 | 0.79 | R1.67 | — | — | — | 2.19 | 1.53 | 2.13 |
| 1978 | 0.91 | R1.78 | — | — | — | 2.61 | 2.03 | 2.49 |
| 1979 | 1.18 | R2.13 | — | — | — | 4.32 | 3.77 | 4.28 |
| 1980 | 1.59 | R2.63 | — | — | — | 4.83 | 5.54 | 4.88 |
| 1981 | 1.98 | R3.00 | 1.22 | 2.89 | 6.58 | 4.97 | 5.82 | 5.03 |
| 1982 | 2.46 | R3.51 | 1.34 | 3.19 | 7.31 | 4.49 | 6.41 | 4.78 |
| 1983 | 2.59 | R3.54 | 1.40 | 3.43 | 6.25 | 4.01 | 4.90 | 4.08 |
| 1984 | 2.66 | R3.50 | 1.45 | 3.65 | 5.35 | 3.17 | 4.60 | 3.21 |
| 1985 | 2.51 | R3.20 | 1.47 | 3.62 | 4.71 | 2.42 | R4.62 | 2.43 |
| 1986 | 1.94 | R2.41 | 1.39 | 3.11 | 3.48 | 1.95 | ([6]) | 1.95 |
| 1987 | 1.67 | R2.01 | 1.33 | 2.65 | 2.72 | 1.83 | 2.71 | 1.84 |
| 1988 | 1.69 | R1.96 | 1.49 | 2.41 | 2.61 | 1.81 | 2.22 | 1.82 |
| 1989 | 1.69 | R1.88 | 1.68 | 2.46 | 2.53 | 1.91 | 2.47 | 1.94 |
| 1990 | 1.71 | R1.83 | 1.83 | 2.35 | 2.47 | 1.81 | 2.36 | 1.83 |
| 1991 | 1.64 | R1.69 | 1.84 | 2.28 | 2.58 | 1.84 | 2.54 | 1.85 |
| 1992 | 1.74 | R1.74 | 1.91 | 2.29 | 2.10 | R2.02 | R2.20 | R2.03 |
| 1993 | R2.04 | R1.99 | — | — | — | R1.86 | R2.27 | R1.86 |
| 1994 | R1.88 | R1.79 | — | — | — | 1.42 | 2.42 | 1.42 |
| 1995E | 1.59 | 1.48 | — | — | — | | | |

[1] Projected natural gas wellhead purchase prices by major interstate pipeline companies by Natural Gas Policy Act of 1978 categories (see Note 2 at end of section).

[2] See Glossary for definition of Natural Gas Wellhead Price.

[3] Primarily liquefied natural gas from Algeria.

[4] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

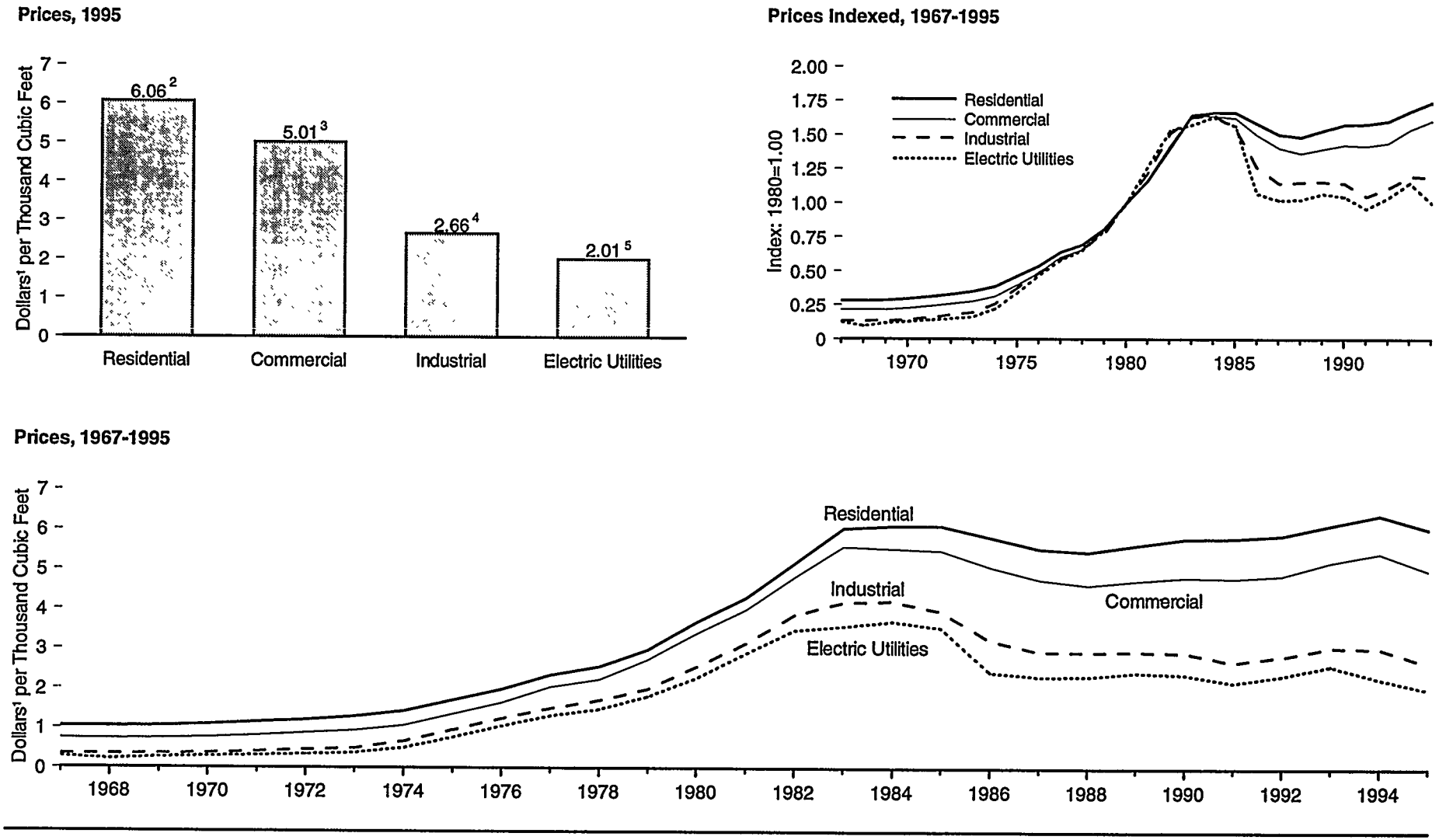
[5] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal dollars to real (inflation-adjusted) values, were not available in time to use in this report.

[6] Not applicable. All imports were by pipeline.

R=Revised data. E=Estimate. NA=Not available. — = Not applicable.

Sources: **Wellhead:** • 1949-1988—Energy Information Administration (EIA), *Natural Gas Annual 1993* (October 1994), Table 99. • 1989 forward—EIA, *Natural Gas Monthly* (March 1996), Table 4. **Old Gas, 1981-1986 and New Gas, 1981:** EIA, *Natural Gas Monthly*, November 1987 (January 1988), Table 5. **New Gas, 1982-1986:** EIA, *Natural Gas Monthly*, January 1988 (March 1988), Table 5. **High-Cost Gas:** • 1981-1983—EIA, *Natural Gas Monthly*, December 1984 (February 1985), Table 22. • 1984-1986—EIA, *Natural Gas Monthly*, December 1987 (February 1988), Table 5. **Old Gas, New Gas, and High-Cost Gas:** • 1987-1992—EIA, *Natural Gas Monthly* (February 1993), Table 5. **Imports:** • 1972 and 1973—Federal Power Commission (FPC), *Pipeline Imports and Exports of Natural Gas - Imports and Exports of LNG.* • 1974-1976—FPC, *United States Imports and Exports of Natural Gas*, annual. • 1977-1988—EIA, *Natural Gas Monthly* (August 1994), Table FE7. • 1989 forward—EIA, *Natural Gas Monthly* (March 1996), Table 5.

# Figure 6.9 Natural Gas Prices by Sector




[1] Nominal dollars.
[2] Based on 100 percent of volume delivered.
[3] Based on 70.3 percent of volume delivered.
[4] Based on 21.3 percent of volume delivered.
[5] Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.

Source: Table 6.9.

# Table 6.9 Natural Gas Prices by Sector, 1967-1995

(Price: Dollars[1] per Thousand Cubic Feet; Share of Total Volume Delivered: Percentage)

| | Residential | Commercial[2] | | Industrial | | Vehicle Fuel[3] | | Electric Utilities |
|---|---|---|---|---|---|---|---|---|
| Year | Price[4] | Price | Share of Total Volume Delivered | Price | Share of Total Volume Delivered | Price | Share of Total Volume Delivered | Price[5] |
| 1967 | 1.04 | 0.74 | NA | 0.34 | NA | NA | NA | 0.28 |
| 1968 | 1.04 | 0.73 | NA | 0.34 | NA | NA | NA | 0.22 |
| 1969 | 1.05 | 0.74 | NA | 0.35 | NA | NA | NA | 0.27 |
| 1970 | 1.09 | 0.77 | NA | 0.37 | NA | NA | NA | 0.29 |
| 1971 | 1.15 | 0.82 | NA | 0.41 | NA | NA | NA | 0.32 |
| 1972 | 1.21 | 0.88 | NA | 0.45 | NA | NA | NA | 0.34 |
| 1973 | 1.29 | 0.94 | NA | 0.50 | NA | NA | NA | 0.38 |
| 1974 | 1.43 | 1.07 | NA | 0.67 | NA | NA | NA | 0.51 |
| 1975 | 1.71 | 1.35 | NA | 0.96 | NA | NA | NA | 0.77 |
| 1976 | 1.98 | 1.64 | NA | 1.24 | NA | NA | NA | 1.06 |
| 1977 | 2.35 | 2.04 | NA | 1.50 | NA | NA | NA | 1.32 |
| 1978 | 2.56 | 2.23 | NA | 1.70 | NA | NA | NA | 1.48 |
| 1979 | 2.98 | 2.73 | NA | 1.99 | NA | NA | NA | 1.81 |
| 1980 | 3.68 | 3.39 | NA | 2.56 | NA | NA | NA | 2.27 |
| 1981 | 4.29 | 4.00 | NA | 3.14 | NA | NA | NA | 2.89 |
| 1982 | 5.17 | 4.82 | NA | 3.87 | 85.1 | NA | NA | 3.48 |
| 1983 | 6.06 | 5.59 | NA | 4.18 | 80.7 | NA | NA | 3.58 |
| 1984 | 6.12 | 5.55 | NA | 4.22 | 74.7 | NA | NA | 3.70 |
| 1985 | 6.12 | 5.50 | NA | 3.95 | 68.8 | NA | NA | 3.55 |
| 1986 | 5.83 | 5.08 | NA | 3.23 | 59.8 | NA | NA | 2.43 |
| 1987 | 5.54 | 4.77 | 93.1 | 2.94 | 47.4 | NA | NA | 2.32 |
| 1988 | 5.47 | 4.63 | 90.7 | 2.95 | 42.6 | NA | NA | 2.33 |
| 1989 | 5.64 | 4.74 | 89.1 | 2.96 | R36.9 | NA | NA | 2.43 |
| 1990 | 5.80 | 4.83 | 86.6 | 2.93 | 35.2 | 3.39 | NA | 2.38 |
| 1991 | 5.82 | 4.81 | 85.1 | 2.69 | 32.7 | 3.96 | NA | 2.18 |
| 1992 | 5.89 | 4.88 | 83.2 | 2.84 | R30.3 | 4.05 | NA | 2.36 |
| 1993 | 6.16 | 5.22 | R83.9 | 3.07 | R29.7 | 4.27 | 87.8 | 2.61 |
| 1994 | R6.41 | R5.44 | R79.3 | R3.05 | R25.5 | R4.13 | R86.9 | R2.28 |
| 1995P | 6.06 | 5.01 | 70.3 | 2.66 | 21.3 | NA | NA | 2.01 |

[1] Nominal dollars.
[2] Includes deliveries to municipalities and public authorities for institutional heating and other purposes.
[3] Much of the natural gas delivered for vehicle fuel represents deliveries to fueling stations that are used primarily or exclusively by respondents' fleet vehicles. Thus, the prices are often those associated with the operation of fleet vehicles.
[4] Based on 100 percent of volume delivered.
[5] Based on all steam-electric utility plants with a combined capacity of 50 megawatts or greater.
R=Revised data. P=Preliminary data. NA=Not available.
Notes: • Dry natural gas, including supplemental gaseous fuels. • Residential, commercial, and industrial price data represent prices of natural gas sold and delivered by local distribution companies to residential, commercial, and industrial consumers, respectively. The data do not reflect prices of natural gas transported for the account of others. • The average for each end-use sector is calculated by dividing the total value of the gas consumed by each sector by the total quantity consumed. See Note 1 at end of section.

Sources: **Vehicle Fuel:** • 1990-1994—EIA, *Natural Gas Annual 1994* (November 1995), Table 102. **All Other Data:** • 1967-1989—EIA, *Natural Gas Annual 1994* (November 1995), Table 102. • 1990 forward—EIA, *Natural Gas Monthly* (March 1996), Table 4.

## Natural Gas Notes

1. Natural gas consumption statistics are compiled from surveys of natural gas production, transmission, and distribution companies and electric utility companies. Consumption by sector from these surveys is compiled on a national and individual State basis and then balanced with national and individual State supply data. Included in the data are the following: Commercial Sector—consumption by nonmanufacturing establishments, by municipalities for institutional heating and lighting, and those engaged in agriculture, forestry, and fishing; Electric Utility Sector—consumption by electric utilities for the generation of electric power; Industrial Sector—consumption by establishments engaged primarily in processing unfinished materials into another form of product (includes mining, petroleum refining, manufacturing, and natural gas industry use for lease and plant fuel); Residential Sector—consumption by private households for space heating, cooking, and other household uses; Transportation Sector—natural gas transmission (pipeline) fuel.

2. **Natural Gas Prices by Natural Gas Policy Act of 1978 (NGPA) Categories: Old Gas:** Includes natural gas dedicated to interstate commerce and natural gas purchased under existing interstate or rollover contracts (NGPA Sections 104, 105, and 106). **New Gas:** Includes new natural gas and certain natural gas produced from the Outer Continental Shelf, stripper well gas, and other new gas categories (NGPA Sections 102, 103, 108, and 109). **High-Cost Gas:** Includes natural gas from deep wells and low permeability (tight) reservoirs and unregulated gas (NGPA Section 107).

# 7. Coal

## Changing Patterns of Coal Production

In 1995, estimated production of all types of coal totaled 1,030 million short tons, the second highest total ever (7.1).* The 1995 total was 3.8 million short tons below the 1994 record level of 1,034 million short tons.

Of all coal production, bituminous and subbituminous coal accounted for by far the largest share (91 percent) in 1995 (7.2). Lignite and anthracite accounted for the remainder of coal produced. Anthracite, which is mined in northeastern Pennsylvania and is known for its superior burning qualities, accounts for a diminishing share of total coal production. In 1949, anthracite accounted for 8.9 percent of the total; by 1995, its share had shrunk to 0.4 percent.

More coal is mined east of the Mississippi than in the West, but the West's share of total production increased almost every year after 1965 (7.2). That year, production of western coal was 27 million short tons, 5.2 percent of the total. By 1995, western production had increased by a factor of 18, to 488 million short tons (47 percent of the total). The growth in western coal production was due in part to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

Production of coke, which is generally made from bituminous coal, trended downward during the 1949-to-1995 period, particularly after 1981. In 1995, coke production totaled 24 million short tons (7.7). The decline in coke production was due to a decline in the use of coke by the U.S. iron and steel industry, the principal consumer of coke.

## Domestic Markets: Changes in Coal End Use

Electric utilities are the dominant consumers of coal (7.3). Their consumption grew from 84 million short tons, a 17-percent share, in 1949, to 829 million short tons, an 88-percent share, in 1995. By contrast, consumption by all other economic sectors in 1995 was lower than it had been in 1949. The most dramatic declines occurred in the transportation sector, where railroads switched to petroleum, and in the residential and commercial sector. In 1949, those two sectors accounted for 187 million short tons, 39 percent of total coal consumption. By 1995, their consumption totaled 5.8 million short tons, less than 1 percent of U.S. coal consumption.

Consumption by the industrial sector, including coke plants, trended downward after the mid-1960's. From 205 million short tons in 1966, industrial consumption fell to about 112 million short tons in 1986 and 1987. In 1988, growth in manufacturing activity was accompanied by a modest increase in industrial consumption, which rose to 118 million short tons. In 1989, industrial consumption fell to 117 million short tons, and, through 1995, slow growth in the economy restrained industrial demand for coal. In 1995, industrial consumption totaled 106 million short tons, down 1.0 percent from the 1994 level.

### Coal Mining Productivity

The average productivity of all types of mines in the United States increased each year from 1949 to 1969, when it reached 2.4 short tons per miner hour (7.6). Productivity during the 1970's and early 1980's was lower, due primarily to the coal industry's compliance with the Federal Coal Mine Health and Safety Act of 1969, as well as to environmental and other factors.

The growing importance of surface coal mining, where productivity is generally higher than for underground mining, and the closing of non-productive mines, led to increases in average productivity during the 1980's and 1990's. In 1994, average productivity in all types of mines (excluding anthracite) reached an all-time high of 5.0 short tons per miner hour. That year, productivity of underground mines (excluding anthracite) was 3.2 short tons per miner hour and productivity of surface mines (excluding anthracite) was 7.8 short tons per miner hour.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Foreign Markets

Since World War II, coal has been the United States' major energy export (1.4). Throughout most of the 1960's and 1970's, U.S. exports of coal increased, peaking at 113 million short tons in 1981 (7.4). Increased shipments to Canada, Japan, and European markets contributed to the growth. The level of U.S. coal exports fluctuated throughout the 1980's, falling as low as 78 million short tons in 1983 but attaining 95 million short tons in 1988. That year, difficulties experienced by competing countries (particularly China, Australia, and Poland) allowed the United States to recapture some export markets, and thereafter coal exports rose each year through 1991, when coal exports totaled 109 million short tons. In 1992, coal exports fell to 103 million short tons and in 1993, the continuing weakness of the European economy and ongoing subsidies for domestic European coal caused exports to fall dramatically to 75 million short tons. In 1994, coal exports fell to 71 million short tons, the lowest level in 15 years. In 1995, however, coal exports to almost all countries increased and the U.S. total rose to 89 million short tons, up 24 percent from the 1994 level. Japan, Canada, and Italy remained the three largest foreign purchasers of U.S. coal.

## Prices

In 1995, the average real price[1] of bituminous coal and lignite at the minemouth fell to $17.67 per short ton, down for the sixteenth year in a row (7.8). The 1995 price was less than half of the peak real price of $45.57 per short ton recorded in 1975. The average real price of anthracite of $33.95 per short ton was also well below the 1975 peak of $76.45 per short ton. The decline in coal prices was the result of gains in productivity, the expanded use of longwall mining in underground mines, and the increased use of less-expensive western coal.

From 1961 on, electric utilities were the primary consumers of coal (7.3). Throughout the 1960's, the average real price of coal delivered to electric utilities declined (7.8). However, when prices of other fossil fuels rose rapidly after 1973, coal prices at electric utilities also increased, from $25.45 per short ton in 1973 to $40.16 per short ton the following year. (Despite that increase, coal remained the least expensive fossil fuel, on a Btu basis.) The price of coal at electric utilities gradually rose after 1974, peaking at $49.80 per short ton in 1982, and then declined each year through 1995, by which time the price had fallen to $25.20 per short ton.

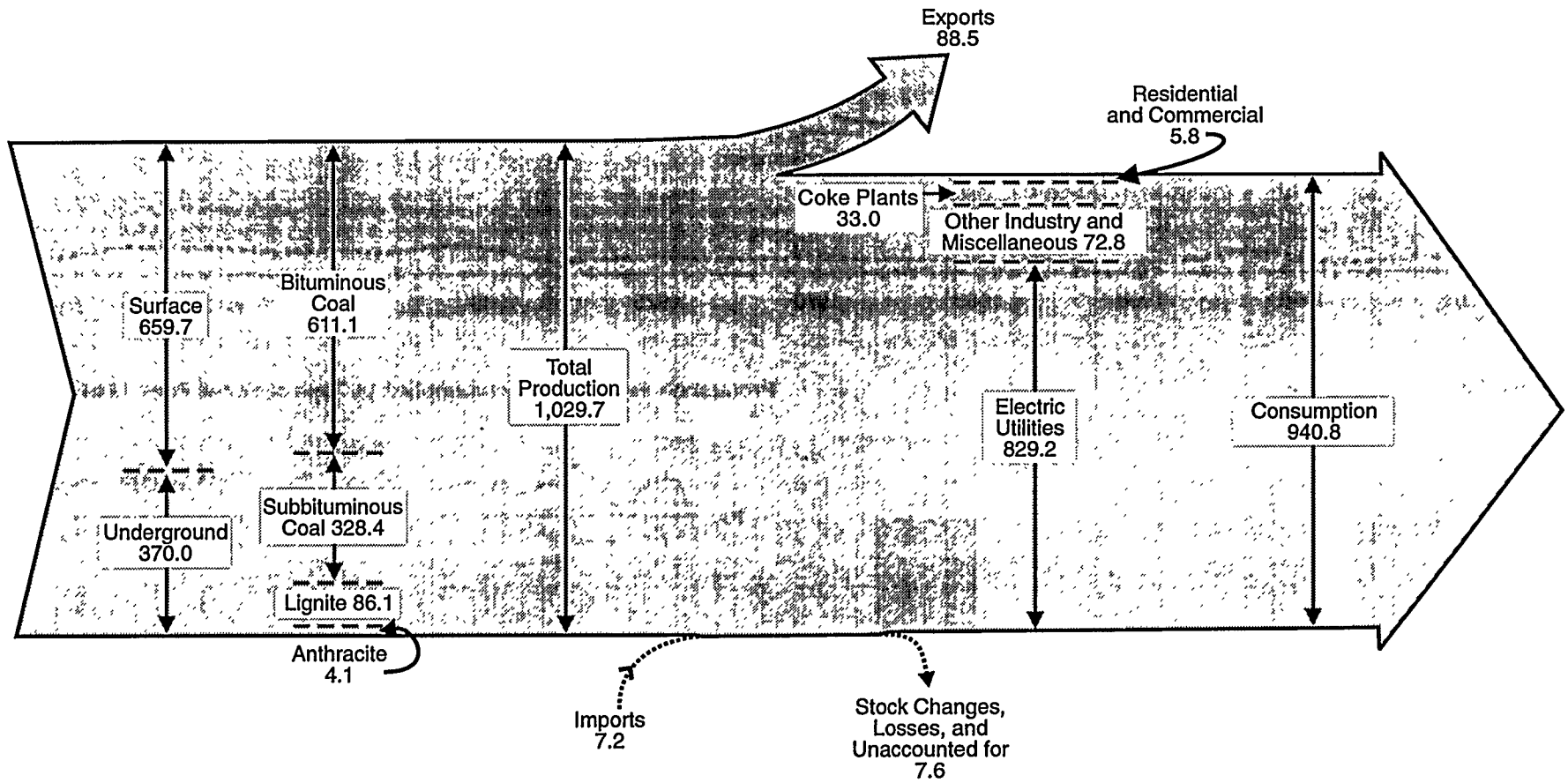
## Stocks

Although there is little seasonal variation in demand, production of coal can vary considerably due to such factors as coal miners' strikes and bad weather. To compensate for possible supply interruptions, coal producers and distributors, as well as such major consumers as electric utilities and coke plants, generally maintain large stockpiles. For example, wildcat strikes in 1989 resulted in year-end stocks of 175 million short tons, the lowest level since 1978 (7.5). Similarly, in 1993, a series of strikes by the United Mine Workers of America led to lower levels of coal production and stocks were drawn down to compensate. At year end, coal stocks totaled 146 million short tons. In 1994, a major stock build-up by electric utilities brought year-end stocks to 169 million short tons, and, in 1995, year-end stocks remained at that level.

In 1995, electric utilities held three-fourths of the coal, and coal producers and distributors held most of the remainder. Stocks at coke plants and other industrial sites were relatively small.

[1]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.

## Diagram 4. Coal Flow, 1995
(Million Short Tons)

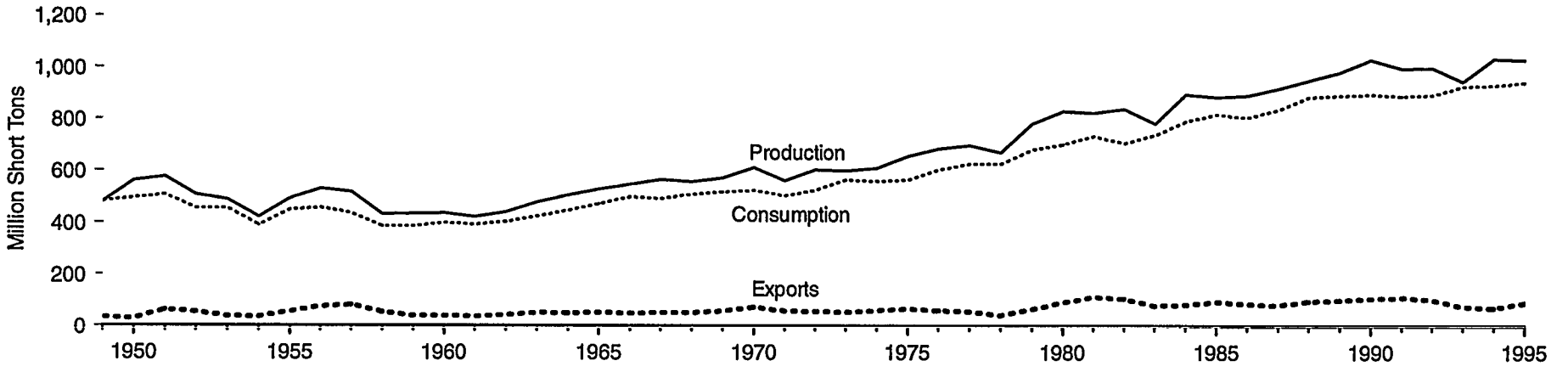



Notes: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.

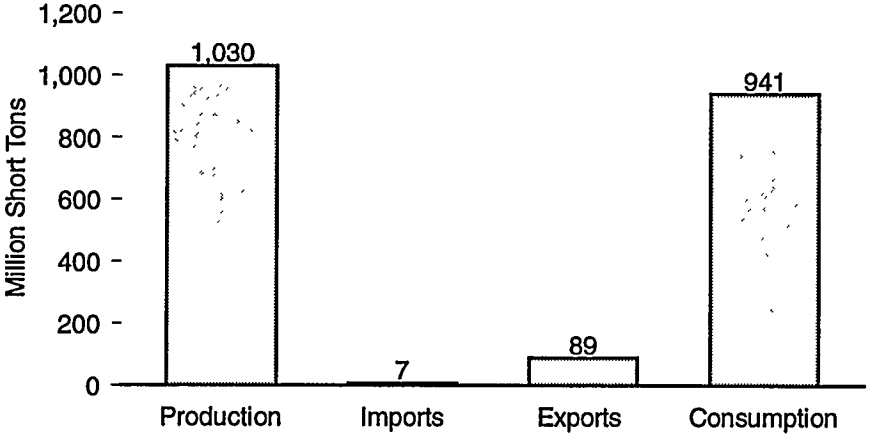
Sources: Tables 7.1, 7.2, and 7.3.

# Figure 7.1 Coal Overview

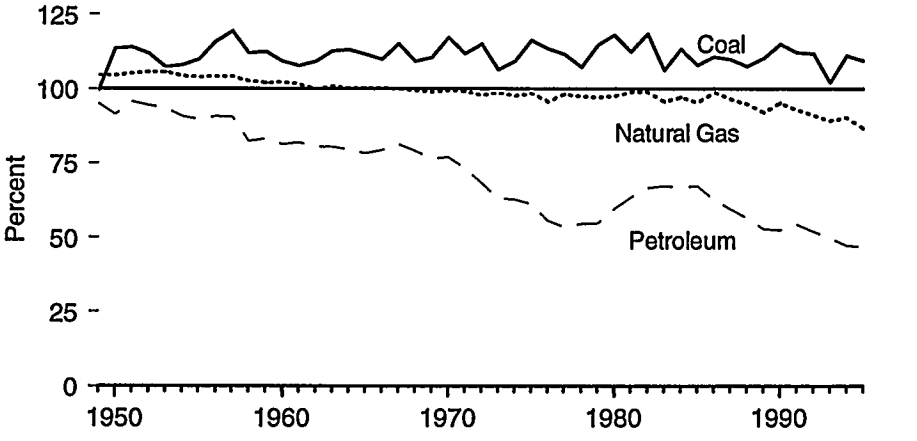
**Overview, 1949-1995**




**Overview, 1995**




**Production as Share of Consumption by Type of Fossil Fuel, 1949-1995**




Sources: Tables 5.1, 6.1, and 7.1.

# Table 7.1 Coal Overview, 1949-1995

(Million Short Tons)

| Year | Production | Imports | Exports | Stock Changes, Losses, and Unaccounted for [1] | Consumption |
|---|---|---|---|---|---|
| 1949 | 480.6 | 0.3 | 32.8 | 35.1 | 483.2 |
| 1950 | 560.4 | 0.4 | 29.4 | -37.3 | 494.1 |
| 1951 | 576.3 | 0.3 | 62.7 | -8.1 | 505.9 |
| 1952 | 507.4 | 0.3 | 52.2 | -1.4 | 454.1 |
| 1953 | 488.2 | 0.3 | 36.5 | 2.8 | 454.8 |
| 1954 | 420.8 | 0.2 | 33.9 | 2.8 | 389.9 |
| 1955 | 490.8 | 0.3 | 54.4 | 10.3 | 447.0 |
| 1956 | 529.8 | 0.4 | 73.8 | 0.5 | 456.9 |
| 1957 | 518.0 | 0.4 | 80.8 | -3.2 | 434.5 |
| 1958 | 431.6 | 0.3 | 52.6 | 6.4 | 385.7 |
| 1959 | 432.7 | 0.4 | 39.0 | -9.0 | 385.1 |
| 1960 | 434.3 | 0.3 | 38.0 | 1.5 | 398.1 |
| 1961 | 420.4 | 0.2 | 36.4 | 6.2 | 390.4 |
| 1962 | 439.0 | 0.2 | 40.2 | 3.2 | 402.3 |
| 1963 | 477.2 | 0.3 | 50.4 | -3.6 | 423.5 |
| 1964 | 504.2 | 0.3 | 49.5 | -9.3 | 445.7 |
| 1965 | 527.0 | 0.2 | 51.0 | -4.1 | 472.0 |
| 1966 | 546.8 | 0.2 | 50.1 | 0.8 | 497.7 |
| 1967 | 564.9 | 0.2 | 50.1 | -23.6 | 491.4 |
| 1968 | 556.7 | 0.2 | 51.2 | 4.1 | 509.8 |
| 1969 | 571.0 | 0.1 | 56.9 | 2.2 | 516.4 |
| 1970 | 612.7 | (s) | 71.7 | -17.7 | 523.2 |
| 1971 | 560.9 | 0.1 | 57.3 | -2.2 | 501.6 |
| 1972 | 602.5 | (s) | 56.7 | -21.5 | 524.3 |
| 1973 | 598.6 | 0.1 | 53.6 | 17.5 | 562.6 |
| 1974 | 610.0 | 2.1 | 60.7 | 7.0 | 558.4 |
| 1975 | 654.6 | 0.9 | 66.3 | -26.6 | 562.6 |
| 1976 | 684.9 | 1.2 | 60.0 | -22.3 | 603.8 |
| 1977 | 697.2 | 1.6 | 54.3 | -19.2 | 625.3 |
| 1978 | 670.2 | 3.0 | 40.7 | -7.2 | 625.2 |
| 1979 | 781.1 | 2.1 | 66.0 | -36.6 | 680.5 |
| 1980 | 829.7 | 1.2 | 91.7 | -36.4 | 702.7 |
| 1981 | 823.8 | 1.0 | 112.5 | 20.3 | 732.6 |
| 1982 | 838.1 | 0.7 | 106.3 | -25.7 | 706.9 |
| 1983 | 782.1 | 1.3 | 77.8 | 31.1 | 736.7 |
| 1984 | 895.9 | 1.3 | 81.5 | -24.4 | 791.3 |
| 1985 | 883.6 | 2.0 | 92.7 | 25.1 | 818.0 |
| 1986 | 890.3 | 2.2 | 85.5 | -2.8 | 804.2 |
| 1987 | 918.8 | 1.7 | 79.6 | -4.0 | 836.9 |
| 1988 | 950.3 | 2.1 | 95.0 | 26.3 | 883.6 |
| 1989 | 980.7 | 2.9 | 100.8 | 6.9 | 889.7 |
| 1990 | 1,029.1 | 2.7 | 105.8 | -30.5 | 895.5 |
| 1991 | 996.0 | 3.4 | 109.0 | -2.8 | 887.6 |
| 1992 | 997.5 | 3.8 | 102.5 | -6.4 | 892.4 |
| 1993 | 945.4 | 7.3 | 74.5 | 47.7 | 925.9 |
| 1994 | R1,033.5 | 7.6 | 71.4 | R-39.5 | R930.2 |
| 1995 | 1,029.7 | 7.2 | 88.5 | -7.6 | 940.8 |

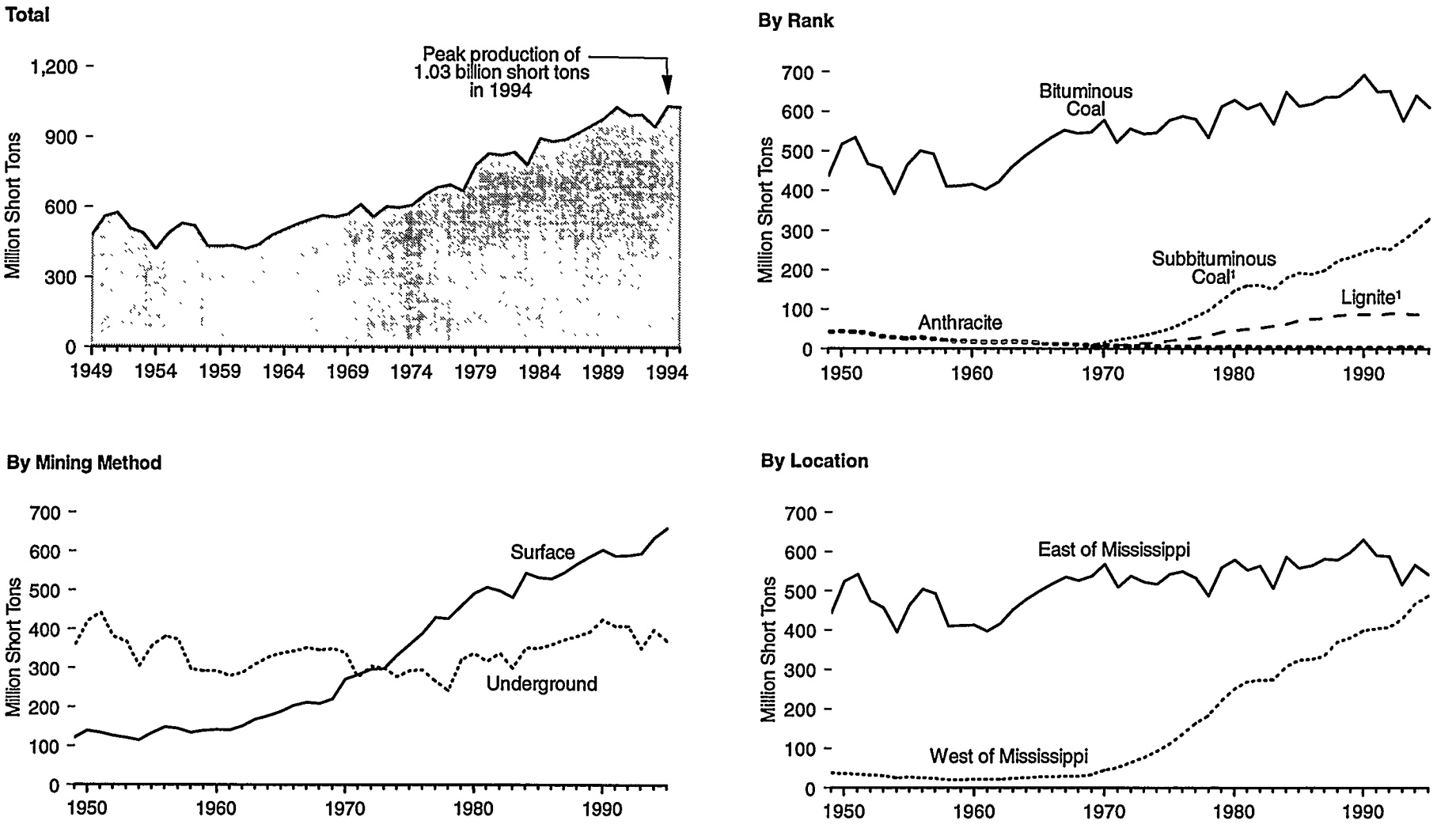
[1] Includes changes in stocks at electric utilities, coke plants, other industries, retail dealers, producers/distributors, and the balancing item of losses and unaccounted for.

R=Revised data. (s)=Less than 0.05 million short tons.

Note: • Data do not include consumption by nonutilities in SIC 49, "Electric Services." • Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Reports, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978* and *Coal-Pennsylvania Anthracite 1977; 1978.* • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report.* • 1981-1994—EIA, *Weekly Coal Production, Coal Production* (annual), *Coal Industry Annual 1995,* (December 1994), and *Quarterly Coal Report October-December 1995* (May 1996), Table 1. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 6.1.

## Figure 7.2 Coal Production, 1949-1995




[1] Included with bituminous coal prior to 1969.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.2.

# Table 7.2 Coal Production, 1949-1995

(Million Short Tons)

| Year | Rank | | | | Mining Method | | Location | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Bituminous Coal | Subbituminous Coal | Lignite | Anthracite | Underground | Surface | West of the Mississippi | East of the Mississippi | |
| 1949 | 437.9 | ([1]) | ([1]) | 42.7 | 358.9 | 121.7 | 36.4 | 444.2 | 480.6 |
| 1950 | 516.3 | ([1]) | ([1]) | 44.1 | 421.0 | 139.4 | 36.0 | 524.4 | 560.4 |
| 1951 | 533.7 | ([1]) | ([1]) | 42.7 | 442.2 | 134.2 | 34.6 | 541.7 | 576.3 |
| 1952 | 466.8 | ([1]) | ([1]) | 40.6 | 381.2 | 126.3 | 32.7 | 474.8 | 507.4 |
| 1953 | 457.3 | ([1]) | ([1]) | 30.9 | 367.4 | 120.8 | 30.6 | 457.7 | 488.2 |
| 1954 | 391.7 | ([1]) | ([1]) | 29.1 | 306.0 | 114.8 | 25.4 | 395.4 | 420.8 |
| 1955 | 464.6 | ([1]) | ([1]) | 26.2 | 358.0 | 132.9 | 26.6 | 464.2 | 490.8 |
| 1956 | 500.9 | ([1]) | ([1]) | 28.9 | 380.8 | 148.9 | 25.8 | 504.0 | 529.8 |
| 1957 | 492.7 | ([1]) | ([1]) | 25.3 | 373.6 | 144.5 | 24.7 | 493.4 | 518.0 |
| 1958 | 410.4 | ([1]) | ([1]) | 21.2 | 297.6 | 134.0 | 20.3 | 411.3 | 431.6 |
| 1959 | 412.0 | ([1]) | ([1]) | 20.6 | 292.8 | 139.8 | 20.3 | 412.4 | 432.7 |
| 1960 | 415.5 | ([1]) | ([1]) | 18.8 | 292.6 | 141.7 | 21.3 | 413.0 | 434.3 |
| 1961 | 403.0 | ([1]) | ([1]) | 17.4 | 279.6 | 140.9 | 21.8 | 398.6 | 420.4 |
| 1962 | 422.1 | ([1]) | ([1]) | 16.9 | 287.9 | 151.1 | 21.4 | 417.6 | 439.0 |
| 1963 | 458.9 | ([1]) | ([1]) | 18.3 | 309.0 | 168.2 | 23.7 | 453.5 | 477.2 |
| 1964 | 487.0 | ([1]) | ([1]) | 17.2 | 327.7 | 176.5 | 25.7 | 478.5 | 504.2 |
| 1965 | 512.1 | ([1]) | ([1]) | 14.9 | 338.0 | 189.0 | 27.4 | 499.5 | 527.0 |
| 1966 | 533.9 | ([1]) | ([1]) | 12.9 | 342.6 | 204.2 | 28.0 | 518.8 | 546.8 |
| 1967 | 552.6 | ([1]) | ([1]) | 12.3 | 352.4 | 212.5 | 28.9 | 536.0 | 564.9 |
| 1968 | 545.2 | ([1]) | ([1]) | 11.5 | 346.6 | 210.1 | 29.7 | 527.0 | 556.7 |
| 1969 | 547.2 | 8.3 | 5.0 | 10.5 | 349.2 | 221.7 | 33.3 | 537.7 | 571.0 |
| 1970 | 578.5 | 16.4 | 8.0 | 9.7 | 340.5 | 272.1 | 44.9 | 567.8 | 612.7 |
| 1971 | 521.3 | 22.2 | 8.7 | 8.7 | 277.2 | 283.7 | 51.0 | 509.9 | 560.9 |
| 1972 | 556.8 | 27.5 | 11.0 | 7.1 | 305.0 | 297.4 | 64.3 | 538.2 | 602.5 |
| 1973 | 543.5 | 33.9 | 14.3 | 6.8 | 300.1 | 298.5 | 76.4 | 522.1 | 598.6 |
| 1974 | 545.7 | 42.2 | 15.5 | 6.6 | 278.0 | 332.1 | 91.9 | 518.1 | 610.0 |
| 1975 | 577.5 | 51.1 | 19.8 | 6.2 | 293.5 | 361.2 | 110.9 | 543.7 | 654.6 |
| 1976 | 588.4 | 64.8 | 25.5 | 6.2 | 295.5 | 389.4 | 136.1 | 548.8 | 684.9 |
| 1977 | 581.0 | 82.1 | 28.2 | 5.9 | 266.6 | 430.6 | 163.9 | 533.3 | 697.2 |
| 1978 | 534.0 | 96.8 | 34.4 | 5.0 | 242.8 | 427.4 | 183.0 | 487.2 | 670.2 |
| 1979 | 612.3 | 121.5 | 42.5 | 4.8 | 320.9 | 460.2 | 221.4 | 559.7 | 781.1 |
| 1980 | 628.8 | 147.7 | 47.2 | 6.1 | 337.5 | 492.2 | 251.0 | 578.7 | 829.7 |
| 1981 | 608.0 | 159.7 | 50.7 | 5.4 | 316.5 | 507.3 | 269.9 | 553.9 | 823.8 |
| 1982 | 620.2 | 160.9 | 52.4 | 4.6 | 339.2 | 499.0 | 273.9 | 564.3 | 838.1 |
| 1983 | 568.6 | 151.0 | 58.3 | 4.1 | 300.4 | 481.7 | 274.7 | 507.4 | 782.1 |
| 1984 | 649.5 | 179.2 | 63.1 | 4.2 | 352.1 | 543.9 | 308.3 | 587.6 | 895.9 |
| 1985 | 613.9 | 192.7 | 72.4 | 4.7 | 350.8 | 532.8 | 324.9 | 558.7 | 883.6 |
| 1986 | 620.1 | 189.6 | 76.4 | 4.3 | 360.4 | 529.9 | 325.9 | 564.4 | 890.3 |
| 1987 | 636.6 | 200.2 | 78.4 | 3.6 | 372.9 | 545.9 | 336.8 | 581.9 | 918.8 |
| 1988 | 638.1 | 223.5 | 85.1 | 3.6 | 382.2 | 568.1 | 370.7 | 579.6 | 950.3 |
| 1989 | 659.8 | 231.2 | 86.4 | 3.3 | 393.8 | 586.9 | 381.7 | 599.0 | 980.7 |
| 1990 | 693.2 | 244.3 | 88.1 | 3.5 | 424.5 | 604.5 | 398.9 | 630.2 | 1,029.1 |
| 1991 | 650.7 | 255.3 | 86.5 | 3.4 | 407.2 | 588.8 | 404.7 | 591.3 | 996.0 |
| 1992 | 651.9 | 252.1 | 90.1 | 3.5 | 407.2 | 590.3 | 409.0 | 588.6 | 997.5 |
| 1993 | 576.7 | 274.9 | 89.5 | 4.3 | 351.1 | 594.4 | 429.2 | 516.2 | 945.4 |
| 1994 | [R]640.3 | [R]300.5 | [R]88.1 | 4.6 | [R]399.1 | [R]634.4 | [R]467.2 | [R]566.3 | 1,033.5 |
| 1995[E] | 611.1 | 328.4 | 86.1 | 4.1 | 370.0 | 659.7 | 487.5 | 542.2 | 1,029.7 |

[1] Included in bituminous coal.

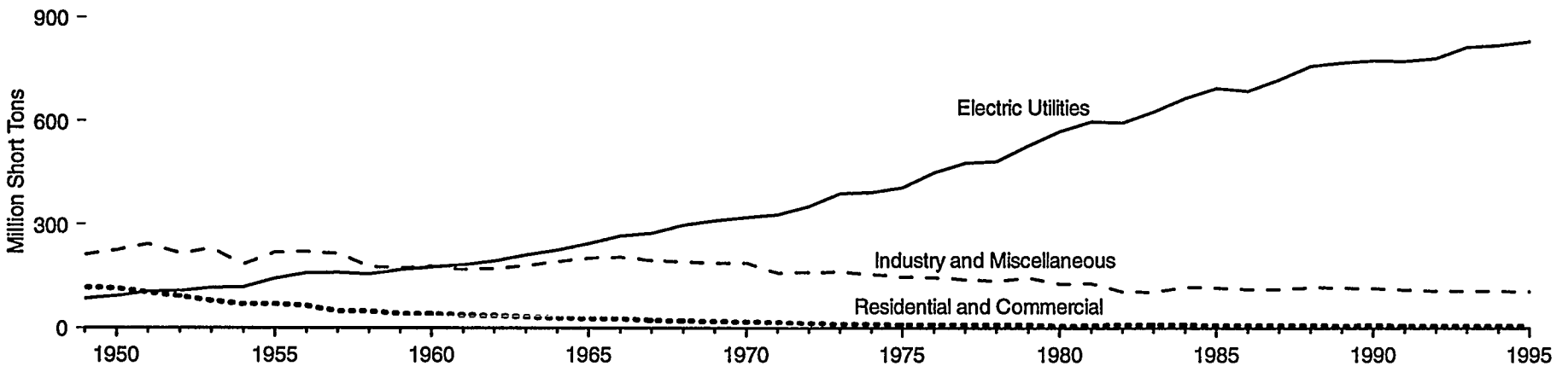
R=Revised data. E=Estimate.

Note: Totals may not equal sum of components due to independent rounding.

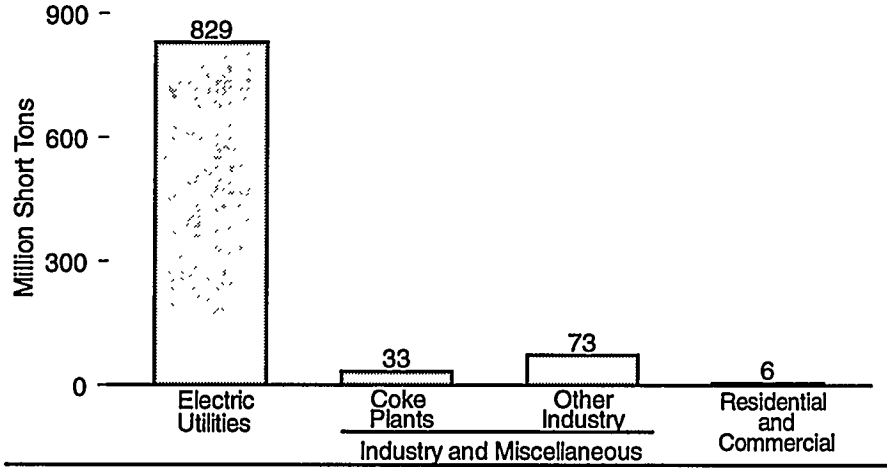
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978, Coal-Pennsylvania Anthracite 1977; 1978*, and *Coal Production* (annual). • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report* and *Coal Production* (annual). • 1981-1993—EIA, *Weekly Coal Production* and *Coal Production* (annual). • 1994—EIA, *Coal Industry Annual 1994* (December 1995), Tables 1, 3, and 9. • 1995—EIA estimates.

## Figure 7.3 Coal Consumption by Sector

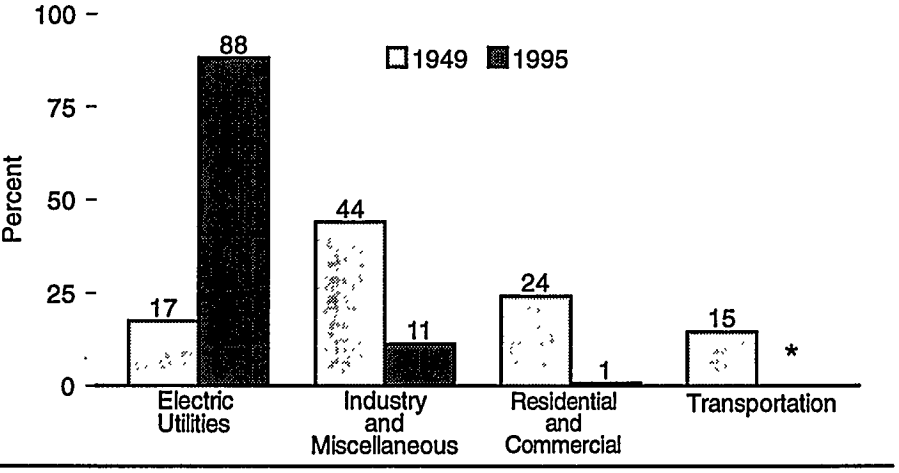
**By Sector, 1949-1995**




**By Sector, 1995**




**Shares by Sector, 1949 and 1995**




* Small amounts of coal for transportation use are included in Industry and Miscellaneous.

Source: Table 7.3.

# Table 7.3 Coal Consumption by Sector, 1949-1995

(Million Short Tons)

| Year | Residential and Commercial | Industry and Miscellaneous | | | Transportation | Electric Utilities | Total |
|---|---|---|---|---|---|---|---|
| | | Coke Plants | Other Industry and Miscellaneous | Total | | | |
| 1949 | 116.5 | 91.4 | 121.2 | 212.6 | 70.2 | 84.0 | 483.2 |
| 1950 | 114.6 | 104.0 | 120.6 | 224.6 | 63.0 | 91.9 | 494.1 |
| 1951 | 101.5 | 113.7 | 128.7 | 242.4 | 56.2 | 105.8 | 505.9 |
| 1952 | 92.3 | 97.8 | 117.1 | 214.9 | 39.8 | 107.1 | 454.1 |
| 1953 | 79.2 | 113.1 | 117.0 | 230.1 | 29.6 | 115.9 | 454.8 |
| 1954 | 69.1 | 85.6 | 98.2 | 183.9 | 18.6 | 118.4 | 389.9 |
| 1955 | 68.4 | 107.7 | 110.1 | 217.8 | 17.0 | 143.8 | 447.0 |
| 1956 | 64.2 | 106.3 | 114.3 | 220.6 | 13.8 | 158.3 | 456.9 |
| 1957 | 49.0 | 108.4 | 106.5 | 214.9 | 9.8 | 160.8 | 434.5 |
| 1958 | 47.9 | 76.8 | 100.5 | 177.4 | 4.7 | 155.7 | 385.7 |
| 1959 | 40.8 | 79.6 | 92.7 | 172.3 | 3.6 | 168.4 | 385.1 |
| 1960 | 40.9 | 81.4 | 96.0 | 177.4 | 3.0 | 176.7 | 398.1 |
| 1961 | 37.3 | 74.2 | 95.9 | 170.1 | 0.8 | 182.2 | 390.4 |
| 1962 | 36.5 | 74.7 | 97.1 | 171.7 | 0.7 | 193.3 | 402.3 |
| 1963 | 31.5 | 78.1 | 101.9 | 180.0 | 0.7 | 211.3 | 423.5 |
| 1964 | 27.2 | 89.2 | 103.1 | 192.4 | 0.7 | 225.4 | 445.7 |
| 1965 | 25.7 | 95.3 | 105.6 | 200.8 | 0.7 | 244.8 | 472.0 |
| 1966 | 25.6 | 96.4 | 108.7 | 205.1 | 0.6 | 266.5 | 497.7 |
| 1967 | 22.1 | 92.8 | 101.8 | 194.6 | 0.5 | 274.2 | 491.4 |
| 1968 | 20.0 | 91.3 | 100.4 | 191.6 | 0.4 | 297.8 | 509.8 |
| 1969 | 18.9 | 93.4 | 93.1 | 186.6 | 0.3 | 310.6 | 516.4 |
| 1970 | 16.1 | 96.5 | 90.2 | 186.6 | 0.3 | 320.2 | 523.2 |
| 1971 | 15.2 | 83.2 | 75.6 | 158.9 | 0.2 | 327.3 | 501.6 |
| 1972 | 11.7 | 87.7 | 72.9 | 160.6 | 0.2 | 351.8 | 524.3 |
| 1973 | 11.1 | 94.1 | 68.0 | 162.1 | 0.1 | 389.2 | 562.6 |
| 1974 | 11.4 | 90.2 | 64.9 | 155.1 | 0.1 | 391.8 | 558.4 |
| 1975 | 9.4 | 83.6 | 63.6 | 147.2 | (s) | 406.0 | 562.6 |
| 1976 | 8.9 | 84.7 | 61.8 | 146.5 | (s) | 448.4 | 603.8 |
| 1977 | 9.0 | 77.7 | 61.5 | 139.2 | (s) | 477.1 | 625.3 |
| 1978 | 9.5 | 71.4 | 63.1 | 134.5 | (1) | 481.2 | 625.2 |
| 1979 | 8.4 | 77.4 | 67.7 | 145.1 | (1) | 527.1 | 680.5 |
| 1980 | 6.5 | 66.7 | 60.3 | 127.0 | (1) | 569.3 | 702.7 |
| 1981 | 7.4 | 61.0 | 67.4 | 128.4 | (1) | 596.8 | 732.6 |
| 1982 | 8.2 | 40.9 | 64.1 | 105.0 | (1) | 593.7 | 706.9 |
| 1983 | 8.4 | 37.0 | 66.0 | 103.0 | (1) | 625.2 | 736.7 |
| 1984 | 9.1 | 44.0 | 73.7 | 117.8 | (1) | 664.4 | 791.3 |
| 1985 | 7.8 | 41.1 | 75.4 | 116.4 | (1) | 693.8 | 818.0 |
| 1986 | 7.7 | 35.9 | 75.6 | 111.5 | (1) | 685.1 | 804.2 |
| 1987 | 6.9 | 37.0 | 75.2 | 112.1 | (1) | 717.9 | 836.9 |
| 1988 | 7.1 | 41.9 | 76.3 | 118.1 | (1) | 758.4 | 883.6 |
| 1989 | 6.2 | 40.5 | 76.1 | 116.6 | (1) | 766.9 | 889.7 |
| 1990 | 6.7 | 38.9 | 76.3 | 115.2 | (1) | 773.5 | 895.5 |
| 1991 | 6.1 | 33.9 | 75.4 | 109.3 | (1) | 772.3 | 887.6 |
| 1992 | 6.2 | 32.4 | 74.0 | 106.4 | (1) | 779.9 | 892.4 |
| 1993 | 6.2 | 31.3 | 74.9 | 106.2 | (1) | 813.5 | 925.9 |
| 1994 | R6.0 | R31.7 | R75.2 | R106.9 | (1) | R817.3 | R930.2 |
| 1995 | 5.8 | 33.0 | 72.8 | 105.8 | (1) | 829.2 | 940.8 |

[1] After 1977, small amounts of coal consumed by Transportation Sector are included in "Other Industry and Miscellaneous."

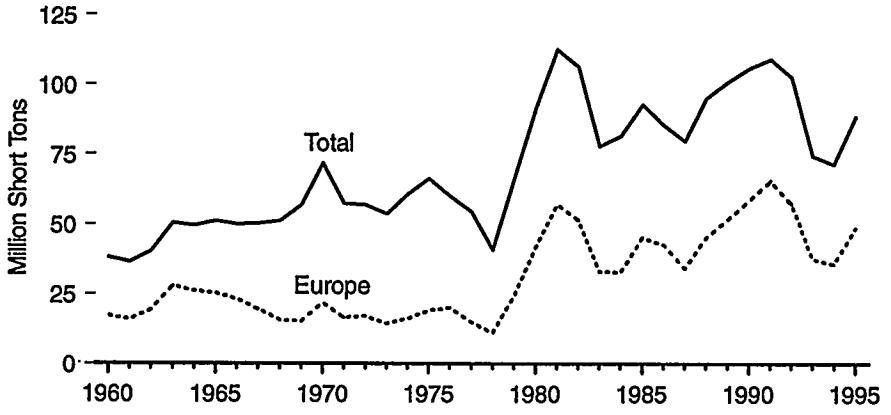
R=Revised data. (s)=Less than 0.05 million short tons.

Notes: • See Note 1 at end of section. • Data do not include consumption by nonutilities in SIC 49, "Electric Services." See Note 2 at end of section. • Totals may not equal sum of components due to independent rounding.

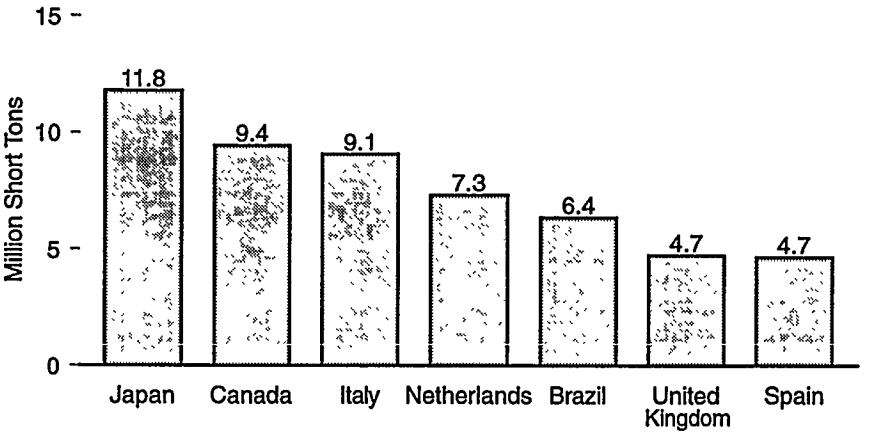
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. • 1981—EIA, *Weekly Coal Production*. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table 23. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table 23. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 45. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 45. 1986—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 45. • 1987-1994—EIA, *Quarterly Coal Report October-December 1995* (May 1996), Table 45. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 6.2.

# Figure 7.4 Coal Exports by Country of Destination

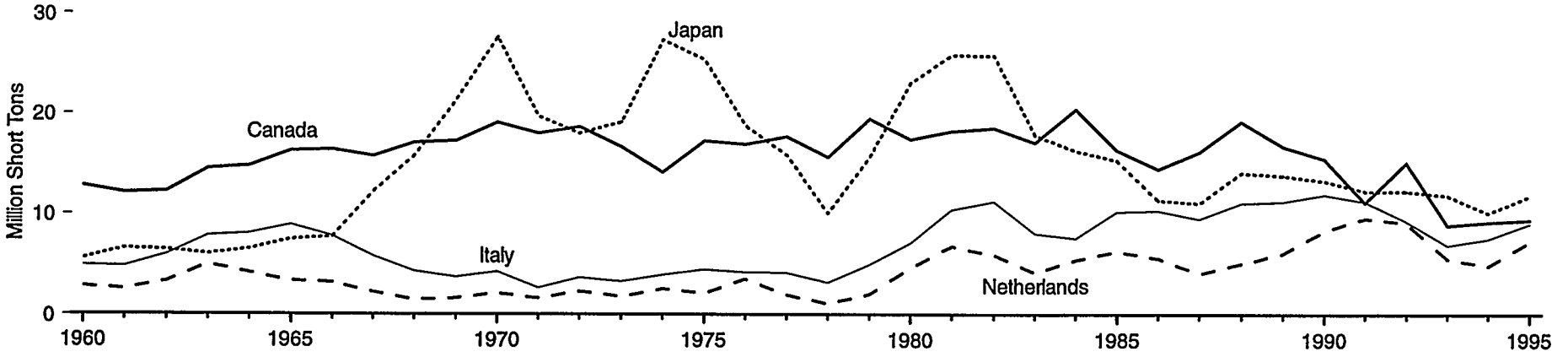
**Total and Europe, 1960-1995**




**By Selected Country, 1995**




**By Selected Country, 1960-1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.4.

# Table 7.4 Coal Exports by Country of Destination, 1960-1995

(Million Short Tons)

| Year | Canada | Brazil | Europe | | | | | | | | | | Japan | Other | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Belgium/ Luxembourg | Denmark | France | Germany [1] | Italy | Netherlands | Spain | United Kingdom | Other | Total | | | |
| 1960 | 12.8 | 1.1 | 1.1 | 0.1 | 0.8 | 4.6 | 4.9 | 2.8 | 0.3 | 0.0 | 2.4 | 17.1 | 5.6 | 1.3 | 38.0 |
| 1961 | 12.1 | 1.0 | 1.0 | 0.1 | 0.7 | 4.3 | 4.8 | 2.6 | 0.2 | 0.0 | 2.0 | 15.7 | 6.6 | 1.0 | 36.4 |
| 1962 | 12.3 | 1.3 | 1.3 | (s) | 0.9 | 5.1 | 6.0 | 3.3 | 0.8 | (s) | 1.8 | 19.1 | 6.5 | 1.0 | 40.2 |
| 1963 | 14.6 | 1.2 | 2.7 | (s) | 2.7 | 5.6 | 7.9 | 5.0 | 1.5 | 0.0 | 2.4 | 27.7 | 6.1 | 0.9 | 50.4 |
| 1964 | 14.8 | 1.1 | 2.3 | (s) | 2.2 | 5.2 | 8.1 | 4.2 | 1.4 | 0.0 | 2.6 | 26.0 | 6.5 | 1.1 | 49.5 |
| 1965 | 16.3 | 1.2 | 2.2 | (s) | 2.1 | 4.7 | 9.0 | 3.4 | 1.4 | (s) | 2.3 | 25.1 | 7.5 | 0.9 | 51.0 |
| 1966 | 16.5 | 1.7 | 1.8 | (s) | 1.6 | 4.9 | 7.8 | 3.2 | 1.2 | (s) | 2.5 | 23.1 | 7.8 | 1.0 | 50.1 |
| 1967 | 15.8 | 1.7 | 1.4 | 0.0 | 2.1 | 4.7 | 5.9 | 2.2 | 1.0 | 0.0 | 2.1 | 19.4 | 12.2 | 1.0 | 50.1 |
| 1968 | 17.1 | 1.8 | 1.1 | 0.0 | 1.5 | 3.8 | 4.3 | 1.5 | 1.5 | 0.0 | 1.9 | 15.5 | 15.8 | 0.9 | 51.2 |
| 1969 | 17.3 | 1.8 | 0.9 | 0.0 | 2.3 | 3.5 | 3.7 | 1.6 | 1.8 | 0.0 | 1.3 | 15.2 | 21.4 | 1.2 | 56.9 |
| 1970 | 19.1 | 2.0 | 1.9 | 0.0 | 3.6 | 5.0 | 4.3 | 2.1 | 3.2 | (s) | 1.8 | 21.8 | 27.6 | 1.2 | 71.7 |
| 1971 | 18.0 | 1.9 | 0.8 | 0.0 | 3.2 | 2.9 | 2.7 | 1.6 | 2.6 | 1.7 | 1.1 | 16.6 | 19.7 | 1.1 | 57.3 |
| 1972 | 18.7 | 1.9 | 1.1 | 0.0 | 1.7 | 2.4 | 3.7 | 2.3 | 2.1 | 2.4 | 1.1 | 16.9 | 18.0 | 1.2 | 56.7 |
| 1973 | 16.7 | 1.6 | 1.2 | 0.0 | 2.0 | 1.6 | 3.3 | 1.8 | 2.2 | 0.9 | 1.3 | 14.4 | 19.2 | 1.6 | 53.6 |
| 1974 | 14.2 | 1.3 | 1.1 | 0.0 | 2.7 | 1.5 | 3.9 | 2.6 | 2.0 | 1.4 | 0.9 | 16.1 | 27.3 | 1.8 | 60.7 |
| 1975 | 17.3 | 2.0 | 0.6 | 0.0 | 3.6 | 2.0 | 4.5 | 2.1 | 2.7 | 1.9 | 1.6 | 19.0 | 25.4 | 2.6 | 66.3 |
| 1976 | 16.9 | 2.2 | 2.2 | (s) | 3.5 | 1.0 | 4.2 | 3.5 | 2.5 | 0.8 | 2.1 | 19.9 | 18.8 | 2.1 | 60.0 |
| 1977 | 17.7 | 2.3 | 1.5 | 0.1 | 2.1 | 0.9 | 4.1 | 2.0 | 1.6 | 0.6 | 2.1 | 15.0 | 15.9 | 3.5 | 54.3 |
| 1978 | 15.7 | 1.5 | 1.1 | 0.0 | 1.7 | 0.6 | 3.2 | 1.1 | 0.8 | 0.4 | 2.2 | 11.0 | 10.1 | 2.5 | 40.7 |
| 1979 | 19.5 | 2.8 | 3.2 | 0.2 | 3.9 | 2.6 | 5.0 | 2.0 | 1.4 | 1.4 | 4.4 | 23.9 | 15.7 | 4.1 | 66.0 |
| 1980 | 17.5 | 3.3 | 4.6 | 1.7 | 7.8 | 2.5 | 7.1 | 4.7 | 3.4 | 4.1 | 6.0 | 41.9 | 23.1 | 6.0 | 91.7 |
| 1981 | 18.2 | 2.7 | 4.3 | 3.9 | 9.7 | 4.3 | 10.5 | 6.8 | 6.4 | 2.3 | 8.8 | 57.0 | 25.9 | 8.7 | 112.5 |
| 1982 | 18.6 | 3.1 | 4.8 | 2.8 | 9.0 | 2.3 | 11.3 | 5.9 | 5.6 | 2.0 | 7.6 | 51.3 | 25.8 | 7.5 | 106.3 |
| 1983 | 17.2 | 3.6 | 2.5 | 1.7 | 4.2 | 1.5 | 8.1 | 4.2 | 3.3 | 1.2 | 6.4 | 33.1 | 17.9 | 6.1 | 77.8 |
| 1984 | 20.4 | 4.7 | 3.9 | 0.6 | 3.8 | 0.9 | 7.6 | 5.5 | 2.3 | 2.9 | 5.3 | 32.8 | 16.3 | 7.2 | 81.5 |
| 1985 | 16.4 | 5.9 | 4.4 | 2.2 | 4.5 | 1.1 | 10.3 | 6.3 | 3.5 | 2.7 | 10.3 | 45.1 | 15.4 | 9.9 | 92.7 |
| 1986 | 14.5 | 5.7 | 4.4 | 2.1 | 5.4 | 0.8 | 10.4 | 5.6 | 2.6 | 2.9 | 8.4 | 42.6 | 11.4 | 11.4 | 85.5 |
| 1987 | 16.2 | 5.8 | 4.6 | 0.9 | 2.9 | 0.5 | 9.5 | 4.1 | 2.5 | 2.6 | 6.6 | 34.2 | 11.1 | 12.3 | 79.6 |
| 1988 | 19.2 | 5.3 | 6.5 | 2.8 | 4.3 | 0.7 | 11.1 | 5.1 | 2.5 | 3.7 | 8.5 | 45.1 | 14.1 | 11.3 | 95.0 |
| 1989 | 16.8 | 5.7 | 7.1 | 3.2 | 6.5 | 0.7 | 11.2 | 6.1 | 3.3 | 4.5 | 8.9 | 51.6 | 13.8 | 12.9 | 100.8 |
| 1990 | 15.5 | 5.8 | 8.5 | 3.2 | 6.9 | 1.1 | 11.9 | 8.4 | 3.8 | 5.2 | 9.5 | 58.4 | 13.3 | 12.7 | 105.8 |
| 1991 | 11.2 | 7.1 | 7.5 | 4.7 | 9.5 | 1.7 | 11.3 | 9.6 | 4.7 | 6.2 | 10.4 | 65.5 | 12.3 | 13.0 | 109.0 |
| 1992 | 15.1 | 6.4 | 7.2 | 3.8 | 8.1 | 1.0 | 9.3 | 9.1 | 4.5 | 5.6 | 8.5 | 57.3 | 12.3 | 11.4 | 102.5 |
| 1993 | 8.9 | 5.2 | 5.2 | 0.3 | 4.0 | 0.5 | 6.9 | 5.6 | 4.1 | 4.1 | 6.9 | 37.6 | 11.9 | 11.0 | 74.5 |
| 1994 | 9.2 | 5.5 | 4.9 | 0.5 | 2.9 | 0.3 | 7.5 | 4.9 | 4.1 | 3.4 | 7.3 | 35.8 | 10.2 | 10.7 | 71.4 |
| 1995 | 9.4 | 6.4 | 4.5 | 2.1 | 3.7 | 2.0 | 9.1 | 7.3 | 4.7 | 4.7 | 10.7 | 48.6 | 11.8 | 12.4 | 88.5 |

[1] Through 1990, the data for Germany are for the former West Germany only. Beginning with 1991, the data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.

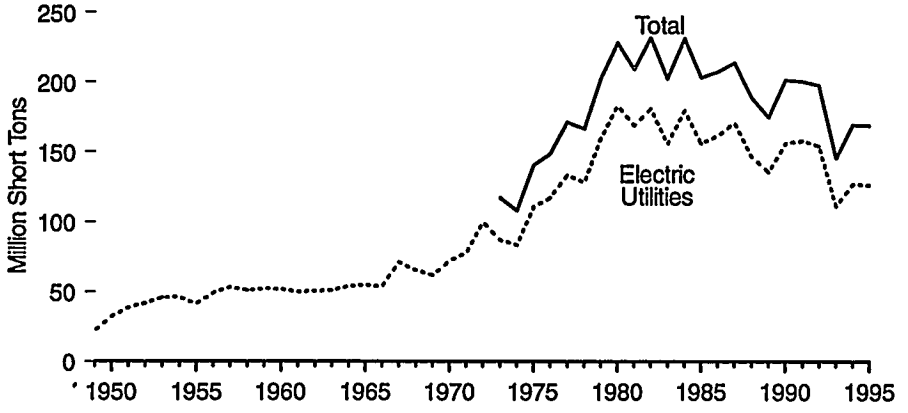
(s)=Less than 50,000 tons.

Note: Totals may not equal sum of components due to independent rounding.

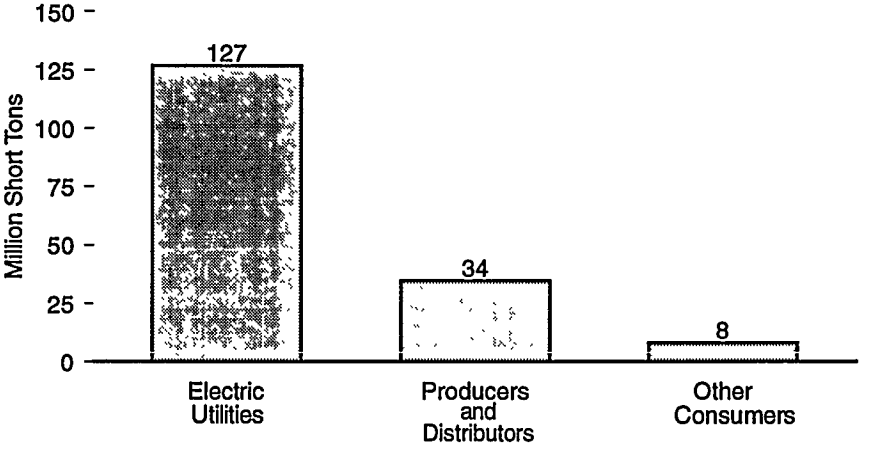
Sources: • 1960-1988—U.S. Department of Commerce, Bureau of the Census. *U.S. Exports by Schedule B Commodities, EM 522.* • 1989 forward—U.S. Department of Commerce, Bureau of the Census, "Monthly Report EM 545."

# Figure 7.5 Coal Stocks, End of Year

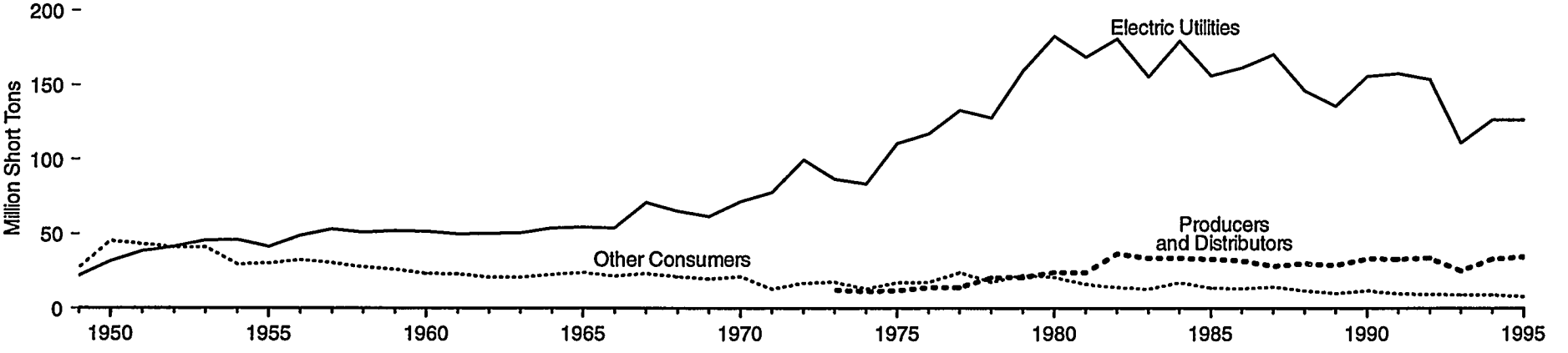
**Total and Electric Utility Stocks, 1949-1995**




**By Holding Entity, 1995**




**By Holding Entity, 1949-1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.5.

# Table 7.5 Coal Stocks, End of Year 1949-1995

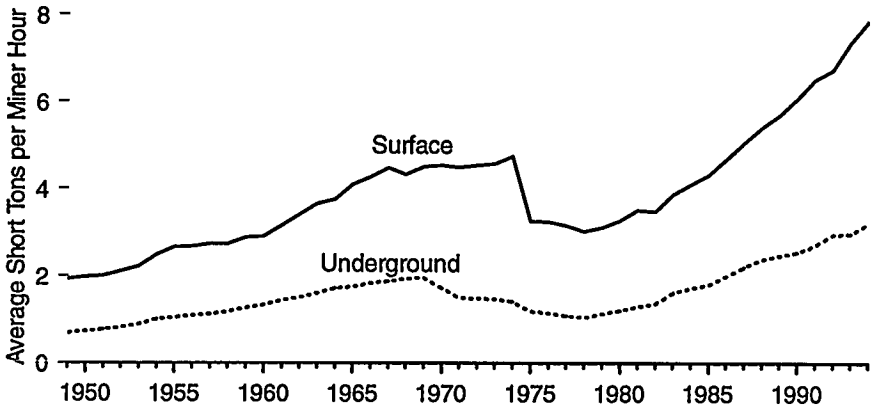
(Million Short Tons)

| Year | Consumer | | | | | Producers and Distributors | Total |
|---|---|---|---|---|---|---|---|
| | Residential [1] and Commercial | Coke Plants | Other Industry [2] | Electric Utilities | Total | | |
| 1949 | 1.4 | 10.0 | 16.1 | 22.1 | 49.5 | NA | NA |
| 1950 | 2.5 | 16.8 | 26.2 | 31.8 | 77.3 | NA | NA |
| 1951 | 1.8 | 15.3 | 26.2 | 38.5 | 81.8 | NA | NA |
| 1952 | 1.7 | 14.5 | 24.7 | 41.5 | 82.4 | NA | NA |
| 1953 | 1.5 | 16.6 | 22.8 | 45.6 | 86.6 | NA | NA |
| 1954 | 0.8 | 12.4 | 16.4 | 46.1 | 75.7 | NA | NA |
| 1955 | 1.0 | 13.4 | 15.9 | 41.4 | 71.7 | NA | NA |
| 1956 | 1.1 | 14.0 | 17.4 | 48.8 | 81.3 | NA | NA |
| 1957 | 0.9 | 14.2 | 15.5 | 53.1 | 83.7 | NA | NA |
| 1958 | 0.9 | 13.1 | 13.7 | 51.0 | 78.7 | NA | NA |
| 1959 | 1.0 | 11.6 | 13.6 | 52.1 | 78.4 | NA | NA |
| 1960 | 0.7 | 11.1 | 11.6 | 51.7 | 75.2 | NA | NA |
| 1961 | 0.5 | 10.5 | 11.9 | 50.1 | 73.0 | NA | NA |
| 1962 | 0.5 | 8.4 | 12.0 | 50.4 | 71.3 | NA | NA |
| 1963 | 0.5 | 8.1 | 12.3 | 50.6 | 71.5 | NA | NA |
| 1964 | 0.4 | 10.2 | 12.2 | 53.9 | 76.7 | NA | NA |
| 1965 | 0.4 | 10.6 | 13.1 | 54.5 | 78.6 | NA | NA |
| 1966 | 0.2 | 9.3 | 12.2 | 53.9 | 75.6 | NA | NA |
| 1967 | 0.2 | 11.1 | 12.3 | 71.0 | 94.6 | NA | NA |
| 1968 | 0.2 | 9.7 | 11.7 | 65.5 | 87.0 | NA | NA |
| 1969 | 0.2 | 9.1 | 10.8 | 61.9 | 81.9 | NA | NA |
| 1970 | 0.3 | 9.0 | 11.8 | 71.9 | 93.0 | NA | NA |
| 1971 | 0.3 | 7.3 | 5.6 | 77.8 | 91.0 | NA | NA |
| 1972 | 0.3 | 9.1 | 7.6 | 99.7 | 116.8 | NA | NA |
| 1973 | 0.3 | 7.0 | 10.4 | 87.0 | 104.6 | 12.5 | 117.2 |
| 1974 | 0.3 | 6.2 | 6.6 | 83.5 | 96.6 | 11.6 | 108.2 |
| 1975 | 0.2 | 8.8 | 8.5 | 110.7 | 128.3 | 12.1 | 140.4 |
| 1976 | 0.2 | 9.9 | 7.1 | 117.4 | 134.7 | 14.2 | 148.9 |
| 1977 | 0.2 | 12.8 | 11.1 | 133.2 | 157.3 | 14.2 | 171.5 |
| 1978 | 0.4 | 8.3 | 9.0 | 128.2 | 145.9 | 20.7 | 166.6 |
| 1979 | 0.3 | 10.2 | 11.8 | 159.7 | 182.0 | 20.8 | 202.8 |
| 1980 | NA | 9.1 | 12.0 | 183.0 | 204.0 | 24.4 | 228.4 |
| 1981 | NA | 6.5 | 9.9 | 168.9 | 185.3 | 24.1 | 209.4 |
| 1982 | NA | 4.6 | 9.5 | 181.1 | 195.3 | 36.8 | 232.0 |
| 1983 | NA | 4.3 | 8.7 | 155.6 | 168.7 | 33.9 | 202.6 |
| 1984 | NA | 6.2 | 11.3 | 179.7 | 197.2 | 34.1 | 231.3 |
| 1985 | NA | 3.4 | 10.4 | 156.4 | 170.2 | 33.1 | 203.4 |
| 1986 | NA | 3.0 | 10.4 | 161.8 | 175.2 | 32.1 | 207.3 |
| 1987 | NA | 3.9 | 10.8 | 170.8 | 185.5 | 28.3 | 213.8 |
| 1988 | NA | 3.1 | 8.8 | 146.5 | 158.4 | 30.4 | 188.8 |
| 1989 | NA | 2.9 | 7.4 | 135.9 | 146.1 | 29.0 | 175.1 |
| 1990 | NA | 3.3 | 8.7 | 156.2 | 168.2 | 33.4 | 201.6 |
| 1991 | NA | 2.8 | 7.1 | 157.9 | 167.7 | 33.0 | 200.7 |
| 1992 | NA | 2.6 | 7.0 | 154.1 | 163.7 | 34.0 | 197.7 |
| 1993 | NA | 2.4 | 6.7 | 111.3 | 120.5 | 25.3 | 145.7 |
| 1994 | NA | R2.7 | R6.6 | R126.9 | R136.1 | R33.2 | R169.4 |
| 1995 | NA | 2.6 | 5.6 | 126.6 | 134.8 | 34.4 | 169.2 |

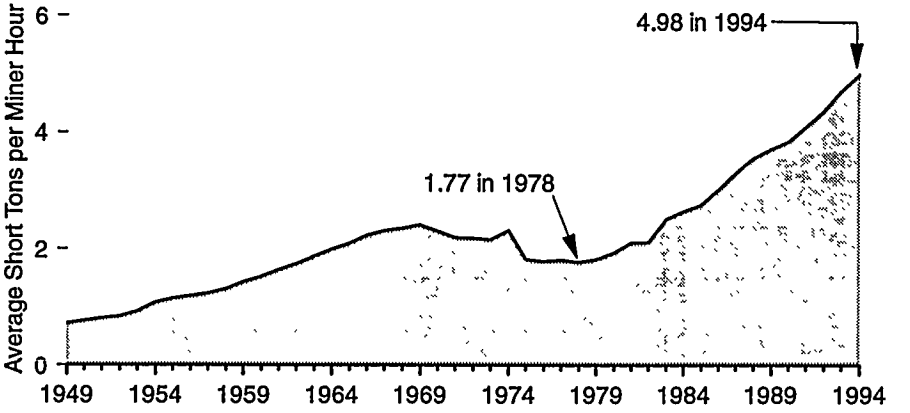
[1] Stocks at retail dealers, excluding anthracite.
[2] Includes transportation sector.
R=Revised data. NA=Not available.
Note: Totals may not equal sum of components due to independent rounding.
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976*. • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978*, and *Weekly Coal Report*. • 1979 and 1980—EIA, Energy Data Report, *Weekly Coal Report*. • 1981—EIA, *Weekly Coal Production*. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table 31. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table 31. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 52. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 52. 1986—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 52. • 1987-1994—EIA, *Quarterly Coal Report October-December 1995* (May 1996), Table 52. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 6.3.

## Figure 7.6 Coal Mining Productivity, 1949-1994

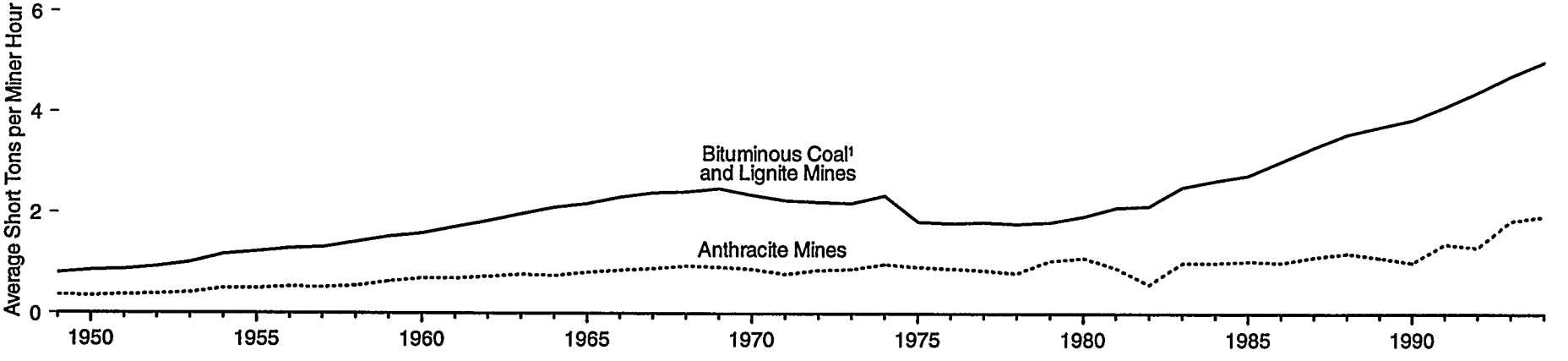
**Bituminous Coal[1] and Lignite Mines, by Type**




**All Mines, Average**




**All Mines, by Coal Type**




[1] Includes subbituminous coal.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.6.

# Table 7.6 Coal Mining Productivity, 1949-1994

(Short Tons per Miner Hour [1])

| Year | Bituminous Coal [2] and Lignite Mines | | | Anthracite Mines | All Mines |
|---|---|---|---|---|---|
| | Underground | Surface | Average | | |
| 1949 | 0.68 | 1.92 | 0.80 | 0.36 | 0.72 |
| 1950 | 0.72 | 1.96 | 0.85 | 0.35 | 0.76 |
| 1951 | 0.76 | 2.00 | 0.88 | 0.37 | 0.80 |
| 1952 | 0.80 | 2.10 | 0.93 | 0.38 | 0.84 |
| 1953 | 0.88 | 2.22 | 1.02 | 0.41 | 0.93 |
| 1954 | 1.00 | 2.48 | 1.18 | 0.50 | 1.08 |
| 1955 | 1.04 | 2.65 | 1.23 | 0.50 | 1.14 |
| 1956 | 1.08 | 2.67 | 1.29 | 0.53 | 1.19 |
| 1957 | 1.11 | 2.73 | 1.32 | 0.52 | 1.23 |
| 1958 | 1.17 | 2.73 | 1.42 | 0.55 | 1.31 |
| 1959 | 1.26 | 2.87 | 1.53 | 0.64 | 1.43 |
| 1960 | 1.33 | 2.91 | 1.60 | 0.70 | 1.52 |
| 1961 | 1.43 | 3.16 | 1.73 | 0.70 | 1.64 |
| 1962 | 1.50 | 3.40 | 1.84 | 0.74 | 1.74 |
| 1963 | 1.60 | 3.66 | 1.98 | 0.78 | 1.87 |
| 1964 | 1.72 | 3.76 | 2.11 | 0.76 | 1.99 |
| 1965 | 1.75 | 4.10 | 2.19 | 0.82 | 2.09 |
| 1966 | 1.83 | 4.28 | 2.32 | 0.86 | 2.23 |
| 1967 | 1.88 | 4.48 | 2.40 | 0.90 | 2.31 |
| 1968 | 1.93 | 4.33 | 2.42 | 0.95 | 2.35 |
| 1969 | 1.95 | 4.50 | 2.49 | 0.93 | 2.41 |
| 1970 | 1.72 | 4.53 | 2.36 | 0.89 | 2.30 |
| 1971 | 1.50 | 4.49 | 2.25 | 0.79 | 2.19 |
| 1972 | 1.49 | 4.54 | 2.22 | 0.86 | 2.18 |
| 1973 | 1.46 | 4.58 | 2.20 | 0.89 | 2.16 |
| 1974 | 1.41 | 4.74 | 2.35 | 0.98 | 2.31 |
| 1975 | 1.19 | 3.26 | 1.83 | 0.93 | 1.81 |
| 1976 | 1.14 | 3.25 | 1.80 | 0.90 | 1.78 |
| 1977 | 1.09 | 3.16 | 1.82 | 0.87 | 1.80 |
| 1978 | 1.04 | 3.03 | 1.79 | 0.81 | 1.77 |
| 1979 | 1.13 | 3.12 | 1.82 | 1.06 | 1.81 |
| 1980 | 1.21 | 3.27 | 1.94 | 1.11 | 1.93 |
| 1981 | 1.29 | 3.50 | 2.11 | 0.92 | 2.10 |
| 1982 | 1.37 | 3.48 | 2.14 | 0.59 | 2.11 |
| 1983 | 1.62 | 3.87 | 2.52 | 1.01 | 2.50 |
| 1984 | 1.72 | 4.10 | 2.65 | 1.02 | 2.64 |
| 1985 | 1.79 | 4.32 | 2.76 | 1.05 | 2.74 |
| 1986 | 2.00 | 4.69 | 3.04 | 1.03 | 3.01 |
| 1987 | 2.21 | 5.06 | 3.32 | 1.13 | 3.30 |
| 1988 | 2.38 | 5.41 | 3.58 | 1.21 | 3.55 |
| 1989 | 2.46 | 5.70 | 3.73 | 1.12 | 3.70 |
| 1990 | 2.54 | 6.07 | 3.86 | 1.03 | 3.83 |
| 1991 | 2.70 | 6.51 | 4.12 | 1.39 | 4.09 |
| 1992 | 2.95 | 6.73 | 4.41 | 1.33 | 4.36 |
| 1993 | 2.97 | 7.36 | 4.74 | 1.86 | 4.70 |
| 1994 | 3.20 | 7.82 | 5.02 | 1.94 | 4.98 |

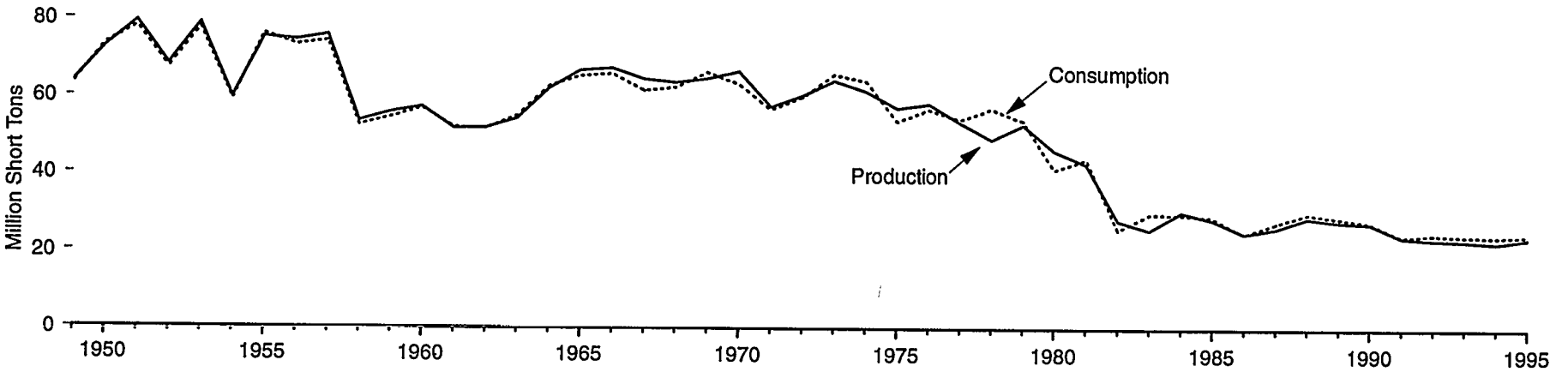
[1] Data for bituminous coal and lignite mines 1949-1973 and anthracite mines 1949-1978 were originally reported in short tons per miner-day. The data were converted to short-tons per miner-hour by assuming an eight-hour day. All remaining data were calculated by dividing total production by total labor hours worked by all mine employees except office workers.

[2] Includes subbituminous coal.

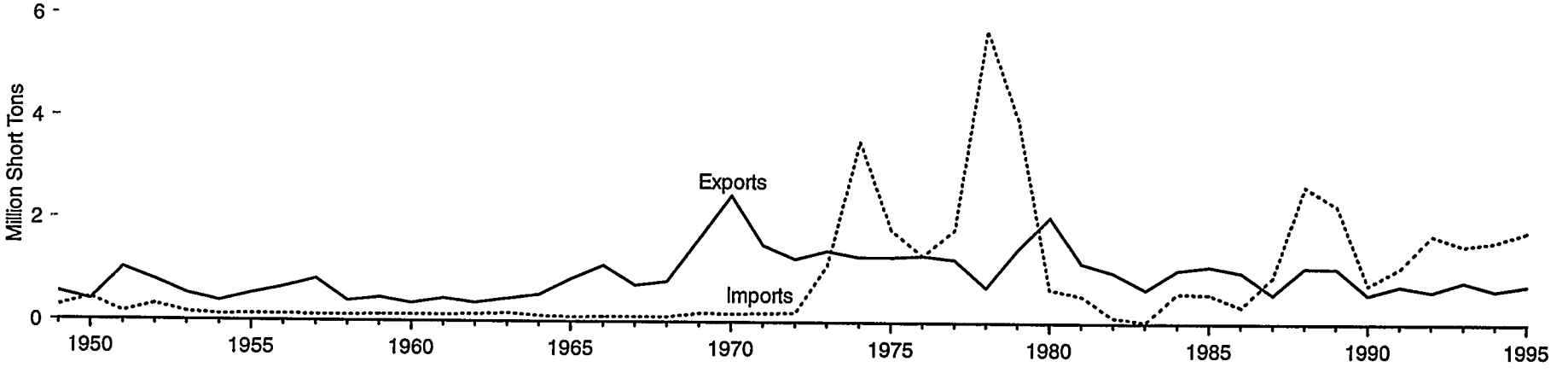
Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" and "Coal-Pennsylvania Anthracite" chapters. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976* and *Coal-Pennsylvania Anthracite 1976.* • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978* and *Coal-Pennsylvania Anthracite 1977; 1978.* • 1979—EIA, Energy Data Report, *Coal Production-1979.* • 1980-1992—EIA, *Coal Production* (annual). • 1993—EIA, *Coal Industry Annual 1993* (December 1994). • 1994—EIA, *Coal Industry Annual 1994* (October 1995).

# Figure 7.7 Coke Overview, 1949-1995

**Production and Consumption**




**Imports and Exports**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 7.7.

# Table 7.7 Coke Overview, 1949-1995

(Million Short Tons)

| Year | Production | Imports | Exports | Stock Change [1] | Consumption [2] |
|---|---|---|---|---|---|
| 1949 | 63.64 | 0.28 | 0.55 | -0.18 | 63.19 |
| 1950 | 72.72 | 0.44 | 0.40 | 0.66 | 73.42 |
| 1951 | 79.33 | 0.16 | 1.03 | -0.37 | 78.09 |
| 1952 | 68.25 | 0.31 | 0.79 | -0.42 | 67.36 |
| 1953 | 78.84 | 0.16 | 0.52 | -0.78 | 77.70 |
| 1954 | 59.66 | 0.12 | 0.39 | -0.27 | 59.12 |
| 1955 | 75.30 | 0.13 | 0.53 | 1.25 | 76.15 |
| 1956 | 74.48 | 0.13 | 0.66 | -0.63 | 73.32 |
| 1957 | 75.95 | 0.12 | 0.82 | -0.81 | 74.43 |
| 1958 | 53.60 | 0.12 | 0.39 | -0.68 | 52.66 |
| 1959 | 55.86 | 0.12 | 0.46 | -0.86 | 54.67 |
| 1960 | 57.23 | 0.13 | 0.35 | -0.06 | 56.95 |
| 1961 | 51.71 | 0.13 | 0.45 | 0.70 | 52.09 |
| 1962 | 51.91 | 0.14 | 0.36 | 0.14 | 51.82 |
| 1963 | 54.28 | 0.15 | 0.45 | 1.02 | 55.00 |
| 1964 | 62.15 | 0.10 | 0.52 | 0.91 | 62.64 |
| 1965 | 66.85 | 0.09 | 0.83 | -0.73 | 65.38 |
| 1966 | 67.40 | 0.10 | 1.10 | -0.38 | 66.02 |
| 1967 | 64.58 | 0.09 | 0.71 | -2.39 | 61.57 |
| 1968 | 63.65 | 0.09 | 0.79 | -0.52 | 62.44 |
| 1969 | 64.76 | 0.17 | 1.63 | 2.87 | 66.17 |
| 1970 | 66.53 | 0.15 | 2.48 | -0.99 | 63.21 |
| 1971 | 57.44 | 0.17 | 1.51 | 0.59 | 56.69 |
| 1972 | 60.51 | 0.19 | 1.23 | 0.59 | 60.05 |
| 1973 | 64.33 | 1.09 | 1.40 | 1.74 | 65.77 |
| 1974 | 61.58 | 3.54 | 1.28 | 0.25 | 64.09 |
| 1975 | 57.21 | 1.82 | 1.27 | -4.06 | 53.69 |
| 1976 | 58.33 | 1.31 | 1.32 | -1.50 | 56.83 |
| 1977 | 53.51 | 1.83 | 1.24 | 0.05 | 54.14 |
| 1978 | 49.01 | 5.72 | 0.69 | 2.91 | 56.95 |
| 1979 | 52.94 | 3.97 | 1.44 | -1.65 | 53.83 |
| 1980 | 46.13 | 0.66 | 2.07 | -3.44 | 41.28 |
| 1981 | 42.79 | 0.53 | 1.17 | 1.90 | 44.05 |
| 1982 | 28.12 | 0.12 | 0.99 | -1.47 | 25.78 |
| 1983 | 25.81 | 0.04 | 0.67 | 4.67 | 29.85 |
| 1984 | 30.40 | 0.58 | 1.05 | -0.20 | 29.74 |
| 1985 | 28.44 | 0.58 | 1.12 | 1.16 | 29.06 |
| 1986 | 24.92 | 0.33 | 1.00 | 0.49 | 24.73 |
| 1987 | 26.30 | 0.92 | 0.57 | 1.00 | 27.65 |
| 1988 | 28.95 | 2.69 | 1.09 | -0.52 | 30.02 |
| 1989 | 28.05 | 2.31 | 1.09 | -0.34 | 28.93 |
| 1990 | 27.62 | 0.77 | 0.57 | (s) | 27.81 |
| 1991 | 24.05 | 1.10 | 0.74 | -0.19 | 24.22 |
| 1992 | 23.41 | 1.74 | 0.64 | 0.22 | 24.73 |
| 1993 | 23.18 | 1.53 | 0.84 | 0.42 | 24.30 |
| 1994 | E22.69 | 1.61 | 0.66 | E0.53 | R24.16 |
| 1995 | 23.75 | 1.82 | 0.75 | -0.37 | 24.45 |

[1] Producer and distributor stocks at end of year. Negative numbers denote a net addition to stocks or a reduction in supply. Positive numbers denote a net withdrawal from stocks or an addition to supply.

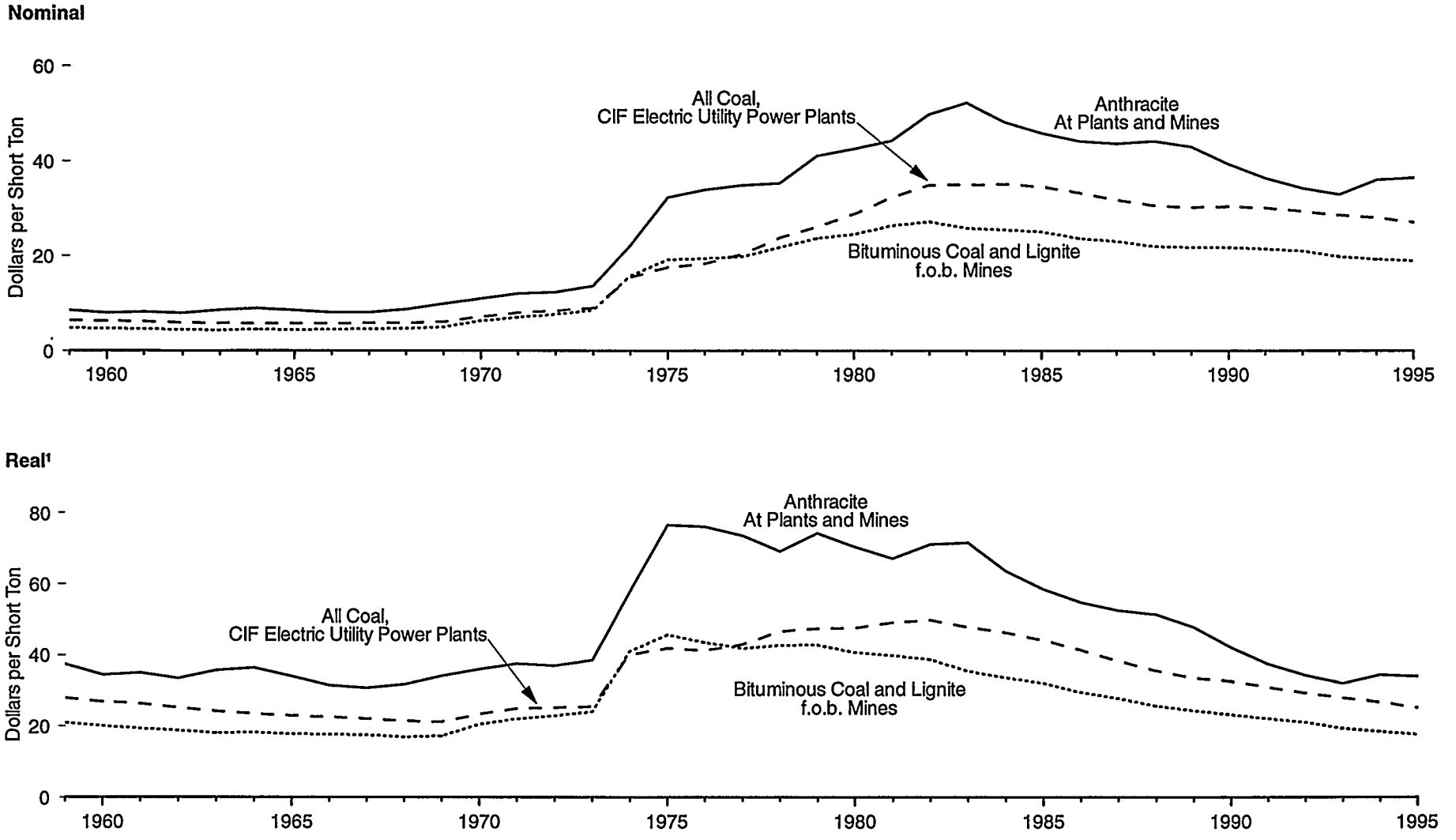
[2] Consumption is the sum of production, imports, and stock change minus exports.

R=Revised data. E=Estimate. (s)=Less than 0.005 million short tons .

Note: Totals may not equal sum of components due to independent rounding.

Sources: • 1949-1975—Bureau of Mines, *Minerals Yearbook*, "Coke and Coal Chemicals" chapter. • 1976-1980—Energy Information Administration (EIA), Energy Data Report, *Coke and Coal Chemicals*, annual. • 1981—EIA, Energy Data Report, *Coke Plant Report*, quarterly. • 1982—EIA, *Quarterly Coal Report October-December 1990* (May 1991), Table A1. • 1983—EIA, *Quarterly Coal Report October-December 1991* (May 1992), Table A1. • 1984—EIA, *Quarterly Coal Report October-December 1992* (May 1993), Table 2. • 1985—EIA, *Quarterly Coal Report October-December 1993* (May 1994), Table 2. • 1986—EIA, *Quarterly Coal Report October-December 1994* (May 1995), Table 2.1987 forward—EIA, *Quarterly Coal Report October-December 1995* (May 1996), Table 2.

## Figure 7.8 Coal Prices, 1959-1995




[1] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

Notes: • Bituminous coal includes subbituminous coal. • CIF=Cost, Insurance, and Freight. • f.o.b.=Free on board. See Glossary. • Because vertical scales differ, graphs should not be compared.

Source: Table 7.8.

# Table 7.8 Coal Prices, 1949-1995

(Dollars per Short Ton)

| Year | Bituminous Coal [1] and Lignite | | Anthracite | | All Coal | |
|---|---|---|---|---|---|---|
| | F.O.B. [2] Mines | | At Plants and Mines [3] | | CIF [4] Electric Utility Power Plants | |
| | Nominal | Real [5] | Nominal | Real [5] | Nominal | Real [5] |
| 1949 | 4.88 | ([6]) | 8.90 | ([6]) | NA | NA |
| 1950 | 4.84 | ([6]) | 9.34 | ([6]) | NA | NA |
| 1951 | 4.92 | ([6]) | 9.94 | ([6]) | NA | NA |
| 1952 | 4.90 | ([6]) | 9.58 | ([6]) | 6.61 | ([6]) |
| 1953 | 4.92 | ([6]) | 9.87 | ([6]) | 6.61 | ([6]) |
| 1954 | 4.52 | ([6]) | 8.76 | ([6]) | 6.31 | ([6]) |
| 1955 | 4.50 | ([6]) | 8.00 | ([6]) | 6.07 | ([6]) |
| 1956 | 4.82 | ([6]) | 8.33 | ([6]) | 6.32 | ([6]) |
| 1957 | 5.08 | ([6]) | 9.11 | ([6]) | 6.64 | ([6]) |
| 1958 | 4.86 | ([6]) | 9.14 | ([6]) | 6.58 | ([6]) |
| 1959 | 4.77 | R20.83 | 8.55 | R37.34 | 6.37 | R27.82 |
| 1960 | 4.69 | R20.13 | 8.01 | R34.38 | 6.26 | R26.87 |
| 1961 | 4.58 | R19.41 | 8.26 | R35.00 | 6.20 | R26.27 |
| 1962 | 4.48 | R18.74 | 7.99 | R33.43 | 6.02 | R25.19 |
| 1963 | 4.39 | R18.14 | 8.64 | R35.70 | 5.86 | R24.21 |
| 1964 | 4.45 | R18.16 | 8.93 | R36.45 | 5.74 | R23.43 |
| 1965 | 4.44 | R17.76 | 8.51 | R34.04 | 5.71 | R22.84 |
| 1966 | 4.54 | R17.67 | 8.08 | R31.44 | 5.76 | R22.41 |
| 1967 | 4.62 | R17.43 | 8.15 | R30.75 | 5.85 | R22.08 |
| 1968 | 4.67 | R16.86 | 8.78 | R31.70 | 5.93 | R21.41 |
| 1969 | 4.99 | R17.21 | 9.91 | R34.17 | 6.13 | R21.14 |
| 1970 | 6.26 | R20.46 | 11.03 | R36.05 | 7.13 | R23.30 |
| 1971 | 7.07 | R21.96 | 12.08 | R37.52 | 8.00 | R24.84 |
| 1972 | 7.66 | R22.87 | 12.40 | R37.01 | 8.44 | R25.19 |
| 1973 | 8.53 | R24.10 | 13.65 | R38.56 | 9.01 | R25.45 |
| 1974 | 15.75 | R40.91 | 22.19 | R57.64 | 15.46 | R40.16 |
| 1975 | 19.23 | R45.57 | 32.26 | R76.45 | 17.63 | R41.78 |
| 1976 | 19.43 | R43.57 | 33.92 | R76.05 | 18.38 | R41.21 |
| 1977 | 19.82 | R41.81 | 34.86 | R73.54 | 20.37 | R42.97 |
| 1978 | 21.78 | R42.71 | 35.25 | R69.12 | 23.75 | R46.57 |
| 1979 | 23.65 | R42.77 | 41.06 | R74.25 | 26.15 | R47.29 |
| 1980 | 24.52 | R40.60 | 42.51 | R70.38 | 28.76 | R47.62 |
| 1981 | 26.29 | R39.89 | 44.28 | R67.19 | 32.32 | R49.04 |
| 1982 | 27.14 | R38.72 | 49.85 | R71.11 | 34.91 | R49.80 |
| 1983 | 25.85 | R35.36 | 52.29 | R71.53 | 34.99 | R47.87 |
| 1984 | 25.51 | R33.61 | 48.22 | R63.53 | 35.12 | R46.27 |
| 1985 | 25.10 | R32.02 | 45.80 | R58.42 | 34.53 | R44.04 |
| 1986 | 23.70 | R29.40 | 44.12 | R54.74 | 33.30 | R41.32 |
| 1987 | 23.00 | R27.68 | 43.65 | R52.53 | 31.83 | R38.30 |
| 1988 | 22.00 | R25.55 | 44.16 | R51.29 | 30.64 | R35.59 |
| 1989 | 21.76 | R24.26 | 42.93 | R47.86 | 30.15 | R33.61 |
| 1990 | 21.71 | R23.19 | 39.40 | R42.09 | 30.45 | R32.53 |
| 1991 | 21.45 | R22.05 | 36.34 | R37.35 | 30.02 | R30.85 |
| 1992 | 20.98 | R20.98 | 34.24 | R34.24 | 29.36 | R29.36 |
| 1993 | 19.79 | R19.29 | 32.90 | R32.07 | 28.58 | R27.86 |
| 1994 | R19.35 | R18.43 | R36.07 | R34.35 | R28.03 | R26.70 |
| 1995E | 19.00 | 17.67 | 36.50 | 33.95 | 27.09 | 25.20 |

[1] Includes subbituminous coal.
[2] Free on board (see Glossary).
[3] For 1949-1978, prices are f.o.b. preparation plants. For 1979 forward, prices are f.o.b. mines.
[4] Cost, Insurance, and Freight (see Glossary).
[5] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.
[6] For 1949-1958, the gross domestic product implicit price deflators, which are used to convert nominal dollars to real (inflation-adjusted) values, were not available in time to use in this report.

R=Revised data. E=Estimate. NA=Not available.

Sources: **Bituminous Coal and Lignite, F.O.B. Mines:** • 1949-1975—Bureau of Mines, *Minerals Yearbook,* "Coal-Bituminous and Lignite" chapter. • 1976—Energy Information Administration (EIA), Energy Data Report, *Coal-Bituminous and Lignite in 1976.* • 1977 and 1978—EIA, Energy Data Report, *Bituminous Coal and Lignite Production and Mine Operations-1977; 1978.* • 1979-1992—EIA, *Coal Production,* (annual). • 1993—EIA, *Coal Industry Annual 1993* (December 1994). • 1994—EIA, *Coal Industry Annual 1994* (December 1995). • 1995—EIA estimates. **Anthracite:** • 1949-1976—Bureau of Mines, *Minerals Yearbook,* "Coal-Pennsylvania Anthracite" chapter. • 1977 and 1978—EIA, Energy Data Report, *Coal-Pennsylvania Anthracite 1977; 1978.* • 1979—EIA, Energy Data Report, *Coal Production-1979.* • 1980-1993—EIA, *Coal Production,* (annual). • 1994—EIA, *Coal Industry Annual 1994* (December 1995). • 1995—EIA estimates. **All Coal, CIF Electric Utility Power Plants:** • 1949-1972—National Coal Association, *Steam Electric Plant Factors.* • 1973-1982—Federal Power Commission, Form FPC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants." • 1983 forward—Federal Energy Regulatory Commission, Form FERC-423, "Monthly Report of Cost and Quality of Fuel for Electric Utilities."

## Coal Notes

1. Data in this report on the consumption of bituminous coal (including subbituminous coal), lignite, and anthracite are generated primarily from consumption data reported in surveys. Included are data reported by all electric utility companies and coke plant companies. Data on coal consumption by all industrial and manufacturing establishments and by the residential and commercial sector are based on distribution data obtained quarterly from coal companies. Included in each sector's data are the following: Electric Utility Sector–consumption by privately and publicly owned establishments engaged in the generation and/or distribution of electric power primarily for sale or resale; Industrial and Miscellaneous Sector–consumption at manufacturing plants, large commercial establishments, coking plants, and by agriculture, mining (other than coal mining), and construction industries; Transportation Sector–sales to railroads and vessel bunker fuel; Residential and Commercial Sector–retail dealer sales to households and small commercial establishments.

2. Consumption data for 1995 exclude Energy Information Administration estimates of 4 million short tons per quarter that are consumed by independent power producers to generate electricity and by cogeneration plants not included in the other industrial, coke, and commercial sectors. Those estimates, in thousand short tons, are as follows: 1989, 219; 1990, 400; 1991, 1,500; 1992, 2,500; 1993, 3,086; and 1994, 3,785.

# 8. Electricity

## The Electric Power Industry

Electric utilities are the primary source of electricity in the United States; however, after the Public Utility Regulatory Policies Act of 1978 was passed, nonutility power producers supplied an ever-increasing amount of electricity. Nonutility power producers own electric generating capacity but, unlike electric utilities, lack a designated service area. Cogenerators, small power producers, and independent power producers are all classified as nonutility power producers. In 1994, electric utilities purchased 209 billion kilowatthours of nonutility electricity generation (8.1).* By comparison, electric utilities' net generation in 1994 totaled 2,911 billion kilowatthours.

## Net Summer Capability

Net summer capability, a common measure of generating capacity, is defined as the steady hourly output that generating equipment is expected to supply to the system load, exclusive of auxiliary power, as demonstrated by testing at the time of summer peak demand. Although data on net summer capability at electric utilities have been collected only since 1985, the Energy Information Administration has estimated values for prior years (8.8). Estimates and collected data indicate that net summer capability during the 1949-to-1995 period increased at an average annual rate of 5.4 percent, reaching 705 million kilowatts.

At electric utilities, conventional steam plants fueled by fossil fuels, wood, and waste were responsible for most of the growth. In 1995, they accounted for close to two-thirds of electric utility total net summer capability. Nuclear-powered plants accounted for 14 percent of the total in 1995. Conventional and pumped storage hydroelectric facilities also accounted for 14 percent. Internal combustion and gas turbine plants, as well as plants powered by emerging sources of energy, such as geothermal, accounted for the remainder.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

At nonutility power producers, net summer capability in 1994 increased 12 percent from the 1993 level to 62 million kilowatts, 8.1 percent of the electric power industry total (8.2).

## Electricity Generation

Net generation of electricity by electric utilities in 1995 totaled 3.0 trillion kilowatthours, up 2.9 percent from the 1994 level (8.3). Coal continued to fuel most of the generation and accounted for 1.7 trillion kilowatthours. Natural gas accounted for 307 billion kilowatthours. Despite continuing low petroleum prices, petroleum-fired generation in 1995 fell to 61 billion kilowatthours. In contrast, nuclear-based generation rose 5.2 percent to 673 billion kilowatthours, an all-time high. Conventional hydroelectric generation totaled 296 billion kilowatthours, up 20 percent from generation in 1994. Hydroelectric pumped storage generation, however, was a negative 3 billion kilowatthours, because the energy used for pumping exceeded energy generated. Geothermal and other renewable energy sources accounted for 6 billion kilowatthours.

Nonutilities' gross generation totaled 355 billion kilowatthours in 1994, up 9.1 percent from the 1993 level (8.12). Over half of that total was sold to electric utilities (8.1 and 8.12). In 1994, by far the largest share of nonutility power gross generation came from manufacturers (8.13). The transportation, public utilities, and mining industries also generated significant amounts of electric power. The West South Central and Pacific Census Divisions led the Nation in nonutility power gross generation.

## Energy Consumption

During the 1949-to-1995 period, consumption of coal at electric utilities grew at a faster rate than did consumption of natural gas and petroleum (8.5). On a Btu basis, coal accounted for 67 percent of total fossil fuel consumption in 1949 and 81 percent of the total in 1995. Seventeen quadrillion Btu of coal were consumed by electric utilities in 1995.

Electric utility consumption of both petroleum and natural gas increased during much of the period, but growth in the use of both fuels began to slow during the 1970's. During the first half of the 1980's, consumption actually decreased.

Changes in the consumption of petroleum and natural gas at electric utilities from 1986 through 1988 illustrated the utilities' fuel-switching capabilities and their use of them to respond to fluctuations in fuel prices. After 1988, however, electric utility consumption of petroleum fell from 1.7 quadrillion Btu in 1989 to 0.7 quadrillion Btu in 1995. Electric utility consumption of clean-burning natural gas, on the other hand, remained near the 1988 level for 4 years and then increased in 1994 and again in 1995 to 3.3 quadrillion Btu, as electric utilities sought to comply with environmental regulations.

But whereas electric utilities rely most heavily on coal as an energy input, 51 percent of the nonutilities' 1994 gross generation came from natural gas and 24 percent came from renewable energy sources (8.12).

## Sales of Electricity to Consumers

During the 1949-to-1995 period, electricity sales increased at an average annual rate of 5.5 percent (8.6). Annual sales declined only two times, in 1974 and 1982. In 1974, the decline in sales spanned all sectors, whereas in 1982, lower sales to the industrial sector alone accounted for the decline.

Historically (from 1949 through 1990), sales of electricity to the industrial sector exceeded sales to other sectors. In 1991, 1993, and 1995, however, sales to the residential sector accounted for the largest share. In 1995, sales to the residential sector rose 3.5 percent to the record level of 1,043 billion kilowatthours, while sales to the industrial sector rose 0.3 percent to 1,011 billion kilowatthours. Sales to the commercial sector of 853 billion kilowatthours were 4.0 percent above the 1994 level.

## Retail Prices of Electricity

The weighted average real price[1] of electricity to all sectors in 1995 was 6.4 cents per kilowatthour, 17 percent below the price in 1960 (8.11). However, the apparent stability in electricity prices masked fluctuations that occurred throughout the period and variations in prices paid by consumers in different end-use sectors. And, because conversion losses account for roughly two-thirds of the energy input for electricity generation, electricity remained by far the most expensive source of energy on a Btu basis. The average real price of electricity sold to the residential sector, where prices have usually been the highest, was 7.8 cents per kilowatthour in 1995, down 2.5 percent from the price in 1994. The commercial sector price of 7.2 cents per kilowatthour in 1995 was down 1.4 percent. Industrial customers continued to pay prices that compared favorably with prices in other sectors. In 1995, the real price of electricity sold to industrial users was 4.4 cents per kilowatthour, down 4.3 percent from the price in 1994.

[1]Real (inflation-adjusted) prices are expressed in chained (1992) dollars.

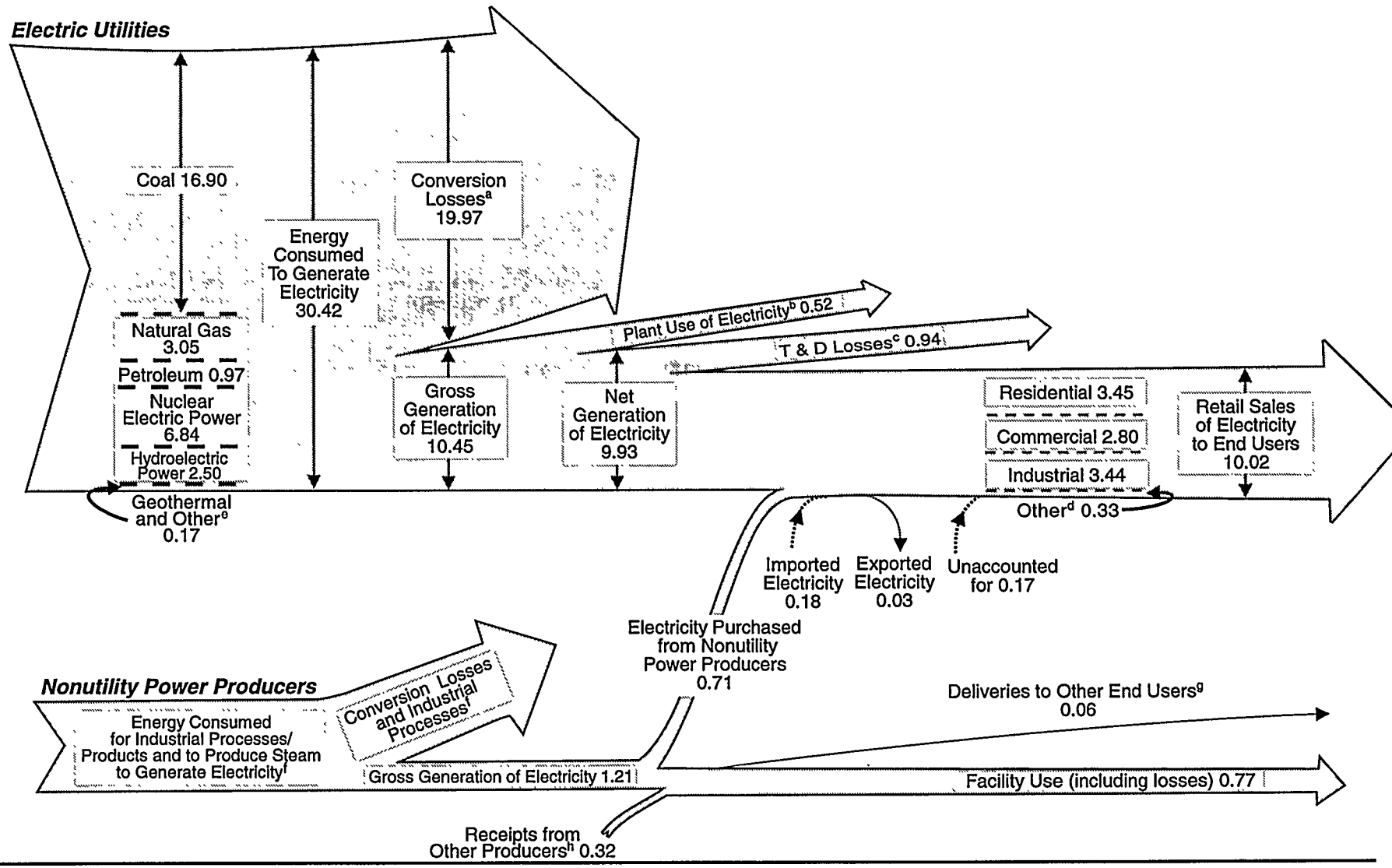
### Demand-Side Management at Electric Utilities

The planning, implementation, and monitoring of electric utility activities designed to encourage customers to modify their patterns of electricity usage, including the timing and level of electricity demand, is called demand-side management (DSM). Rebates to customers who install energy-efficient appliances and reduced rates for non-peakload use of electricity are examples of DSM programs.

DSM has both economic and environmental benefits. The economic benefit to customers lies in its ability to provide the same level of energy services at a lower cost. DSM is most advantageous when electric utilities can use it to eliminate the need for costly new capacity. The environmental benefit of DSM occurs when it lowers fossil fuel use. Because electricity generation relies heavily on the burning of fossil fuels, it is responsible for emissions of carbon dioxide, sulfur dioxide, and nitrogen oxides. To the extent that DSM reduces fossil fuel consumption, it contributes to improving the quality of the environment.

In 1994, electric utilities spent $2.7 billion on DSM programs, $28 million less than in 1993 (8.7). The actual peakload reduction, however, increased from 23,069 megawatts in 1993 to 25,001 megawatts in 1994, and the energy savings attributable to DSM programs rose from 45 billion kilowatthours in 1993 to 52 billion kilowatthours in 1994.

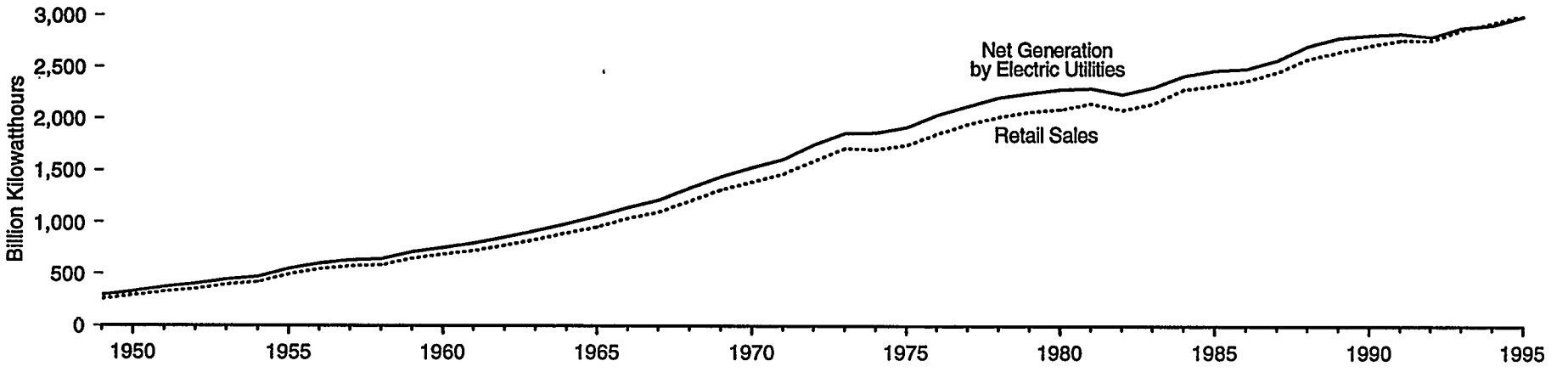
## Diagram 5. Electricity Flow, 1994
(Quadrillion Btu)



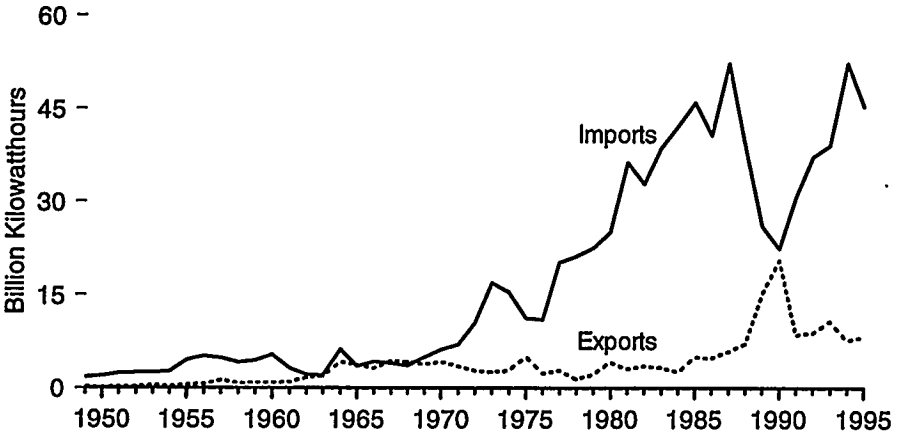

[a]Estimated as two-thirds of the energy consumed at electric utilities to generate electricity. See Note 1 at end of section.
[b]Estimated as 5 percent of gross generation of electricity by utilities. See Note 1 at end of section.
[c]Estimated as 9 percent of gross generation of electricity by utilities. See Note 1 at end of section.
[d]"Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.
[e]"Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution. See Table 10.9.
[f]Data not available.
[g]Includes sales, interchanges, and exchanges of electric energy with other nonutilities.
[h]Includes purchases, interchanges, and exchanges of electric energy with electric utilities and other nonutilities.
Note: Totals may not equal sum of components due to independent rounding.
Sources: Tables 8.1, 8.3, 8.5, 8.6, 8.12, 10.9, and A7.

# Figure 8.1 Electricity Overview

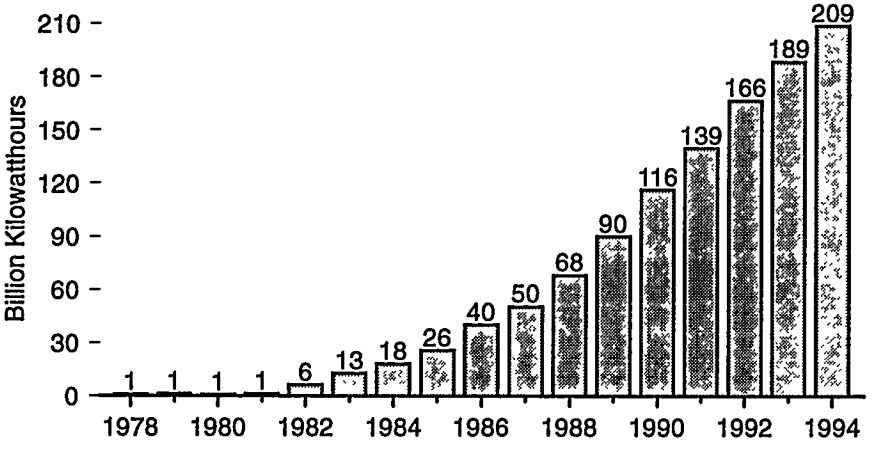
**Net Generation by Electric Utilities and Retail Sales, 1949-1995**




**International Electricity Trade, 1949-1995**




**Purchases by Electric Utilities from Nonutility Power Producers, 1978-1994**




Notes: • The difference between net generation at electric utilities and retail sales is purchases by electric utilities from nonutility power producers and imports minus exports, transmission and distribution losses, data collection frame differences, and nonsampling error.

• Because vertical scales differ, graphs should not be compared.

Source: Table 8.1.

# Table 8.1 Electricity Overview, 1949-1995

(Billion Kilowatthours)

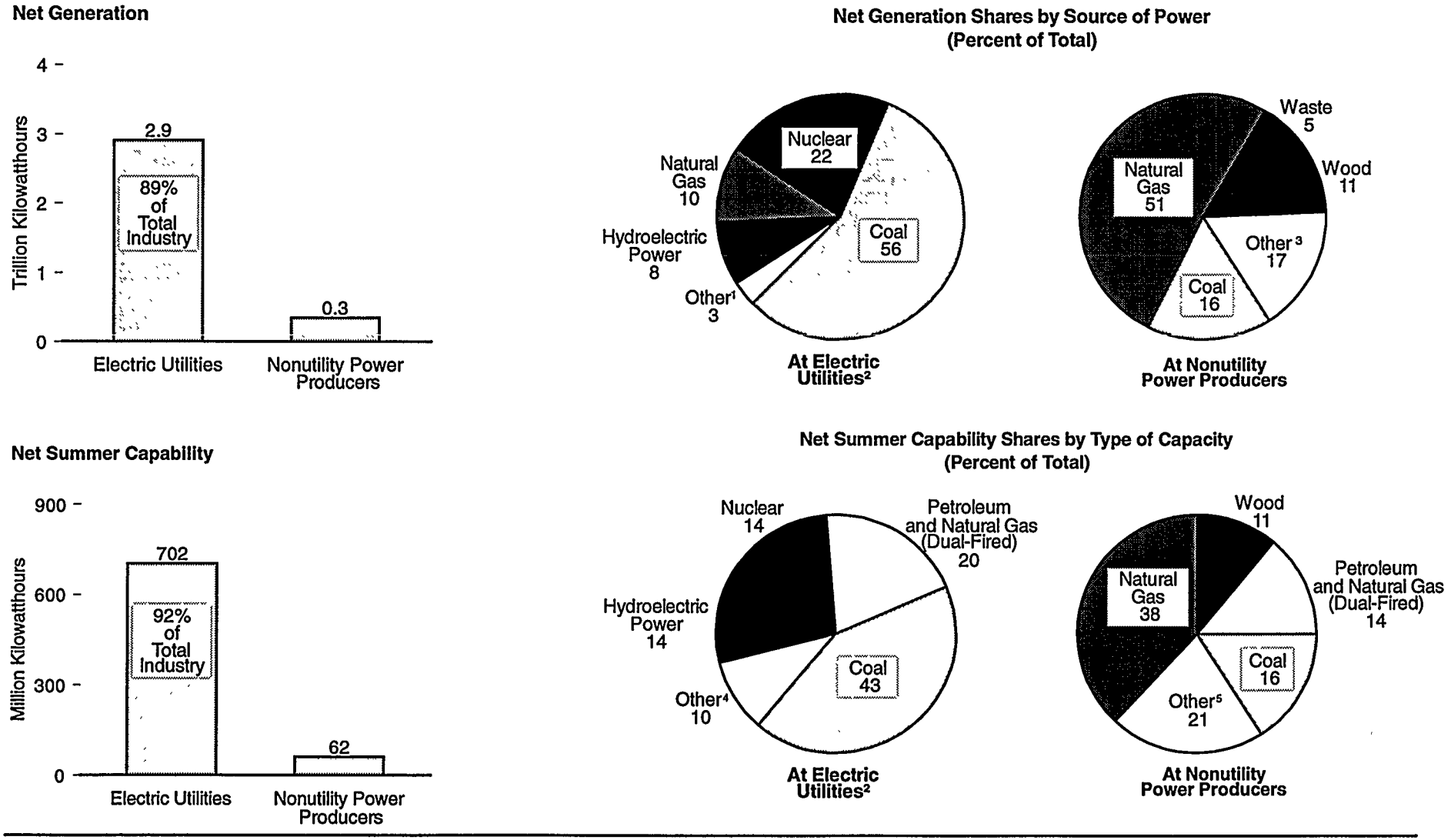
| Year | Net Generation by Electric Utilities [1] | Purchases by Electric Utilities from Nonutility Power Producers [2] | Imports [3] | Exports [3] | Losses and Unaccounted for [4] | Retail Sales |
|---|---|---|---|---|---|---|
| 1949 | 291 | NA | 2 | (s) | 38 | 255 |
| 1950 | 329 | NA | 2 | (s) | 39 | 291 |
| 1951 | 371 | NA | 2 | (s) | 43 | 330 |
| 1952 | 399 | NA | 3 | (s) | 45 | 356 |
| 1953 | 443 | NA | 2 | (s) | 48 | 396 |
| 1954 | 472 | NA | 3 | (s) | 50 | 424 |
| 1955 | 547 | NA | 5 | (s) | 54 | 497 |
| 1956 | 601 | NA | 5 | 1 | 59 | 546 |
| 1957 | 632 | NA | 5 | 1 | 59 | 576 |
| 1958 | 645 | NA | 4 | 1 | 61 | 588 |
| 1959 | 710 | NA | 4 | 1 | 67 | 647 |
| 1960 | 756 | NA | 5 | 1 | 72 | 688 |
| 1961 | 794 | NA | 3 | 1 | 74 | 722 |
| 1962 | 855 | NA | 2 | 2 | 77 | 778 |
| 1963 | 917 | NA | 2 | 2 | 84 | 833 |
| 1964 | 984 | NA | 6 | 4 | 90 | 896 |
| 1965 | 1,055 | NA | 4 | 4 | 101 | 954 |
| 1966 | 1,144 | NA | 4 | 3 | 110 | 1,035 |
| 1967 | 1,214 | NA | 4 | 4 | 115 | 1,099 |
| 1968 | 1,329 | NA | 4 | 4 | 126 | 1,203 |
| 1969 | 1,442 | NA | 5 | 4 | 129 | 1,314 |
| 1970 | 1,532 | NA | 6 | 4 | 142 | 1,392 |
| 1971 | 1,613 | NA | 7 | 4 | 147 | 1,470 |
| 1972 | 1,750 | NA | 10 | 3 | 162 | 1,595 |
| 1973 | 1,861 | NA | 17 | 3 | 162 | 1,713 |
| 1974 | 1,867 | NA | 15 | 3 | 174 | 1,706 |
| 1975 | 1,918 | NA | 11 | 5 | 177 | 1,747 |
| 1976 | 2,038 | NA | 11 | 2 | 191 | 1,855 |
| 1977 | 2,124 | NA | 20 | 3 | 193 | 1,948 |
| 1978 | 2,206 | 1 | 21 | 1 | 209 | 2,018 |
| 1979 | 2,247 | 1 | 23 | 2 | 198 | 2,071 |
| 1980 | 2,286 | 1 | 25 | 4 | 214 | 2,094 |
| 1981 | 2,295 | 1 | 36 | 3 | 182 | 2,147 |
| 1982 | 2,241 | 6 | 33 | 4 | 190 | 2,086 |
| 1983 | 2,310 | 13 | 39 | 3 | 207 | 2,151 |
| 1984 | 2,416 | 18 | 42 | 3 | 188 | 2,286 |
| 1985 | 2,470 | 26 | 46 | 5 | 212 | 2,324 |
| 1986 | 2,487 | 40 | 41 | 5 | 194 | 2,369 |
| 1987 | 2,572 | 50 | 52 | 6 | 211 | 2,457 |
| 1988 | 2,704 | 68 | 39 | 7 | 226 | 2,578 |
| 1989 | 2,784 | 90 | 26 | 15 | 238 | 2,647 |
| 1990 | 2,808 | 116 | 23 | 21 | 214 | 2,713 |
| 1991 | 2,825 | 139 | 31 | 9 | 225 | 2,762 |
| 1992 | 2,797 | 166 | 37 | 9 | 229 | 2,763 |
| 1993 | 2,883 | 189 | 39 | 11 | 238 | 2,861 |
| 1994 | R2,911 | 209 | R52 | R8 | 230 | R2,935 |
| 1995P | 2,995 | NA | 45 | 8 | NA | 3,005 |

[1] See Note 2 at end of section.
[2] See Glossary.
[3] Electricity transmitted across U.S. borders with Canada and Mexico.
[4] Transmission and distribution losses, data collection frame differences, and nonsampling error.
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Sources: **Net Generation by Electric Utilities:** See Table 8.3. **Purchases by Electric Utilities from Nonutility Power Producers:** • 1978-1985—Federal Energy Regulatory Commission, Form FERC-1, "Annual Report of Major Electric Utilities, Licensees and Others." • 1986-1994—Energy Information Administration (EIA), Form EIA-861, "Annual Electric Utility Report." • 1995—Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distribution." **Imports and Exports:** • 1949-September 1977—unpublished Federal Power Commission data. • October 1977-1980—unpublished Economic Regulatory Administration (ERA) data. • 1981—Office of Energy Emergency Operations, "Report on Electric Energy Exchanges with Canada and Mexico for Calendar Year 1981," April 1982 (revised June 1982). • 1982 and 1983—ERA, *Electricity Exchanges Across International Borders.* • 1984-1986—ERA, *Electricity Transactions Across International Borders.* • 1987 and 1988—ERA, Form ERA-781R, "Annual Report of International Electrical Export/Import Data." • 1989-1993—Fossil Energy, Form FE-781R, "Annual Report of International Electrical Export/Import Data." • 1994—EIA estimates based on preliminary data from the National Energy Board of Canada and Department of Energy, Fossil Energy. **Retail Sales:** See Table 8.6.

# Figure 8.2 Electric Power Industry Net Generation and Net Summer Capability, 1994




[1] "Other" is petroleum, geothermal energy, wood, waste, solar, and wind.

[2] Shares do not add exactly to 100 percent due to rounding of components.

[3] "Other" is petroleum, hydroelectric power, geothermal energy, wind, solar, nuclear, hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

[4] "Other" is petroleum, natural gas, geothermal energy, wood, waste, solar, and wind.

[5] "Other" is waste, hydroelectric power, petroleum, wind, geothermal energy, solar, nuclear, hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

Source: Table 8.2.

# Table 8.2 Electric Power Industry Net Generation and Net Summer Capability, 1992-1994

| Item | Electric Utilities | | | Nonutility Power Producers | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1992 | 1993 | 1994 | 1992 | 1993 | 1994 |
| **Net Generation (billion kilowatthours)** | 2,797.2 | 2,882.5 | 2,910.7 | 286.1 | 314.4 | 343.1 | 3,083.4 | 3,196.9 | 3,253.8 |
| Coal [1] | 1,575.9 | 1,639.2 | 1,635.5 | 45.2 | 50.9 | 56.2 | 1,621.1 | 1,690.0 | 1,691.7 |
| Natural Gas [2] | 263.9 | 258.9 | 291.1 | 154.4 | 169.5 | 174.8 | 418.3 | 428.4 | 465.9 |
| Petroleum [3] | 88.9 | 99.5 | 91.0 | 10.5 | 12.8 | 14.5 | 99.4 | 112.4 | 105.5 |
| Hydroelectric Power [4] | 239.6 | 265.1 | 243.7 | 9.4 | 11.4 | 13.1 | 248.9 | 276.5 | 256.8 |
| Geothermal Energy | 8.1 | 7.6 | 6.9 | 8.3 | 9.5 | 9.8 | 16.4 | 17.0 | 16.8 |
| Wood [5] | 0.8 | 0.9 | 0.8 | 34.8 | 35.9 | 37.0 | 35.6 | 36.8 | 37.8 |
| Waste [6] | 1.3 | 1.1 | 1.2 | 16.5 | 17.4 | 17.9 | 17.8 | 18.5 | 19.1 |
| Solar | (s) | (s) | (s) | 0.7 | 0.9 | 0.8 | 0.7 | 0.9 | 0.8 |
| Wind | (s) | (s) | (s) | 2.9 | 3.0 | 3.4 | 2.9 | 3.0 | 3.4 |
| Nuclear [7] | 618.8 | 610.3 | 640.4 | 0.1 | 0.1 | 0.5 | 618.8 | 610.4 | 640.5 |
| Other [8] | 0.0 | 0.0 | 0.0 | 3.4 | 3.1 | 15.5 | 3.4 | 3.1 | 15.5 |
| **Net Summer Capability (million kilowatts)** | 695.1 | 700.0 | 702.2 | 51.5 | 55.0 | 61.8 | 746.6 | 755.0 | 764.0 |
| Coal [1] | 300.5 | 300.8 | 301.1 | 7.9 | 9.1 | 9.7 | 308.5 | 309.9 | 310.8 |
| Natural Gas [2] | 15.7 | 16.6 | 19.4 | 18.7 | 20.3 | 23.2 | 34.4 | 36.9 | 42.7 |
| Petroleum [3] | 50.6 | 48.3 | 45.9 | 1.6 | 1.9 | 2.1 | 52.2 | 50.2 | 48.0 |
| Petroleum and Natural Gas (dual-fired) | 133.6 | 137.2 | 138.4 | 7.5 | 7.5 | 8.6 | 141.1 | 144.7 | 147.0 |
| Hydroelectric Power [4] | 93.4 | 95.9 | 96.0 | 2.6 | 2.6 | 3.3 | 96.0 | 98.6 | 99.3 |
| Geothermal Energy | 1.7 | 1.7 | 1.7 | 1.2 | 1.2 | 1.3 | 2.9 | 3.0 | 3.0 |
| Wood [5] | 0.2 | 0.2 | 0.3 | 6.4 | 6.7 | 7.0 | 6.7 | 6.9 | 7.3 |
| Waste [6] | 0.2 | 0.2 | 0.3 | 2.8 | 2.9 | 2.9 | 3.0 | 3.2 | 3.2 |
| Solar | (s) | (s) | (s) | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Wind | 0.0 | (s) | (s) | 1.8 | 1.8 | 1.7 | 1.8 | 1.8 | 1.7 |
| Nuclear [7] | 99.0 | 99.0 | 99.1 | (s) | (s) | 0.0 | 99.0 | 99.1 | 99.1 |
| Other [8] | 0.0 | 0.0 | 0.0 | 0.6 | 0.5 | 1.6 | 0.6 | 0.5 | 1.6 |

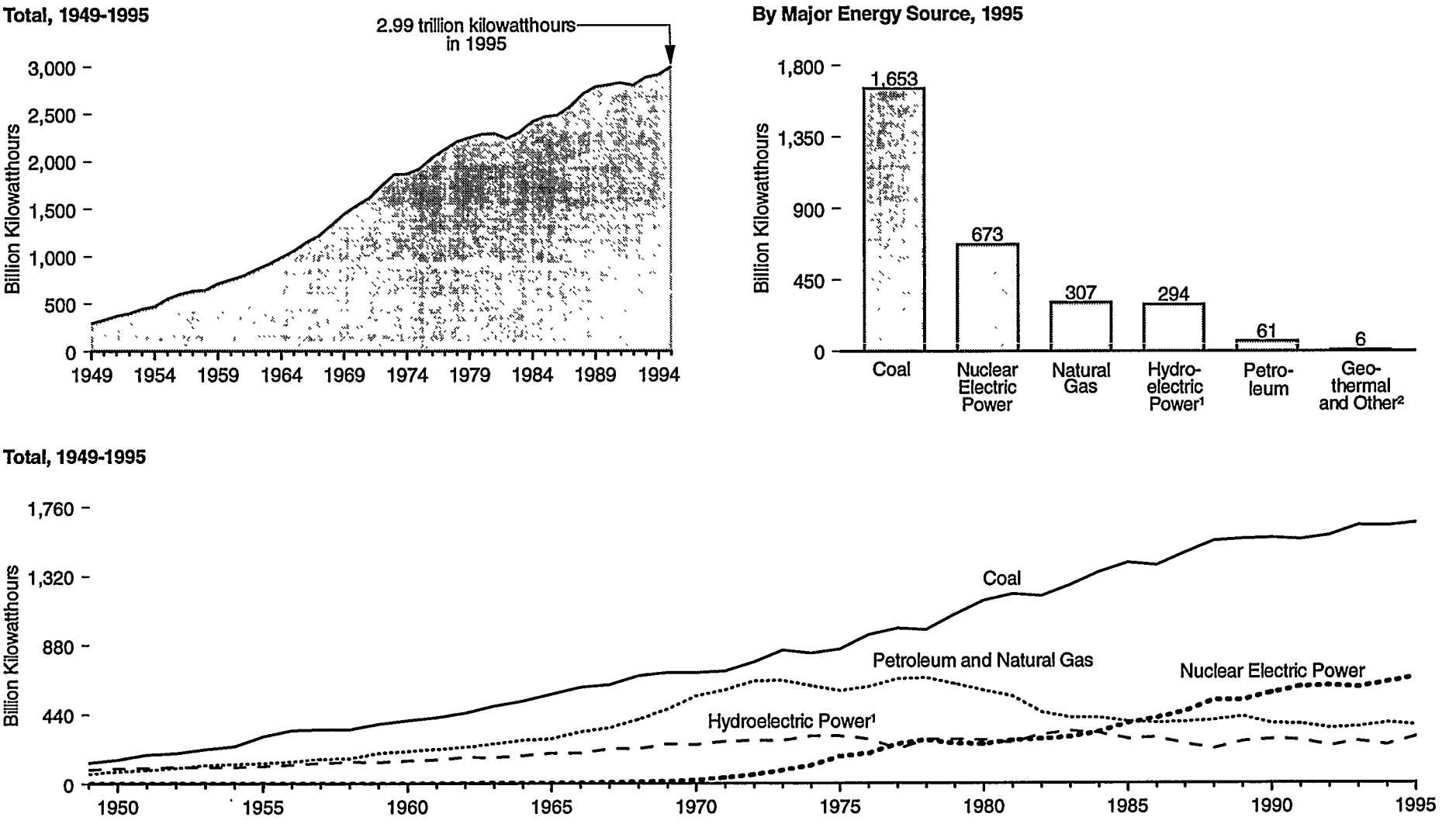
[1] Includes coal, anthracite culm, and coal waste.
[2] Includes natural gas, butane, ethane, propane, waste heat, and waste gases.
[3] Includes petroleum, petroleum coke, diesel, kerosene, and petroleum sludge and tar.
[4] In the nonutility sector, conventional hydroelectric power only; there are no pumped-storage projects.
[5] Includes wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[6] Includes municipal solid waste, agricultural waste, straw, tires, landfill gases, and other waste.
[7] Nuclear reactor and generator at Argonne National Laboratory used primarily for research and development in testing reactor fuels as well as for training. The generation from the unit is used for internal consumption.
[8] Includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

(s)=Less than 0.01 billion kilowatthours or less than 0.01 million kilowatts.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • For gross-to-net generation conversion methodology for nonutility power producers, refer to Energy Information Administration (EIA), *Electric Power Annual 1994, Volume II* (November 1995), p. 108. • Totals may not equal sum of components due to independent rounding.

Sources: **Electric Utilities Net Generation:** EIA, Form EIA-759, "Monthly Power Plant Report." **Electric Utilities Net Summer Capability:** EIA, Form EIA-860, "Annual Electric Generator Report." **Nonutility Power Producers:** EIA estimated data using Form EIA-867, "Annual Nonutility Power Producer Report."

## Figure 8.3 Electric Utility Net Generation of Electricity by Energy Source




[1] Conventional and pumped-storage hydroelectric power.

[2] "Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 8.3.

# Table 8.3 Electric Utility Net Generation of Electricity by Energy Source, 1949-1995

(Billion Kilowatthours)

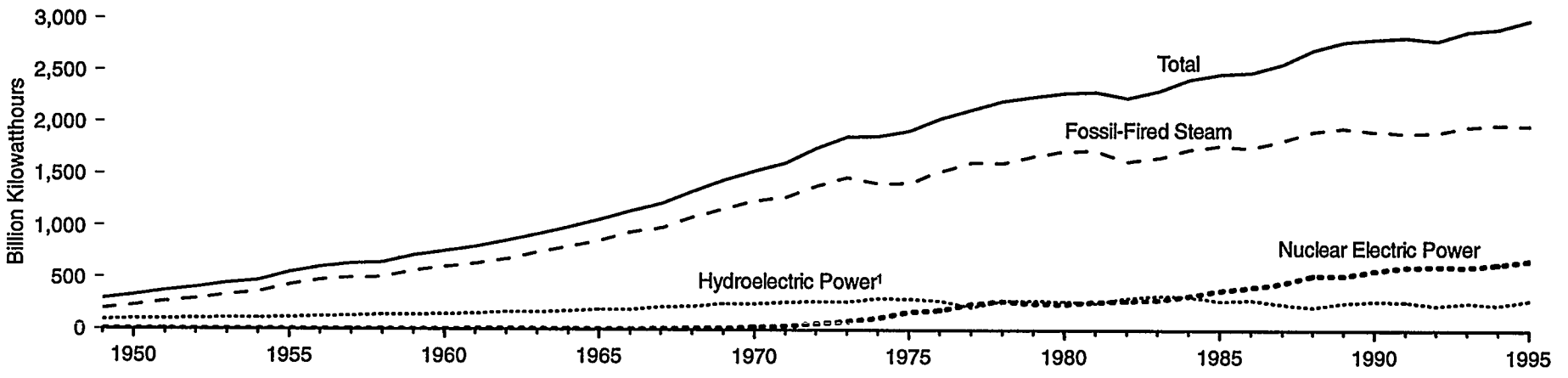
| Year | Fossil Fuels | | | | Nuclear Electric Power | Hydroelectric Pumped Storage [2] | Renewable Energy | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Coal | Natural Gas | Petroleum [1] | Total | | | Conventional Hydroelectric Power | Geothermal Energy and Other [3] | Total | |
| 1949 | 135 | 37 | 29 | 201 | 0 | [4] | 90 | (s) | 90 | 291 |
| 1950 | 155 | 45 | 34 | 233 | 0 | [4] | 96 | (s) | 96 | 329 |
| 1951 | 185 | 57 | 29 | 271 | 0 | [4] | 100 | (s) | 100 | 371 |
| 1952 | 195 | 68 | 30 | 294 | 0 | [4] | 105 | (s) | 106 | 399 |
| 1953 | 219 | 80 | 38 | 337 | 0 | [4] | 105 | (s) | 106 | 443 |
| 1954 | 239 | 94 | 32 | 364 | 0 | [4] | 107 | (s) | 107 | 472 |
| 1955 | 301 | 95 | 37 | 434 | 0 | [4] | 113 | (s) | 113 | 547 |
| 1956 | 339 | 104 | 36 | 478 | 0 | [4] | 122 | (s) | 122 | 601 |
| 1957 | 346 | 114 | 40 | 501 | (s) | [4] | 130 | (s) | 130 | 632 |
| 1958 | 344 | 120 | 40 | 504 | (s) | [4] | 140 | (s) | 140 | 645 |
| 1959 | 378 | 147 | 47 | 572 | (s) | [4] | 138 | (s) | 138 | 710 |
| 1960 | 403 | 158 | 48 | 609 | 1 | [4] | 146 | (s) | 146 | 756 |
| 1961 | 422 | 169 | 49 | 640 | 2 | [4] | 152 | (s) | 152 | 794 |
| 1962 | 450 | 184 | 49 | 683 | 2 | [4] | 169 | (s) | 169 | 855 |
| 1963 | 494 | 202 | 52 | 748 | 3 | [4] | 166 | (s) | 166 | 917 |
| 1964 | 526 | 220 | 57 | 803 | 3 | [4] | 177 | (s) | 177 | 984 |
| 1965 | 571 | 222 | 65 | 857 | 4 | [4] | 194 | (s) | 194 | 1,055 |
| 1966 | 613 | 251 | 79 | 944 | 6 | [4] | 195 | 1 | 195 | 1,144 |
| 1967 | 630 | 265 | 89 | 985 | 8 | [4] | 222 | 1 | 222 | 1,214 |
| 1968 | 685 | 304 | 104 | 1,094 | 13 | [4] | 222 | 1 | 223 | 1,329 |
| 1969 | 706 | 333 | 138 | 1,177 | 14 | [4] | 250 | 1 | 251 | 1,442 |
| 1970 | 704 | 373 | 184 | 1,261 | 22 | [4] | 248 | 1 | 249 | 1,532 |
| 1971 | 713 | 374 | 220 | 1,307 | 38 | [4] | 266 | 1 | 267 | 1,613 |
| 1972 | 771 | 376 | 274 | 1,421 | 54 | [4] | 273 | 2 | 274 | 1,750 |
| 1973 | 848 | 341 | 314 | 1,503 | 83 | [4] | 272 | 2 | 274 | 1,861 |
| 1974 | 828 | 320 | 301 | 1,449 | 114 | [4] | 301 | 3 | 304 | 1,867 |
| 1975 | 853 | 300 | 289 | 1,442 | 173 | [4] | 300 | 3 | 303 | 1,918 |
| 1976 | 944 | 295 | 320 | 1,559 | 191 | [4] | 284 | 4 | 288 | 2,038 |
| 1977 | 985 | 306 | 358 | 1,649 | 251 | [4] | 220 | 4 | 225 | 2,124 |
| 1978 | 976 | 305 | 365 | 1,646 | 276 | [4] | 280 | 3 | 284 | 2,206 |
| 1979 | 1,075 | 329 | 304 | 1,708 | 255 | [4] | 280 | 4 | 284 | 2,247 |
| 1980 | 1,162 | 346 | 246 | 1,754 | 251 | [4] | 276 | 6 | 282 | 2,286 |
| 1981 | 1,203 | 346 | 206 | 1,755 | 273 | [4] | 261 | 6 | 267 | 2,295 |
| 1982 | 1,192 | 305 | 147 | 1,644 | 283 | [4] | 309 | 5 | 314 | 2,241 |
| 1983 | 1,259 | 274 | 144 | 1,678 | 294 | [4] | 332 | 6 | 339 | 2,310 |
| 1984 | 1,342 | 297 | 120 | 1,759 | 328 | [4] | 321 | 9 | 330 | 2,416 |
| 1985 | 1,402 | 292 | 100 | 1,794 | 384 | [4] | 281 | 11 | 292 | 2,470 |
| 1986 | 1,386 | 249 | 137 | 1,771 | 414 | [4] | 291 | R11 | 302 | 2,487 |
| 1987 | 1,464 | 273 | 118 | 1,855 | 455 | [4] | 250 | 12 | 262 | 2,572 |
| 1988 | 1,541 | 253 | 149 | 1,942 | 527 | [4] | 223 | 12 | 235 | 2,704 |
| 1989 | 1,554 | 267 | 158 | 1,979 | 529 | [4] | 265 | 11 | 276 | 2,784 |
| 1990 | 1,560 | 264 | 117 | 1,941 | 577 | -4 | 283 | 11 | 294 | 2,808 |
| 1991 | 1,551 | 264 | 111 | 1,927 | 613 | -5 | 280 | 10 | 290 | 2,825 |
| 1992 | 1,576 | 264 | 89 | 1,929 | 619 | -4 | 244 | 10 | 254 | 2,797 |
| 1993 | 1,639 | 259 | 100 | 1,998 | 610 | -4 | 269 | 10 | 279 | 2,883 |
| 1994 | 1,635 | 291 | 91 | R2,018 | R640 | -3 | 247 | 9 | 256 | R2,911 |
| 1995P | 1,653 | 307 | 61 | 2,021 | 673 | -3 | 296 | 6 | 303 | 2,995 |

[1] Distillate fuel oil, residual fuel oil (including crude oil burned as fuel), jet fuel, and petroleum coke.
[2] Represents total pumped storage facility production minus energy used for pumping.
[3] "Other" is wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution. See Table 10.8 for components of this column.
[4] Included in conventional hydroelectric power.
R=Revised data. P=Preliminary data. (s)=Less than 0.5 billion kilowatthours.

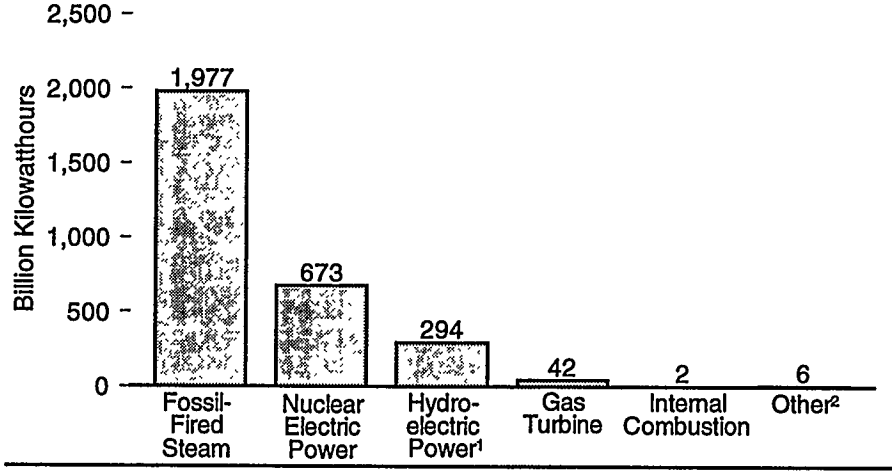
Notes: • See Notes 2 and 3 at end of section. • Totals may not equal sum of components due to independent rounding.
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

# Figure 8.4 Electric Utility Net Generation of Electricity by Prime Mover

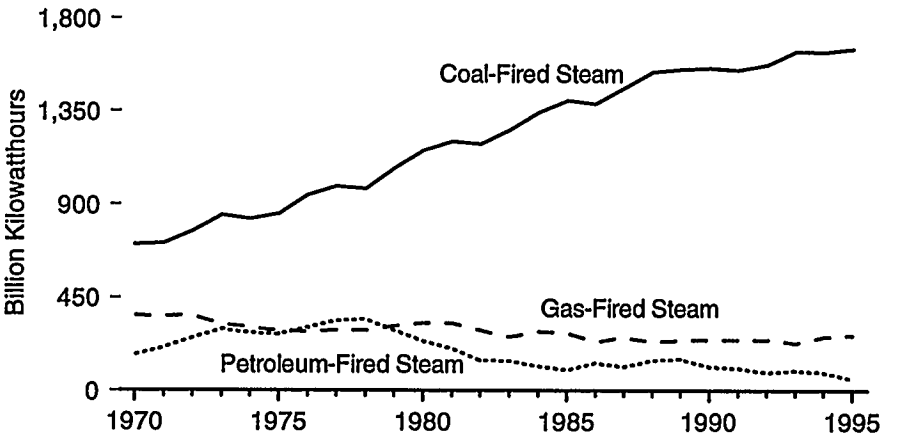
**Total, 1949-1995**




**Total by Prime Mover, 1995**




**Fossil-Fired Steam by Fuel, 1970-1995**




[1] Conventional and pumped-storage hydroelectric power.

[2] "Other" is geothermal, wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 8.4.

# Table 8.4 Electric Utility Net Generation of Electricity by Prime Mover, 1949-1995

(Billion Kilowatthours)

| Year | Fossil-Fired Steam | | | | Internal Combustion | Gas Turbine | Nuclear Electric Power | Hydroelectric Power | | | Other [1] | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal-Fired | Petroleum-Fired | Gas-Fired | Total | | | | Conventional | Pumped Storage | Total | | |
| 1949 | 135 | NA | NA | 197 | 3 | [2] | 0 | 90 | [3] | 90 | (s) | 291 |
| 1950 | 155 | NA | NA | 229 | 4 | [2] | 0 | 96 | [3] | 96 | (s) | 329 |
| 1951 | 185 | NA | NA | 267 | 4 | [2] | 0 | 100 | [3] | 100 | (s) | 371 |
| 1952 | 195 | NA | NA | 290 | 4 | [2] | 0 | 105 | [3] | 105 | (s) | 399 |
| 1953 | 219 | NA | NA | 333 | 4 | [2] | 0 | 105 | [3] | 105 | (s) | 443 |
| 1954 | 239 | NA | NA | 361 | 4 | [2] | 0 | 107 | [3] | 107 | (s) | 472 |
| 1955 | 301 | NA | NA | 430 | 4 | [2] | 0 | 113 | [3] | 113 | (s) | 547 |
| 1956 | 339 | NA | NA | 474 | 4 | [2] | 0 | 122 | [3] | 122 | (s) | 601 |
| 1957 | 346 | NA | NA | 497 | 4 | [2] | (s) | 130 | [3] | 130 | (s) | 632 |
| 1958 | 344 | NA | NA | 500 | 4 | [2] | (s) | 140 | [3] | 140 | (s) | 645 |
| 1959 | 378 | NA | NA | 567 | 4 | [2] | (s) | 138 | [3] | 138 | (s) | 710 |
| 1960 | 403 | NA | NA | 603 | 4 | [2] | 1 | 146 | [3] | 146 | (s) | 756 |
| 1961 | 422 | NA | NA | 634 | 5 | [2] | 2 | 152 | [3] | 152 | (s) | 794 |
| 1962 | 450 | NA | NA | 677 | 5 | [2] | 2 | 169 | [3] | 169 | (s) | 855 |
| 1963 | 494 | NA | NA | 742 | 5 | [2] | 3 | 166 | [3] | 166 | (s) | 917 |
| 1964 | 526 | NA | NA | 798 | 6 | [2] | 3 | 177 | [3] | 177 | (s) | 984 |
| 1965 | 571 | NA | NA | 851 | 6 | [2] | 4 | 194 | [3] | 194 | (s) | 1,055 |
| 1966 | 613 | NA | NA | 938 | 5 | [2] | 6 | 195 | [3] | 195 | 1 | 1,144 |
| 1967 | 630 | NA | NA | 980 | 5 | [2] | 8 | 222 | [3] | 222 | 1 | 1,214 |
| 1968 | 685 | NA | NA | 1,084 | 9 | [2] | 13 | 222 | [3] | 222 | 1 | 1,329 |
| 1969 | 706 | NA | NA | 1,163 | 14 | [2] | 14 | 250 | [3] | 250 | 1 | 1,442 |
| 1970 | 704 | 174 | 361 | 1,240 | 6 | 16 | 22 | 248 | [3] | 248 | 1 | 1,532 |
| 1971 | 713 | 206 | 360 | 1,279 | 6 | 22 | 38 | 266 | [3] | 266 | 1 | 1,613 |
| 1972 | 771 | 253 | 361 | 1,385 | 7 | 29 | 54 | 273 | [3] | 273 | 2 | 1,750 |
| 1973 | 848 | 296 | 323 | 1,467 | 7 | 30 | 83 | 272 | [3] | 272 | 2 | 1,861 |
| 1974 | 828 | 279 | 304 | 1,411 | 6 | 32 | 114 | 301 | [3] | 301 | 3 | 1,867 |
| 1975 | 853 | 273 | 288 | 1,414 | 6 | 22 | 173 | 300 | [3] | 300 | 3 | 1,918 |
| 1976 | 944 | 302 | 284 | 1,530 | 5 | 24 | 191 | 284 | [3] | 284 | 4 | 2,038 |
| 1977 | 985 | 338 | 292 | 1,615 | 5 | 29 | 251 | 220 | [3] | 220 | 4 | 2,124 |
| 1978 | 976 | 345 | 290 | 1,610 | 5 | 31 | 276 | 280 | [3] | 280 | 3 | 2,206 |
| 1979 | 1,075 | 290 | 311 | 1,676 | 4 | 28 | 255 | 280 | [3] | 280 | 4 | 2,247 |
| 1980 | 1,162 | 238 | 326 | 1,726 | 4 | 24 | 251 | 276 | [3] | 276 | 6 | 2,286 |
| 1981 | 1,203 | 202 | 325 | 1,730 | 3 | 22 | 273 | 261 | [3] | 261 | 6 | 2,295 |
| 1982 | 1,192 | 144 | 291 | 1,628 | 2 | 14 | 283 | 309 | [3] | 309 | 5 | 2,241 |
| 1983 | 1,259 | 141 | 261 | 1,661 | 2 | 14 | 294 | 332 | [3] | 332 | 6 | 2,310 |
| 1984 | 1,342 | 117 | 284 | 1,742 | 2 | 15 | 328 | 321 | [3] | 321 | 9 | 2,416 |
| 1985 | 1,402 | 97 | 279 | 1,778 | 2 | 14 | 384 | 281 | [3] | 281 | 11 | 2,470 |
| 1986 | 1,386 | 133 | 236 | 1,756 | 2 | 14 | 414 | 291 | [3] | 291 | R11 | 2,487 |
| 1987 | 1,464 | 115 | 258 | 1,837 | 2 | 16 | 455 | 250 | [3] | 250 | 12 | 2,572 |
| 1988 | 1,541 | 144 | 236 | 1,921 | 2 | 20 | 527 | 223 | [3] | 223 | 12 | 2,704 |
| 1989 | 1,554 | 151 | 245 | 1,950 | 2 | 27 | 529 | 265 | [3] | 265 | 11 | 2,784 |
| 1990 | 1,560 | 113 | 246 | 1,919 | 2 | 12 | 577 | 283 | -4 | 280 | 11 | 2,808 |
| 1991 | 1,551 | 108 | 246 | 1,905 | 2 | 20 | 613 | 280 | -5 | 276 | 10 | 2,825 |
| 1992 | 1,576 | 86 | 246 | 1,908 | 2 | 19 | 619 | 244 | -4 | 240 | 10 | 2,797 |
| 1993 | 1,639 | 96 | 229 | 1,964 | 2 | 23 | 610 | 269 | -4 | 265 | 10 | 2,883 |
| 1994 | 1,635 | 86 | R260 | R1,982 | 2 | R34 | R640 | 247 | -3 | 244 | 9 | R2,911 |
| 1995P | 1,653 | 56 | 268 | 1,977 | 2 | 42 | 673 | 296 | -3 | 294 | 6 | 2,995 |

[1] "Other" is geothermal, wood, waste, wind, photovoltaic, and solar thermal energy used to generate electricity for distribution.

[2] Included in internal combustion.

[3] Included in conventional hydroelectric power.

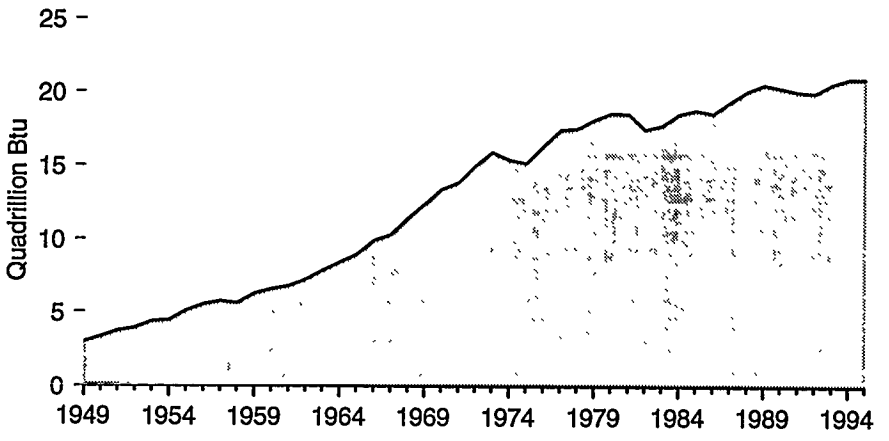
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 0.5 billion kilowatthours.

Notes: • See Notes 2 and 3 at end of section. • Totals may not equal sum of components due to independent rounding.

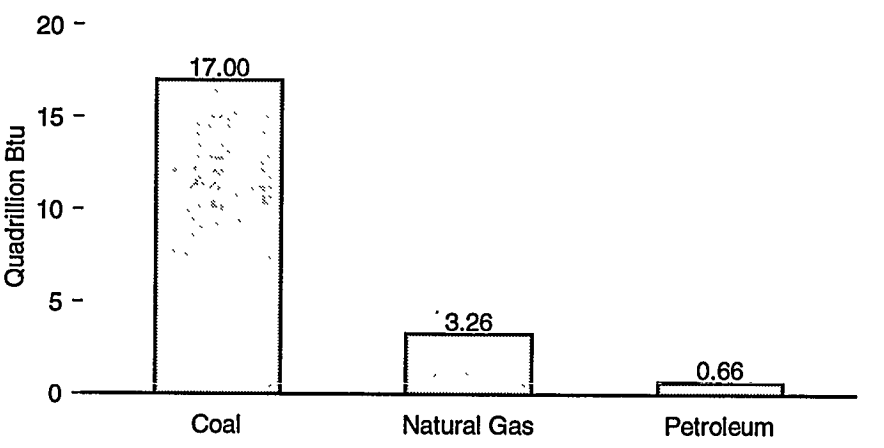
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

## Figure 8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity

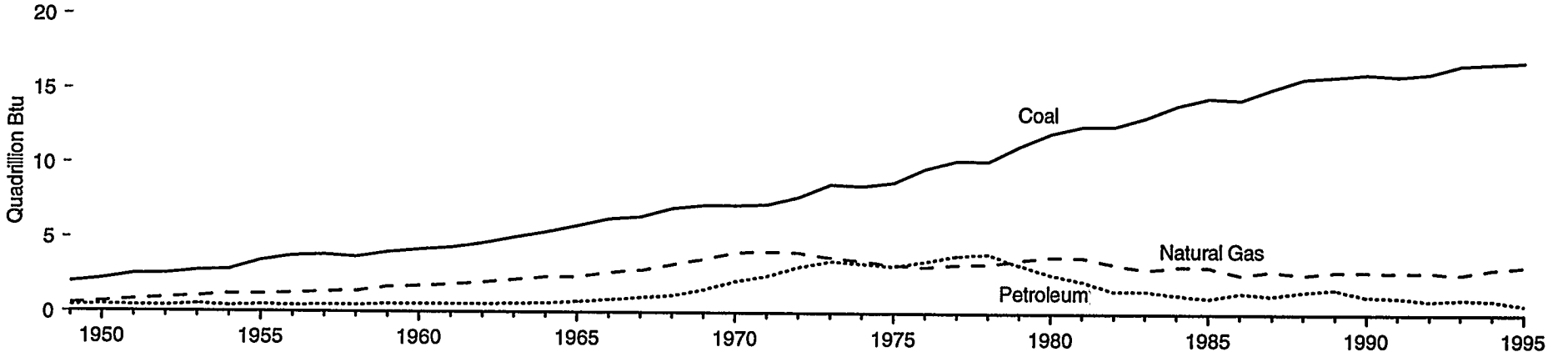
**Total, 1949-1995**




**By Energy Source, 1995**




**By Energy Source, 1949-1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 8.5

# Table 8.5 Electric Utility Consumption of Fossil Fuels To Generate Electricity, 1949-1995

| Year | Coal | | Natural Gas | | Petroleum [1] | | Total |
|---|---|---|---|---|---|---|---|
| | Million Short Tons | Quadrillion Btu | Billion Cubic Feet | Quadrillion Btu | Million Barrels | Quadrillion Btu | Quadrillion Btu |
| 1949 | 84.0 | 2.00 | 550.1 | 0.57 | 66.3 | 0.41 | 2.98 |
| 1950 | 91.9 | 2.20 | 628.9 | 0.65 | 75.4 | 0.47 | 3.32 |
| 1951 | 105.8 | 2.51 | 763.9 | 0.79 | 63.9 | 0.40 | 3.70 |
| 1952 | 107.1 | 2.56 | 910.1 | 0.94 | 67.2 | 0.42 | 3.92 |
| 1953 | 115.9 | 2.78 | 1,034.3 | 1.07 | 82.2 | 0.51 | 4.36 |
| 1954 | 118.4 | 2.84 | 1,165.5 | 1.21 | 66.7 | 0.42 | 4.46 |
| 1955 | 143.8 | 3.46 | 1,153.3 | 1.19 | 75.3 | 0.47 | 5.12 |
| 1956 | 158.3 | 3.79 | 1,239.3 | 1.28 | 72.7 | 0.45 | 5.53 |
| 1957 | 160.8 | 3.86 | 1,336.1 | 1.38 | 79.7 | 0.50 | 5.74 |
| 1958 | 155.7 | 3.72 | 1,372.9 | 1.42 | 77.7 | 0.49 | 5.63 |
| 1959 | 168.4 | 4.03 | 1,628.5 | 1.69 | 88.3 | 0.55 | 6.27 |
| 1960 | 176.7 | 4.23 | 1,724.8 | 1.79 | 88.2 | 0.55 | 6.57 |
| 1961 | 182.2 | 4.35 | 1,825.1 | 1.89 | 88.9 | 0.56 | 6.80 |
| 1962 | 193.3 | 4.62 | 1,966.0 | 2.03 | 89.3 | 0.56 | 7.22 |
| 1963 | 211.3 | 5.05 | 2,144.5 | 2.21 | 93.3 | 0.58 | 7.85 |
| 1964 | 225.4 | 5.38 | 2,322.9 | 2.40 | 101.1 | 0.63 | 8.41 |
| 1965 | 244.8 | 5.82 | 2,321.1 | 2.40 | 115.2 | 0.72 | 8.94 |
| 1966 | 266.5 | 6.30 | 2,609.9 | 2.70 | 140.9 | 0.88 | 9.88 |
| 1967 | 274.2 | 6.44 | 2,746.4 | 2.83 | 161.3 | 1.01 | 10.29 |
| 1968 | 297.8 | 6.99 | 3,147.9 | 3.25 | 188.6 | 1.18 | 11.42 |
| 1969 | 310.6 | 7.22 | 3,487.6 | 3.60 | 251.0 | 1.57 | 12.39 |
| 1970 | 320.2 | 7.23 | 3,931.9 | 4.05 | 338.7 | 2.12 | 13.40 |
| 1971 | 327.3 | 7.30 | 3,976.0 | 4.10 | 399.5 | 2.49 | 13.89 |
| 1972 | 351.8 | 7.81 | 3,976.9 | 4.08 | 496.9 | 3.10 | 14.99 |
| 1973 | 389.2 | 8.66 | 3,660.2 | 3.75 | 562.8 | 3.51 | 15.92 |
| 1974 | 391.8 | 8.53 | 3,443.4 | 3.52 | 539.4 | 3.36 | 15.42 |
| 1975 | 406.0 | 8.79 | 3,157.7 | 3.24 | 506.5 | 3.17 | 15.19 |
| 1976 | 448.4 | 9.72 | 3,080.9 | 3.15 | 556.3 | 3.48 | 16.35 |
| 1977 | 477.1 | 10.26 | 3,191.2 | 3.28 | 624.2 | 3.90 | 17.45 |
| 1978 | 481.2 | 10.24 | 3,188.4 | 3.30 | 637.8 | 3.99 | 17.52 |
| 1979 | 527.1 | 11.26 | 3,490.5 | 3.61 | 524.6 | 3.28 | 18.16 |
| 1980 | 569.3 | 12.12 | 3,681.6 | 3.81 | 421.1 | 2.63 | 18.57 |
| 1981 | 596.8 | 12.58 | 3,640.2 | 3.77 | 351.8 | 2.20 | 18.55 |
| 1982 | 593.7 | 12.58 | 3,225.5 | 3.34 | 250.5 | 1.57 | 17.49 |
| 1983 | 625.2 | 13.21 | 2,910.8 | 3.00 | 246.8 | 1.54 | 17.75 |
| 1984 | 664.4 | 14.02 | 3,111.3 | 3.22 | 205.7 | 1.29 | 18.53 |
| 1985 | 693.8 | 14.54 | 3,044.1 | 3.16 | 174.6 | 1.09 | 18.79 |
| 1986 | 685.1 | 14.44 | 2,602.4 | 2.69 | 232.0 | 1.45 | 18.59 |
| 1987 | 717.9 | 15.17 | 2,844.1 | 2.94 | 201.1 | 1.26 | 19.37 |
| 1988 | 758.4 | 15.85 | 2,635.6 | 2.71 | 250.1 | 1.56 | 20.12 |
| 1989 | 766.9 | 15.99 | 2,787.0 | 2.87 | 270.0 | 1.69 | 20.54 |
| 1990 | 773.5 | 16.19 | 2,787.3 | 2.88 | 200.2 | 1.25 | 20.32 |
| 1991 | 772.3 | 16.03 | 2,789.0 | 2.86 | 188.5 | 1.18 | 20.06 |
| 1992 | 779.9 | 16.21 | 2,765.6 | 2.83 | 152.3 | 0.95 | 19.99 |
| 1993 | 813.5 | 16.79 | 2,682.4 | 2.74 | 168.6 | 1.05 | 20.58 |
| 1994 | R817.3 | R16.90 | R2,987.1 | 3.05 | R155.4 | 0.97 | R20.92 |
| 1995P | 829.2 | 17.00 | 3,194.5 | 3.26 | 106.0 | 0.66 | 20.92 |

[1] These data show petroleum consumed by electric utilities and do not equate to petroleum supplied to (or delivered to) electric utilities. Included are residual fuel oil (including crude oil burned as fuel), distillate fuel oil, jet fuel, and petroleum coke. Petroleum coke is reported in short tons and has been converted to barrels at a rate of 5 barrels per short ton.

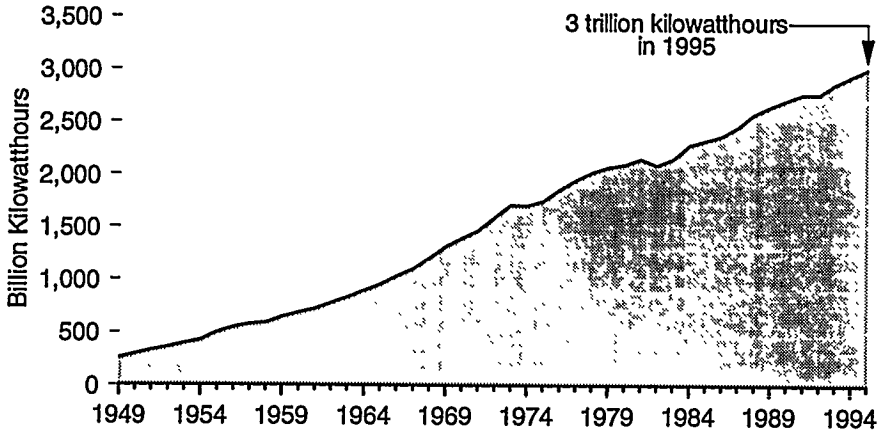
R=Revised data. P=Preliminary data.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

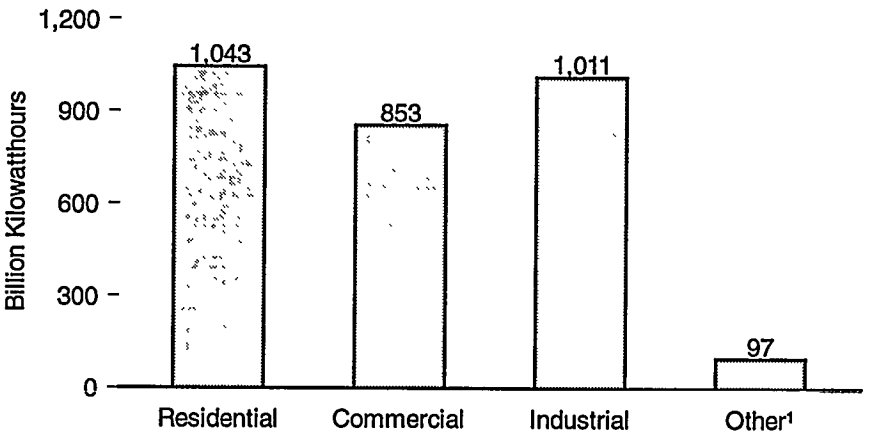
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

# Figure 8.6 Electric Utility Retail Sales of Electricity

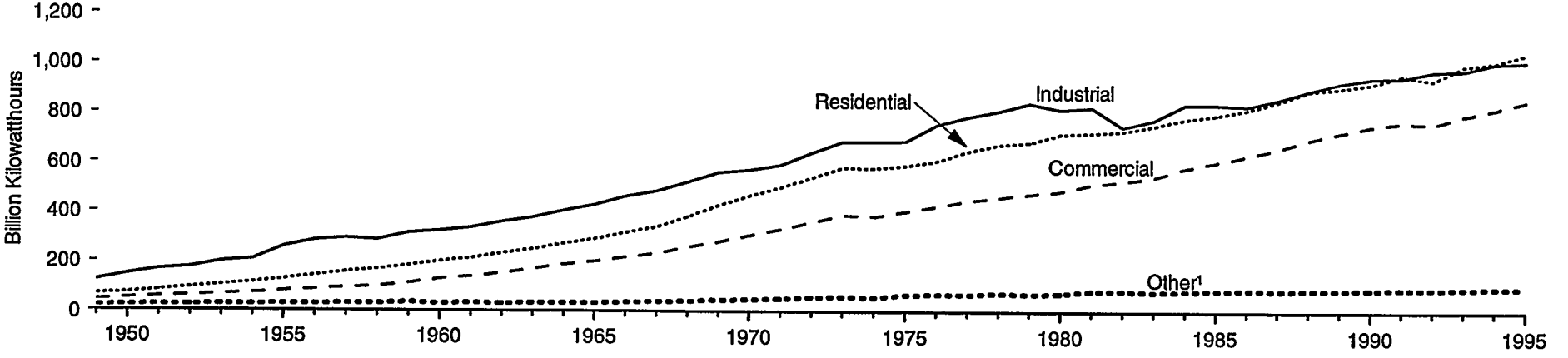
**Total, 1949-1995**




**By End-Use Sector, 1995**




**By End-Use Sector, 1949-1995**




[1] "Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.6.

# Table 8.6 Electric Utility Retail Sales of Electricity by End-Use Sector, 1949-1995

(Billion Kilowatthours)

| Year | Residential | Commercial | Industrial | Other [1] | Total |
|---|---|---|---|---|---|
| 1949 | 67 | 45 | 123 | 20 | 255 |
| 1950 | 72 | 51 | 146 | 22 | 291 |
| 1951 | 83 | 57 | 166 | 24 | 330 |
| 1952 | 94 | 62 | 176 | 24 | 356 |
| 1953 | 104 | 67 | 199 | 26 | 396 |
| 1954 | 116 | 72 | 208 | 27 | 424 |
| 1955 | 128 | 79 | 260 | 29 | 497 |
| 1956 | 143 | 87 | 286 | 30 | 546 |
| 1957 | 157 | 94 | 294 | 31 | 576 |
| 1958 | 169 | 100 | 287 | 32 | 588 |
| 1959 | 185 | 112 | 315 | 36 | 647 |
| 1960 | 201 | 131 | 324 | 32 | 688 |
| 1961 | 214 | 138 | 337 | 32 | 722 |
| 1962 | 233 | 153 | 360 | 32 | 778 |
| 1963 | 251 | 171 | 377 | 34 | 833 |
| 1964 | 272 | 187 | 405 | 32 | 896 |
| 1965 | 291 | 200 | 429 | 34 | 954 |
| 1966 | 317 | 218 | 464 | 37 | 1,035 |
| 1967 | 340 | 234 | 485 | 40 | 1,099 |
| 1968 | 382 | 258 | 521 | 42 | 1,203 |
| 1969 | 427 | 282 | 559 | 46 | 1,314 |
| 1970 | 466 | 307 | 571 | 48 | 1,392 |
| 1971 | 500 | 329 | 589 | 51 | 1,470 |
| 1972 | 539 | 359 | 641 | 56 | 1,595 |
| 1973 | 579 | 388 | 686 | 59 | 1,713 |
| 1974 | 578 | 385 | 685 | 58 | 1,706 |
| 1975 | 588 | 403 | 688 | 68 | 1,747 |
| 1976 | 606 | 425 | 754 | 70 | 1,855 |
| 1977 | 645 | 447 | 786 | 71 | 1,948 |
| 1978 | 674 | 461 | 809 | 73 | 2,018 |
| 1979 | 683 | 473 | 842 | 73 | 2,071 |
| 1980 | 717 | 488 | 815 | 74 | 2,094 |
| 1981 | 722 | 514 | 826 | 85 | 2,147 |
| 1982 | 730 | 526 | 745 | 86 | 2,086 |
| 1983 | 751 | 544 | 776 | 80 | 2,151 |
| 1984 | 780 | 583 | 838 | 85 | 2,286 |
| 1985 | 794 | 606 | 837 | 87 | 2,324 |
| 1986 | 819 | 631 | 831 | 89 | 2,369 |
| 1987 | 850 | 660 | 858 | 88 | 2,457 |
| 1988 | 893 | 699 | 896 | 90 | 2,578 |
| 1989 | 906 | 726 | 926 | 90 | 2,647 |
| 1990 | 924 | 751 | 946 | 92 | 2,713 |
| 1991 | 955 | 766 | 947 | 94 | 2,762 |
| 1992 | R936 | R761 | R973 | R93 | R2,763 |
| 1993 | 995 | 795 | 977 | 95 | 2,861 |
| 1994 | R1,008 | R820 | R1,008 | R98 | R2,935 |
| 1995P | 1,043 | 853 | 1,011 | 97 | 3,005 |

[1] "Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

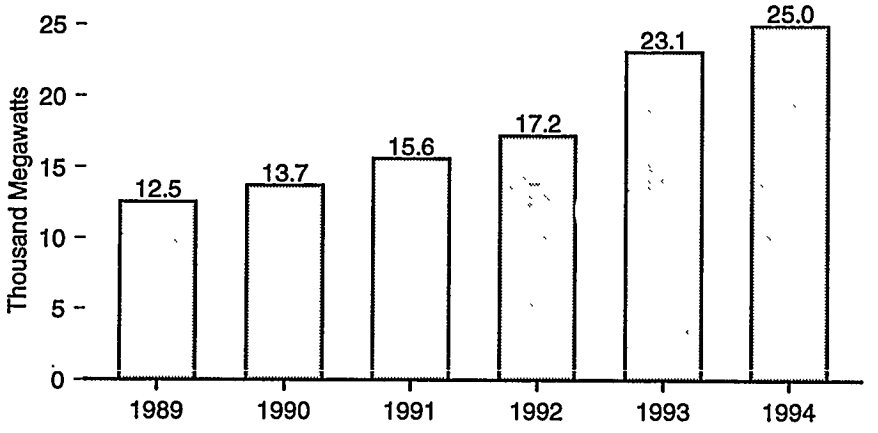
R=Revised data. P=Preliminary data.

Notes: • See Note 4 at end of section. • Totals may not equal sum of components due to independent rounding.

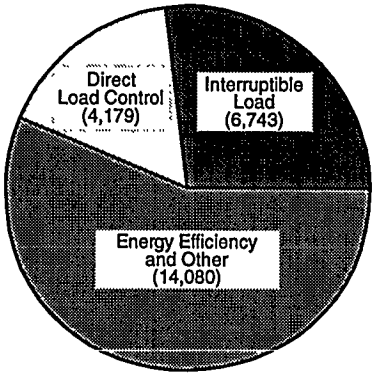
Sources: • 1949-September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • October 1977-February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenue and Income." • March 1980-1982—FERC, Form FPC-5, "Electric Utility Company Monthly Statement." • 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1994—EIA, Form EIA-861, "Annual Electric Utility Report." • 1995—EIA, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

# Figure 8.7 Electric Utility Demand-Side Management Programs

**Actual Peakload Reductions, Total of All Programs, 1989-1994**

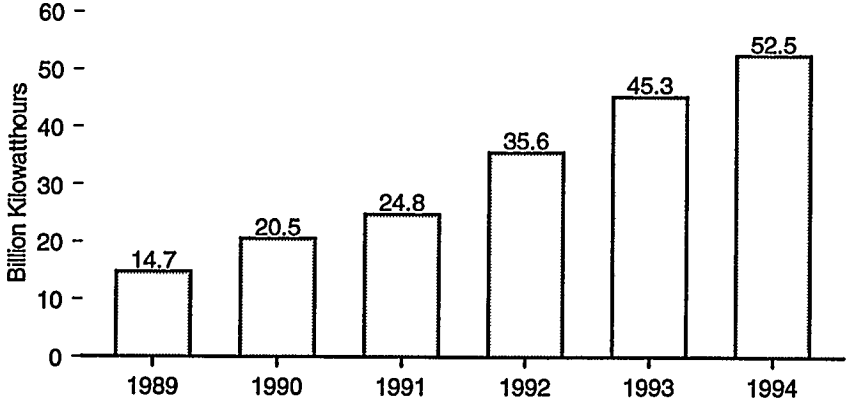



**Actual Peakload Reductions by Program, 1994**

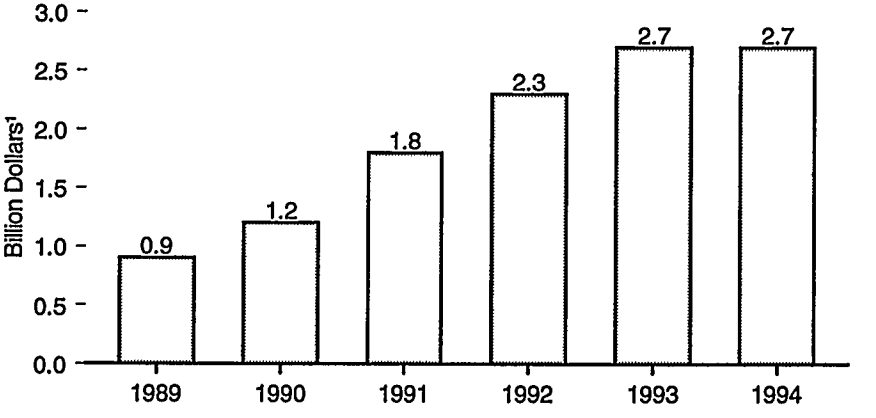



**Total: 25,001 Megawatts**

**Energy Savings, 1989-1994**




**Costs, 1989-1994**




[1] Nominal dollars.

Source: Table 8.7

# Table 8.7 Electric Utility Demand-Side Management Programs: Peakload Reductions, Energy Savings, and Costs, 1989-1994

| Year | Actual Peakload Reductions (megawatts) | | | | Energy Savings (million kilowatthours) | Costs (thousand dollars [6]) |
|---|---|---|---|---|---|---|
| | Direct Load Control [1,2] | Interruptible Load [1,3] | Energy Efficiency [4] and Other [5] | Total | | |
| 1989 | NA | NA | NA | 12,463 | R14,672 | 872,935 |
| 1990 | 3,692 | 4,219 | R5,793 | R13,704 | R20,458 | 1,177,457 |
| 1991 | 5,093 | 3,674 | R6,852 | R15,619 | R24,848 | R1,803,773 |
| 1992 | 3,779 | 3,579 | 9,847 | 17,204 | R35,563 | R2,348,094 |
| 1993 | 3,955 | 6,628 | R12,486 | R23,069 | R45,294 | R2,743,533 |
| 1994 | 4,179 | 6,743 | 14,080 | 25,001 | 52,483 | 2,715,657 |

[1] The actual reduction in peak load reflects the change in demand for electricity that results from a utility demand-side management program that is in effect at the time that the utility experiences its actual peak load as opposed to the potential installed peakload reduction capability. Differences between actual and potential peak reduction result from changes in weather, economic activity, and other variable conditions.

[2] Direct load control refers to program activities that can interrupt consumer load at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers.

[3] Interruptible load refers to program activities that, in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct control of the utility system operator or by action of the consumer at the direct request of the system operator. It usually involves commercial and industrial consumers. In some instances, the load reduction may be affected by direct action of the system operator (remote tripping) after notice to the consumer in accordance with contractual provisions.

[4] Energy efficiency refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption, often without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technically more advanced equipment to produce the same level of end-use services (e.g., lighting, heating, motor drive) with less electricity. Examples include high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating and air conditioning systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.

[5] For example, programs that promote consumer's substitution of electricity by other energy types and programs that limit or shift peak load from on-peak to off-peak time periods, such as space heating and water heating storage systems, cool storage systems, and load limiting devices in energy management systems.

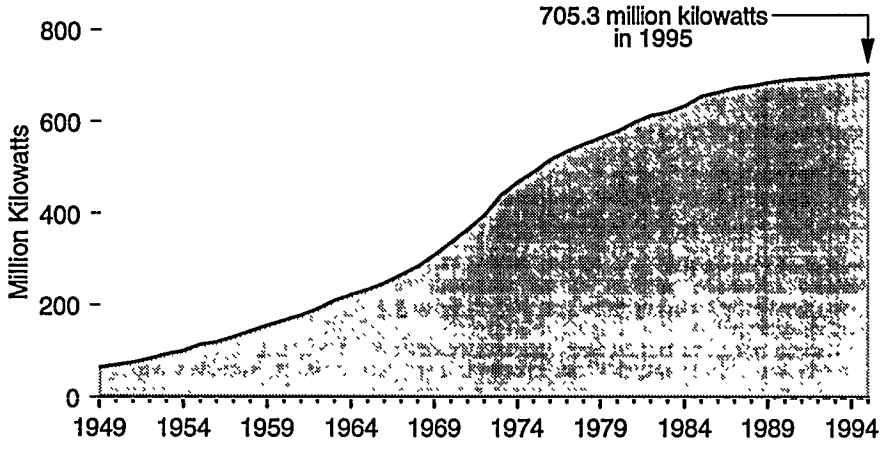
[6] Nominal dollars.

R=Revised data. NA=Not available.

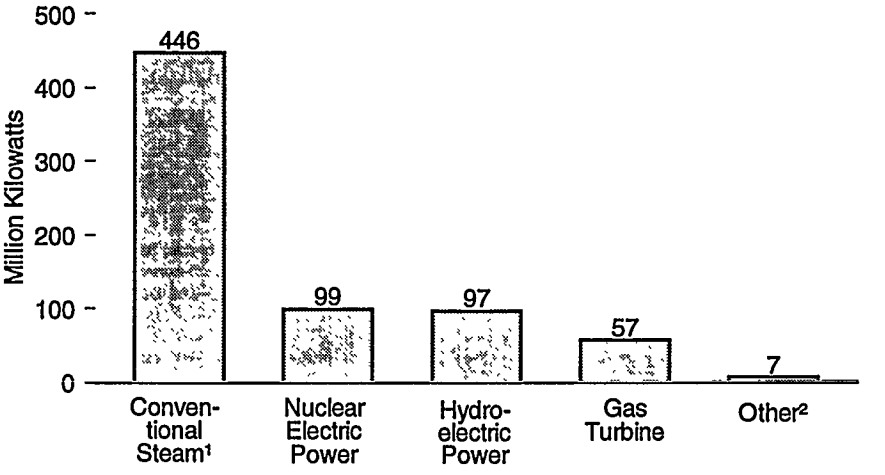
Sources: **Actual Peakload Reductions:** • 1989—Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994), Table 65. • 1990 and 1991—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 44. • 1992—EIA, *U.S. Electric Utility Demand-Side Management 1993* (July 1995), Table 13. • 1993 and 1994—EIA, *U.S. Electric Utility Demand-Side Management 1994* (December 1995), Table 13. **Energy Savings and Costs:** • 1989—EIA, *U.S. Electric Utility Demand-Side Management 1993* (July 1995), Table 1. • 1990-1994—EIA, *U.S. Electric Utility Demand-Side Management 1994* (December 1995), Table 1.

# Figure 8.8 Electric Utility Net Summer Capability, End of Year

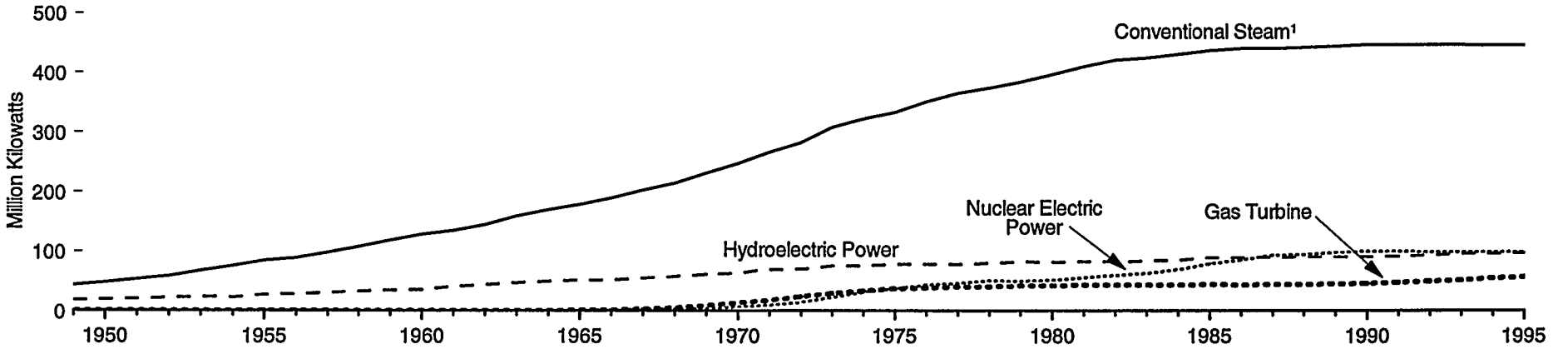
**Total, 1949-1995**




**By Prime Mover, 1995**




**By Prime Mover, 1949-1995**




¹ Includes fossil steam, wood waste, and nonwood waste.
² "Other" is internal combustion, geothermal, wind, photovoltaic, and solar thermal energy.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 8.8.

# Table 8.8 Electric Utility Net Summer Capability, End of Year 1949-1995

(Million Kilowatts)

| Year | Conventional Steam [1] | Internal Combustion | Gas Turbine | Nuclear Electric Power | Hydroelectric Power | | | Geothermal Energy and Other [2] | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Conventional | Pumped Storage | Total | | |
| 1949 | 43.2 | 1.7 | 0.0 | 0.0 | 18.5 | (3) | 18.5 | (s) | 63.4 |
| 1950 | 48.2 | 1.8 | 0.0 | 0.0 | 19.2 | (3) | 19.2 | (s) | 69.2 |
| 1951 | 53.1 | 1.9 | 0.0 | 0.0 | 20.5 | (3) | 20.5 | (s) | 75.5 |
| 1952 | 58.8 | 2.0 | 0.0 | 0.0 | 22.4 | (3) | 22.4 | (s) | 83.2 |
| 1953 | 67.5 | 2.1 | 0.0 | 0.0 | 23.8 | (3) | 23.8 | (s) | 93.3 |
| 1954 | 75.4 | 2.2 | 0.0 | 0.0 | 22.5 | (3) | 22.5 | (s) | 100.0 |
| 1955 | 84.6 | 2.3 | 0.0 | 0.0 | 27.4 | (3) | 27.4 | (s) | 114.2 |
| 1956 | 88.8 | 2.4 | 0.0 | 0.0 | 28.5 | (3) | 28.5 | (s) | 119.7 |
| 1957 | 97.9 | 2.3 | 0.0 | 0.1 | 30.7 | (3) | 30.7 | (s) | 131.1 |
| 1958 | 108.2 | 2.4 | 0.0 | 0.1 | 32.5 | (3) | 32.5 | (s) | 143.3 |
| 1959 | 118.5 | 2.5 | 0.0 | 0.1 | 34.8 | (3) | 34.8 | (s) | 155.9 |
| 1960 | 128.3 | 2.6 | 0.0 | 0.4 | 35.8 | (3) | 35.8 | (s) | 167.1 |
| 1961 | 135.1 | 2.8 | 0.0 | 0.4 | 40.7 | (3) | 40.7 | (s) | 179.0 |
| 1962 | 144.6 | 2.8 | 0.0 | 0.7 | 44.0 | (3) | 44.0 | (s) | 192.1 |
| 1963 | 158.4 | 3.0 | 0.5 | 0.8 | 47.0 | (3) | 47.0 | (s) | 209.7 |
| 1964 | 169.6 | 3.1 | 0.8 | 0.8 | 49.4 | (3) | 49.4 | (s) | 223.7 |
| 1965 | 178.7 | 3.2 | 1.1 | 0.8 | 51.0 | (3) | 51.0 | (s) | 234.8 |
| 1966 | 189.6 | 3.3 | 1.6 | 1.7 | 51.2 | (3) | 51.2 | (s) | 247.5 |
| 1967 | 202.5 | 3.6 | 2.8 | 2.7 | 55.0 | (3) | 55.0 | 0.1 | 266.7 |
| 1968 | 214.3 | 3.8 | 5.3 | 2.7 | 57.9 | (3) | 57.9 | 0.1 | 284.0 |
| 1969 | 231.4 | 4.0 | 8.4 | 4.4 | 61.6 | (3) | 61.6 | 0.1 | 309.8 |
| 1970 | 248.0 | 4.1 | 13.3 | 7.0 | 63.8 | (3) | 63.8 | 0.1 | 336.4 |
| 1971 | 266.0 | 4.2 | 17.9 | 9.0 | 69.1 | (3) | 69.1 | 0.2 | 366.4 |
| 1972 | 282.3 | 4.5 | 23.9 | 14.5 | 70.5 | (3) | 70.5 | 0.3 | 396.0 |
| 1973 | 307.9 | 4.7 | 28.8 | 22.7 | 75.4 | (3) | 75.4 | 0.4 | 439.8 |
| 1974 | 322.4 | 4.7 | 33.7 | 31.9 | 75.5 | (3) | 75.5 | 0.4 | 468.5 |
| 1975 | 333.3 | 4.8 | 37.1 | 37.3 | 78.4 | (3) | 78.4 | 0.5 | 491.3 |
| 1976 | 350.9 | 5.0 | 39.1 | 43.8 | 78.0 | (3) | 78.0 | 0.5 | 517.2 |
| 1977 | 365.3 | 5.0 | 40.3 | 46.3 | 78.6 | (3) | 78.6 | 0.5 | 535.9 |
| 1978 | 374.5 | 5.2 | 41.2 | 50.8 | 79.9 | (3) | 79.9 | 0.5 | 552.1 |
| 1979 | 384.6 | 5.2 | 42.5 | 49.7 | 82.9 | (3) | 82.9 | 0.7 | 565.5 |
| 1980 | 396.6 | 5.2 | 42.5 | 51.8 | 81.7 | (3) | 81.7 | 0.9 | 578.6 |
| 1981 | 410.7 | 5.3 | 43.2 | 56.0 | 82.4 | (3) | 82.4 | 0.9 | 598.3 |
| 1982 | 421.4 | 4.8 | 43.5 | 60.0 | 83.0 | (3) | 83.0 | 1.1 | 613.7 |
| 1983 | 424.9 | 4.7 | 43.3 | 63.0 | 83.9 | (3) | 83.9 | 1.2 | 621.1 |
| 1984 | 430.8 | 4.5 | 43.5 | 69.7 | 85.3 | (3) | 85.3 | 1.3 | 635.1 |
| 1985 | 436.8 | 4.7 | 43.9 | 79.4 | 88.9 | (3) | 88.9 | 1.6 | 655.2 |
| 1986 | 440.6 | 4.6 | 43.4 | 85.2 | 89.3 | (3) | 89.3 | 1.6 | 664.8 |
| 1987 | 440.3 | 4.8 | 44.2 | 93.6 | 89.7 | (3) | 89.7 | 1.5 | 674.1 |
| 1988 | 442.4 | 4.7 | 43.9 | 94.7 | 90.3 | (3) | 90.3 | 1.7 | 677.7 |
| 1989 | 444.4 | 4.6 | 45.4 | 98.2 | 90.5 | (3) | 90.5 | 1.6 | 684.6 |
| 1990 | 447.5 | 4.6 | 46.3 | 99.6 | 73.6 | 17.3 | 90.9 | 1.6 | 690.5 |
| 1991 | 447.0 | 4.5 | 48.3 | 99.6 | 73.6 | 18.4 | 92.0 | 1.6 | 693.0 |
| 1992 | 446.7 | 4.5 | 49.8 | 99.0 | 74.3 | 19.0 | 93.4 | 1.7 | 695.1 |
| 1993 | 446.8 | 4.8 | 51.7 | 99.0 | 74.8 | 21.1 | 95.9 | 1.7 | 700.0 |
| 1994 | R445.8 | 4.7 | 54.9 | R99.1 | R74.8 | 21.2 | R96.0 | R1.8 | [4]702.2 |
| 1995P | 446.2 | 4.7 | 56.9 | 99.1 | 74.9 | 21.8 | 96.6 | 1.8 | [4]705.3 |

[1] Includes fossil steam, wood, wood waste, and nonwood waste.

[2] "Other" is wind, photovoltaic, and solar thermal energy. Beginning with 1994, fuel cell units are also included.

[3] Included in conventional hydroelectric power.

[4] Includes two fuel cell units, totalling less than 0.05 million kilowatts.

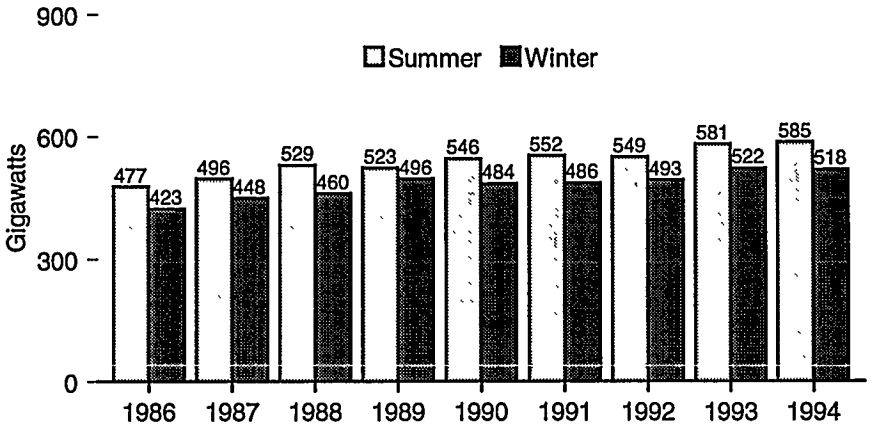
R=Revised data. P=Preliminary data. (s)=Less than 0.05 million kilowatts.

Notes: • See Glossary and Note 5 at end of section. • Totals may not equal sum of components due to independent rounding.

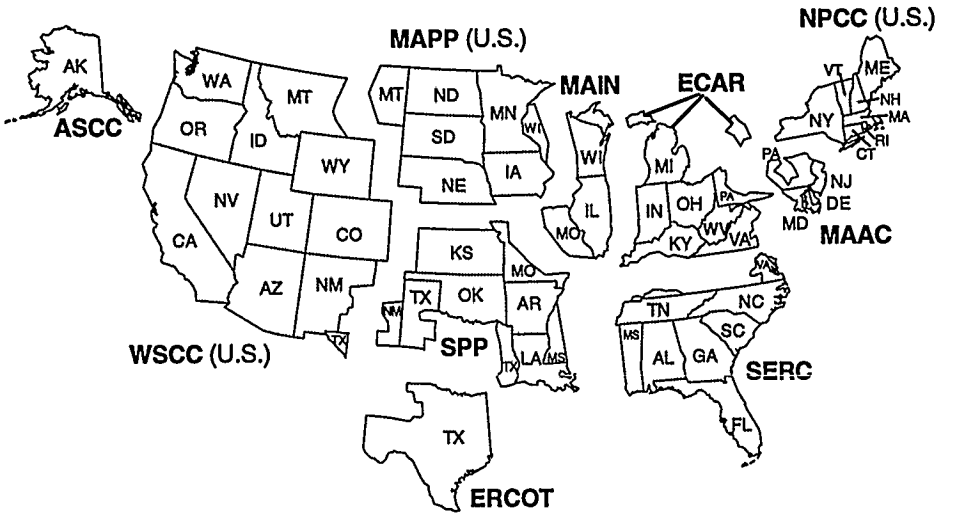
Sources: • 1949-1984—Energy Information Administration (EIA) estimates. • 1985 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

# Figure 8.9 Electric Utility Noncoincidental Peak Load

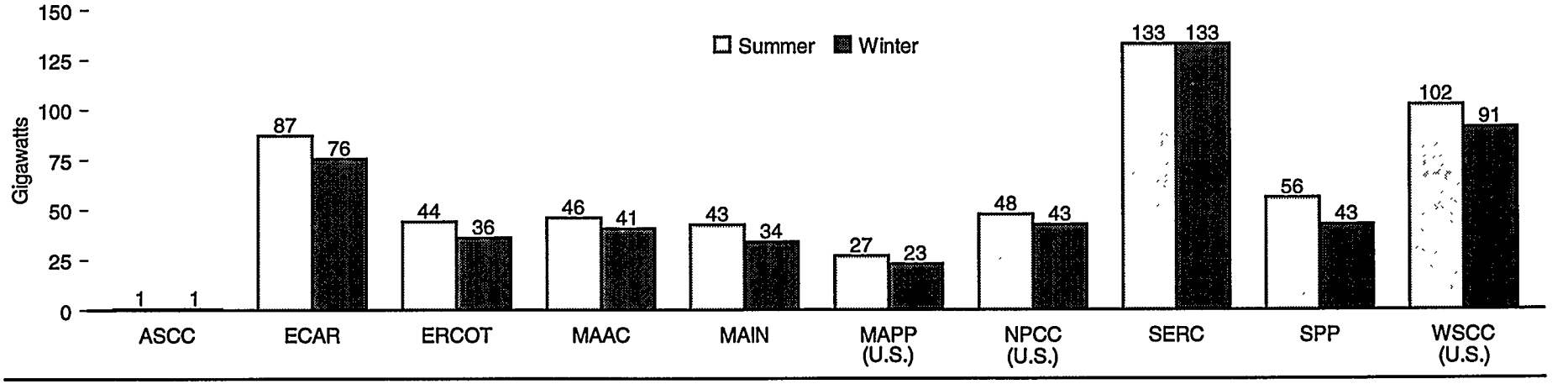
### In the Contiguous United States, 1986-1994




### North American Electric Reliability Council Map for the United States




### By NERC Regions, 1994




Notes: • Noncoincidental peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval. See Glossary for information on North American Electric Reliability Council (NERC). • Because vertical scales differ, graphs should not be compared.

Source: Table 8.9.

# Table 8.9 Electric Utility Noncoincidental Peak Load by Region, 1986-1994

(Megawatts)

| Year | North American Electric Reliability Council Regions [1] | | | | | | | | | Contiguous United States | ASCC (Alaska) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ECAR | ERCOT | MAAC | MAIN | MAPP (U.S.) | NPCC (U.S.) | SERC | SPP | WSCC (U.S.) | | |
| | Summer | | | | | | | | | | |
| 1986 | 69,606 | 39,335 | 37,564 | 35,943 | 21,029 | 39,026 | 105,570 | 47,123 | 81,787 | 476,983 | (2) |
| 1987 | 72,561 | 39,339 | 40,526 | 37,446 | 23,162 | 42,651 | 109,798 | 47,723 | 82,967 | 496,173 | (2) |
| 1988 | 79,149 | 40,843 | 43,110 | 41,139 | 24,899 | 45,245 | 115,168 | 49,356 | 90,551 | 529,460 | (2) |
| 1989 | 75,442 | 40,402 | 41,614 | 39,460 | 23,531 | 45,031 | 117,051 | 49,439 | 90,657 | 522,627 | 455 |
| 1990 | 79,258 | 42,737 | 42,613 | 40,740 | 24,994 | 44,116 | 121,149 | 52,541 | 97,389 | 545,537 | 463 |
| 1991 | 81,539 | 41,870 | 45,937 | 41,598 | 25,498 | 46,594 | 124,688 | 51,885 | 92,096 | 551,705 | 471 |
| 1992 | 78,550 | 42,619 | 43,658 | 38,819 | 22,638 | 43,658 | 128,236 | 51,324 | 99,205 | 548,707 | 504 |
| 1993 | 85,930 | 44,255 | 46,494 | 41,956 | 24,396 | 46,706 | 136,101 | 57,106 | 97,809 | 580,753 | 511 |
| 1994 | 87,165 | 44,162 | 46,019 | 42,562 | 27,000 | 47,581 | 132,584 | 56,035 | 102,212 | 585,320 | 524 |
| | Winter | | | | | | | | | | |
| 1986 | 64,561 | 28,730 | 32,807 | 28,036 | 18,850 | 37,976 | 101,849 | 33,877 | 76,171 | 422,857 | (2) |
| 1987 | 68,118 | 31,399 | 35,775 | 30,606 | 19,335 | 41,902 | 105,476 | 34,472 | 81,182 | 448,265 | (2) |
| 1988 | 67,771 | 34,621 | 36,363 | 30,631 | 20,162 | 42,951 | 108,649 | 35,649 | 82,937 | 459,734 | 0 |
| 1989 | 73,080 | 38,388 | 38,161 | 33,770 | 20,699 | 42,588 | 121,995 | 42,268 | 84,768 | 495,717 | 626 |
| 1990 | 67,097 | 35,815 | 36,551 | 32,461 | 21,113 | 40,545 | 117,231 | 38,949 | 94,252 | 484,014 | 613 |
| 1991 | 71,181 | 35,448 | 37,983 | 33,420 | 21,432 | 41,786 | 119,575 | 38,759 | 86,097 | 485,681 | 622 |
| 1992 | 72,885 | 35,055 | 37,915 | 31,289 | 21,866 | 41,125 | 121,250 | 39,912 | 91,686 | 492,983 | 635 |
| 1993 | 81,846 | 35,407 | 41,406 | 34,966 | 21,955 | 42,063 | 133,635 | 41,644 | 88,811 | 521,733 | 632 |
| 1994 | 75,638 | 36,180 | 40,653 | 33,999 | 23,033 | 42,547 | 132,661 | 42,505 | 91,037 | 518,253 | 641 |

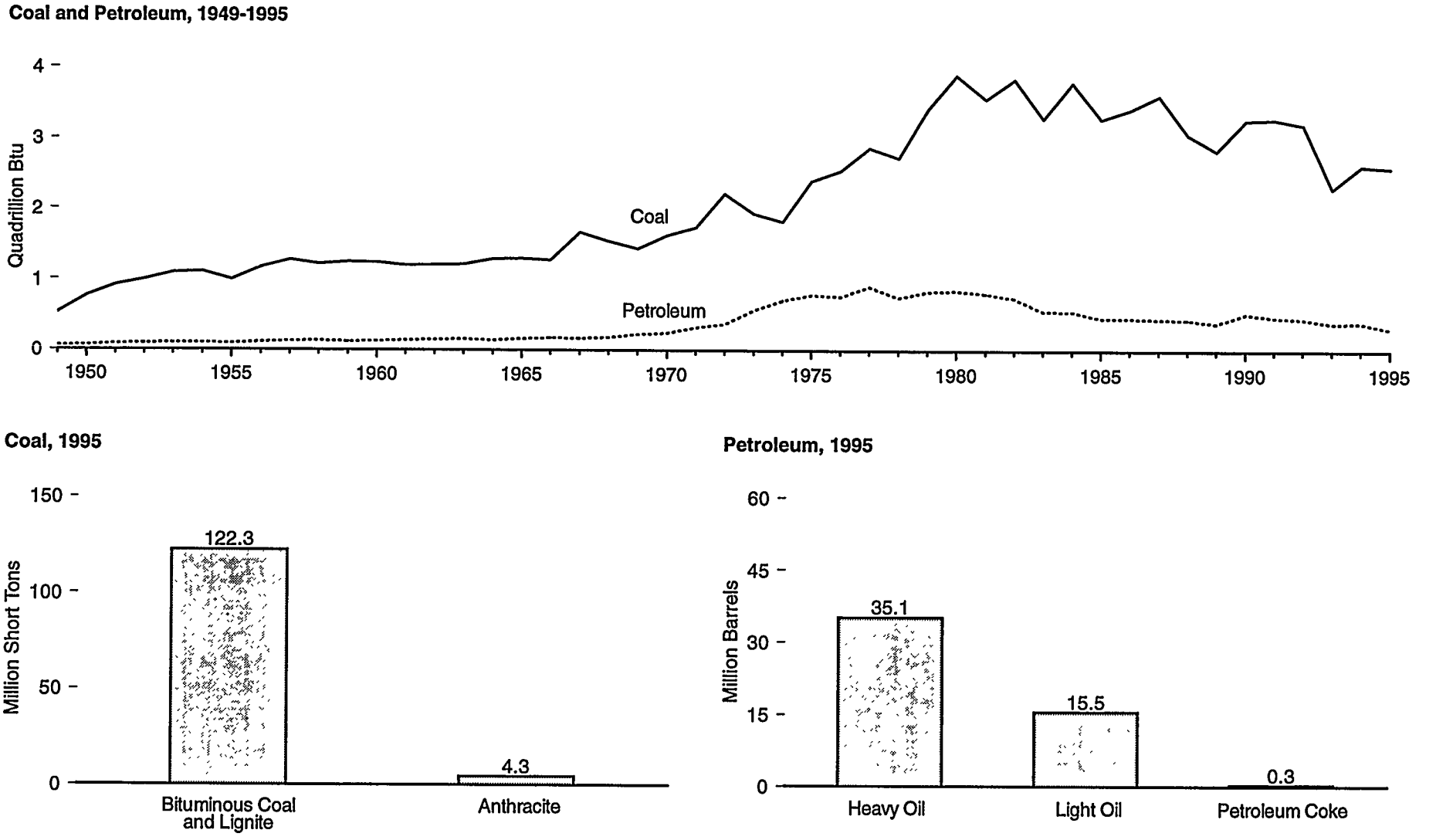
[1] See Glossary for information on the North American Electric Reliability Council (NERC). This table includes the U.S. portion of NERC only and does not cover Hawaii, Puerto Rico, and U.S. Trust Territories. See Figure 8.9 for an illustration of NERC regions.

[2] Data submission for ASCC (Alaska) began in 1989.

Note: Noncoincidental peak load is the sum of two or more peak loads on individual systems that do not occur at the same time interval.

Sources: • 1986—Energy Information Administration (EIA), *Electric Power Annual 1990* (January 1992), Table 53. • 1987—EIA, *Electric Power Annual 1991* (February 1993), Table 52. • 1988—EIA, *Electric Power Annual 1992* (January 1994), Table 57. • 1989—EIA, *Electric Power Annual 1993* (December 1994), Table 57. • 1990 forward—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 35.

## Figure 8.10 Electric Utility Stocks of Coal and Petroleum, End of Year




Source: Table 8.10.

# Table 8.10 Electric Utility Stocks of Coal and Petroleum, End of Year 1949-1995

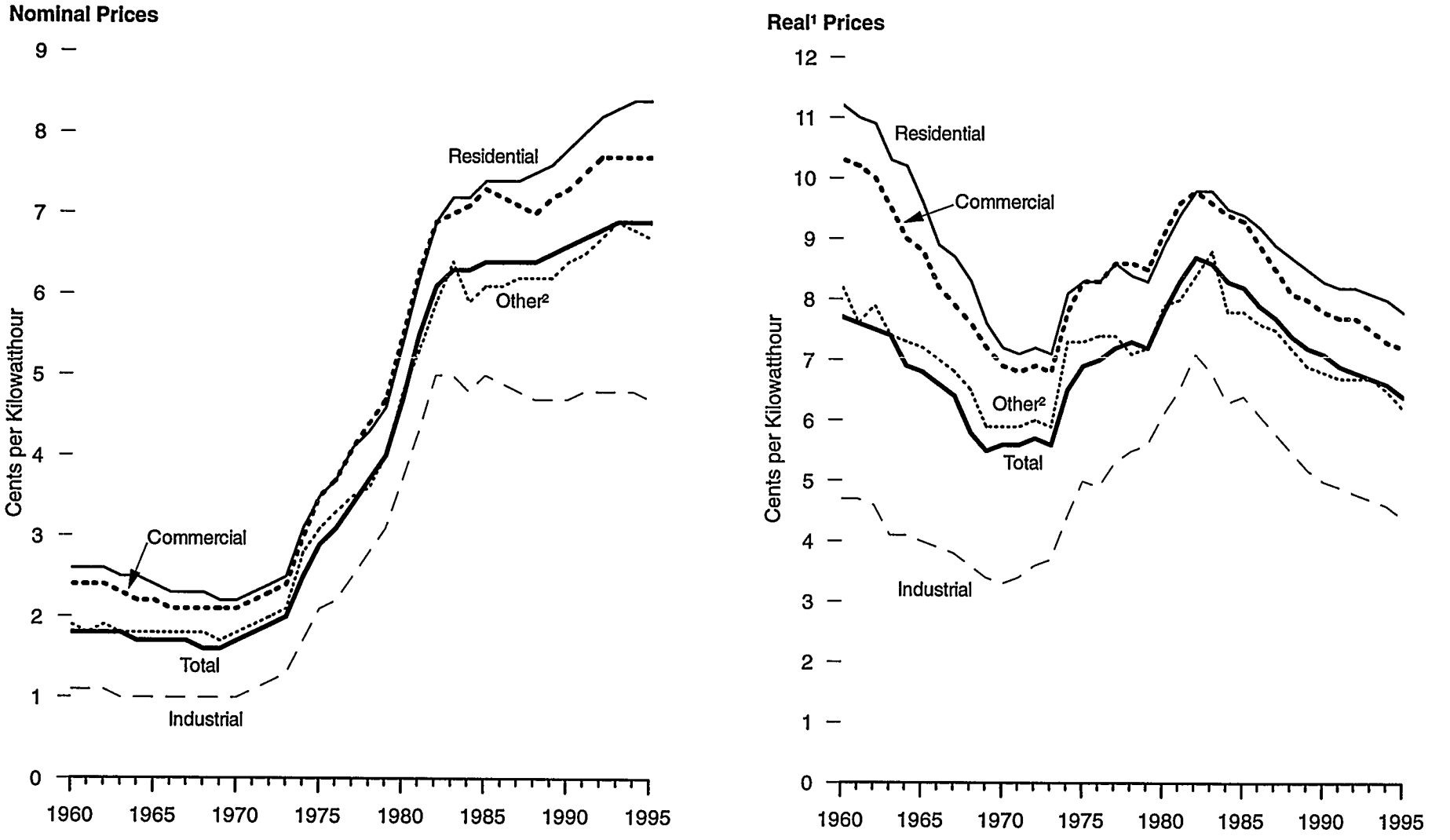
| Year | Coal | | | | Petroleum | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Anthracite [1] | Bituminous Coal [2] and Lignite | Total | | Heavy Oil [3] | Light Oil [4] | Total Liquids | Petroleum Coke [5] | Total | |
| | Million Short Tons | | Million Short Tons | Trillion Btu | Million Barrels | | | | Million Barrels | Trillion Btu |
| 1949 | 4.3 | 17.8 | 22.1 | 524 | NA | NA | 8.6 | NA | 8.6 | 54 |
| 1950 | 4.7 | 27.1 | 31.8 | 762 | NA | NA | 10.2 | NA | 10.2 | 64 |
| 1951 | 5.1 | 33.4 | 38.5 | 913 | NA | NA | 12.8 | NA | 12.8 | 80 |
| 1952 | 5.6 | 35.9 | 41.5 | 991 | NA | NA | 13.7 | NA | 13.7 | 86 |
| 1953 | 5.9 | 39.8 | 45.6 | 1,094 | NA | NA | 15.0 | NA | 15.0 | 94 |
| 1954 | 6.4 | 39.7 | 46.1 | 1,106 | NA | NA | 15.9 | NA | 15.9 | 99 |
| 1955 | 3.2 | 38.2 | 41.4 | 996 | NA | NA | 13.7 | NA | 13.7 | 85 |
| 1956 | 2.8 | 46.0 | 48.8 | 1,168 | NA | NA | 17.3 | NA | 17.3 | 108 |
| 1957 | 2.8 | 50.3 | 53.1 | 1,273 | NA | NA | 20.1 | NA | 20.1 | 126 |
| 1958 | 2.2 | 48.8 | 51.0 | 1,218 | NA | NA | 20.8 | NA | 20.8 | 130 |
| 1959 | 2.0 | 50.1 | 52.1 | 1,247 | NA | NA | 18.5 | NA | 18.5 | 116 |
| 1960 | 1.8 | 49.9 | 51.7 | 1,238 | NA | NA | 19.6 | NA | 19.6 | 123 |
| 1961 | 1.5 | 48.6 | 50.1 | 1,197 | NA | NA | 22.0 | NA | 22.0 | 138 |
| 1962 | 1.4 | 49.0 | 50.4 | 1,205 | NA | NA | 23.8 | NA | 23.8 | 149 |
| 1963 | 1.3 | 49.3 | 50.6 | 1,209 | NA | NA | 24.9 | NA | 24.9 | 156 |
| 1964 | 1.2 | 52.7 | 53.9 | 1,286 | NA | NA | 22.4 | NA | 22.4 | 140 |
| 1965 | 1.1 | 53.4 | 54.5 | 1,297 | NA | NA | 25.6 | NA | 25.6 | 161 |
| 1966 | 1.0 | 52.9 | 53.9 | 1,274 | NA | NA | 27.4 | NA | 27.4 | 172 |
| 1967 | 1.3 | 69.7 | 71.0 | 1,669 | NA | NA | 26.7 | NA | 26.7 | 167 |
| 1968 | 1.3 | 64.2 | 65.5 | 1,538 | NA | NA | 28.7 | NA | 28.7 | 180 |
| 1969 | 1.3 | 60.6 | 61.9 | 1,438 | NA | NA | 35.3 | NA | 35.3 | 221 |
| 1970 | 1.1 | 70.8 | 71.9 | 1,623 | NA | NA | 38.0 | 1.2 | 39.2 | 245 |
| 1971 | 1.1 | 76.7 | 77.8 | 1,735 | NA | NA | 49.6 | 1.5 | 51.1 | 319 |
| 1972* | 0.9 | 98.8 | 99.7 | 2,214 | NA | NA | 57.7 | 1.4 | 59.1 | 368 |
| 1973 | 1.1 | 85.9 | 87.0 | 1,935 | NA | NA | 89.2 | 1.6 | 90.8 | 567 |
| 1974 | 0.9 | 82.6 | 83.5 | 1,819 | NA | NA | 112.9 | 0.2 | 113.1 | 705 |
| 1975 | 1.0 | 109.7 | 110.7 | 2,396 | NA | NA | 125.3 | 0.2 | 125.4 | 784 |
| 1976 | 1.0 | 116.4 | 117.4 | 2,546 | NA | NA | 121.7 | 0.2 | 121.9 | 762 |
| 1977 | 2.3 | 130.9 | 133.2 | 2,865 | NA | NA | 144.0 | 0.2 | 144.3 | 901 |
| 1978 | 2.2 | 126.0 | 128.2 | 2,728 | NA | NA | 118.8 | 1.0 | 119.8 | 749 |
| 1979 | 3.3 | 156.4 | 159.7 | 3,412 | NA | NA | 131.4 | 0.9 | 132.3 | 828 |
| 1980 | 4.7 | 178.3 | 183.0 | 3,897 | 105.4 | 30.0 | 135.4 | 0.3 | 135.6 | 848 |
| 1981 | 5.5 | 163.4 | 168.9 | 3,561 | 102.0 | 26.1 | 128.1 | 0.2 | 128.3 | 803 |
| 1982 | 6.1 | 175.1 | 181.1 | 3,839 | 95.5 | 23.4 | 118.9 | 0.2 | 119.1 | 745 |
| 1983 | 6.5 | 149.1 | 155.6 | 3,288 | 70.6 | 18.8 | 89.4 | 0.3 | 89.7 | 561 |
| 1984 | 6.7 | 173.0 | 179.7 | 3,792 | 68.5 | 19.1 | 87.6 | 0.3 | 87.9 | 549 |
| 1985 | 7.2 | 149.2 | 156.4 | 3,277 | 57.3 | 16.4 | 73.7 | 0.2 | 73.9 | 462 |
| 1986 | 7.1 | 154.7 | 161.8 | 3,412 | 56.8 | 16.3 | 73.1 | 0.2 | 73.3 | 459 |
| 1987 | 6.9 | 163.9 | 170.8 | 3,610 | 55.1 | 15.8 | 70.8 | 0.3 | 71.1 | 444 |
| 1988 | 6.6 | 139.9 | 146.5 | 3,062 | 54.2 | 15.1 | 69.3 | 0.4 | 69.7 | 436 |
| 1989 | 6.4 | 129.5 | 135.9 | 2,832 | 47.4 | 13.8 | 61.3 | 0.5 | 61.8 | 386 |
| 1990 | 6.5 | 149.7 | 156.2 | 3,268 | 67.0 | 16.5 | 83.5 | 0.5 | 84.0 | 525 |
| 1991 | 6.5 | 151.4 | 157.9 | 3,277 | 58.6 | 16.4 | 75.0 | 0.4 | 75.3 | 471 |
| 1992 | 6.2 | 147.9 | 154.1 | 3,204 | 56.1 | 15.7 | 71.8 | 0.3 | 72.2 | 451 |
| 1993 | 5.6 | 105.7 | 111.3 | 2,298 | 46.8 | 15.7 | 62.4 | 0.4 | 62.9 | 392 |
| 1994 | 4.9 | R122.0 | R126.9 | R2,623 | 46.3 | R16.6 | R63.0 | 0.3 | R63.3 | R395 |
| 1995P | 4.3 | 122.3 | 126.6 | 2,596 | 35.1 | 15.5 | 50.6 | 0.3 | 50.9 | 316 |

[1] Includes anthracite silt stored off-site.
[2] Includes subbituminous coal.
[3] Includes Grade Nos. 4, 5, and 6, and residual fuel oils.
[4] Includes Grade No. 2 heating oil, kerosene, and jet fuel.
[5] Petroleum coke, which is reported in short tons, has been converted to barrels at a rate of 5 barrels per short ton.
R=Revised data. P=Preliminary data. NA=Not available.

Notes: • See Note 3 at end of section. • Totals may not equal sum of components due to independent rounding.

Sources: • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration, Form EIA-759, "Monthly Power Plant Report."

## Figure 8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1995




¹ In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

² "Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 8.11.

# Table 8.11 Retail Prices of Electricity Sold by Electric Utilities, 1960-1995

(Cents per Kilowatthour)

| Year | Residential | | Commercial | | Industrial | | Other [1] | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] | Nominal | Real [2] |
| 1960 | 2.6 | R11.2 | 2.4 | R10.3 | 1.1 | R4.7 | 1.9 | R8.2 | 1.8 | R7.7 |
| 1961 | 2.6 | R11.0 | 2.4 | R10.2 | 1.1 | R4.7 | 1.8 | R7.6 | 1.8 | R7.6 |
| 1962 | 2.6 | R10.9 | 2.4 | R10.0 | 1.1 | R4.6 | 1.9 | R7.9 | 1.8 | R7.5 |
| 1963 | 2.5 | R10.3 | 2.3 | R9.5 | 1.0 | R4.1 | 1.8 | R7.4 | 1.8 | R7.4 |
| 1964 | 2.5 | R10.2 | 2.2 | R9.0 | 1.0 | R4.1 | 1.8 | R7.3 | 1.7 | R6.9 |
| 1965 | 2.4 | R9.6 | 2.2 | R8.8 | 1.0 | R4.0 | 1.8 | R7.2 | 1.7 | R6.8 |
| 1966 | 2.3 | R8.9 | 2.1 | R8.2 | 1.0 | R3.9 | 1.8 | R7.0 | 1.7 | R6.6 |
| 1967 | 2.3 | R8.7 | 2.1 | R7.9 | 1.0 | R3.8 | 1.8 | R6.8 | 1.7 | R6.4 |
| 1968 | 2.3 | R8.3 | 2.1 | R7.6 | 1.0 | R3.6 | 1.8 | R6.5 | 1.6 | R5.8 |
| 1969 | 2.2 | R7.6 | 2.1 | R7.2 | 1.0 | R3.4 | 1.7 | R5.9 | 1.6 | R5.5 |
| 1970 | 2.2 | R7.2 | 2.1 | R6.9 | 1.0 | R3.3 | 1.8 | R5.9 | 1.7 | R5.6 |
| 1971 | 2.3 | R7.1 | 2.2 | R6.8 | 1.1 | R3.4 | 1.9 | R5.9 | 1.8 | R5.6 |
| 1972 | 2.4 | R7.2 | 2.3 | R6.9 | 1.2 | R3.6 | 2.0 | R6.0 | 1.9 | R5.7 |
| 1973 | 2.5 | R7.1 | 2.4 | R6.8 | 1.3 | R3.7 | 2.1 | R5.9 | 2.0 | R5.6 |
| 1974 | 3.1 | R8.1 | 3.0 | R7.8 | 1.7 | R4.4 | 2.8 | R7.3 | 2.5 | R6.5 |
| 1975 | 3.5 | R8.3 | 3.5 | R8.3 | 2.1 | R5.0 | 3.1 | R7.3 | 2.9 | R6.9 |
| 1976 | 3.7 | R8.3 | 3.7 | R8.3 | 2.2 | R4.9 | 3.3 | R7.4 | 3.1 | R7.0 |
| 1977 | 4.1 | R8.6 | 4.1 | R8.6 | 2.5 | R5.3 | 3.5 | R7.4 | 3.4 | R7.2 |
| 1978 | 4.3 | R8.4 | 4.4 | R8.6 | 2.8 | R5.5 | 3.6 | R7.1 | 3.7 | R7.3 |
| 1979 | 4.6 | R8.3 | 4.7 | R8.5 | 3.1 | R5.6 | 4.0 | R7.2 | 4.0 | R7.2 |
| 1980 | 5.4 | R8.9 | 5.5 | R9.1 | 3.7 | R6.1 | 4.8 | R7.9 | 4.7 | R7.8 |
| 1981 | 6.2 | R9.4 | 6.3 | R9.6 | 4.3 | R6.5 | 5.3 | R8.0 | 5.5 | R8.3 |
| 1982 | 6.9 | R9.8 | 6.9 | R9.8 | 5.0 | R7.1 | 5.9 | R8.4 | 6.1 | R8.7 |
| 1983 | 7.2 | R9.8 | 7.0 | R9.6 | 5.0 | R6.8 | 6.4 | R8.8 | 6.3 | R8.6 |
| 1984[3] | 7.2 | R9.5 | 7.1 | R9.4 | 4.8 | R6.3 | 5.9 | R7.8 | 6.3 | R8.3 |
| 1985[3] | 7.4 | R9.4 | 7.3 | R9.3 | 5.0 | R6.4 | 6.1 | R7.8 | 6.4 | R8.2 |
| 1986[3] | 7.4 | R9.2 | 7.2 | R8.9 | 4.9 | R6.1 | 6.1 | R7.6 | 6.4 | R7.9 |
| 1987[3] | 7.4 | R8.9 | 7.1 | R8.5 | 4.8 | R5.8 | 6.2 | R7.5 | 6.4 | R7.7 |
| 1988 | 7.5 | R8.7 | 7.0 | R8.1 | 4.7 | R5.5 | 6.2 | R7.2 | 6.4 | R7.4 |
| 1989 | 7.6 | R8.5 | 7.2 | R8.0 | 4.7 | R5.2 | 6.2 | R6.9 | 6.5 | R7.2 |
| 1990 | 7.8 | R8.3 | 7.3 | R7.8 | 4.7 | R5.0 | 6.4 | R6.8 | 6.6 | R7.1 |
| 1991 | 8.0 | R8.2 | 7.5 | R7.7 | 4.8 | R4.9 | 6.5 | R6.7 | 6.7 | R6.9 |
| 1992 | 8.2 | R8.2 | 7.7 | R7.7 | 4.8 | R4.8 | 6.7 | R6.7 | 6.8 | R6.8 |
| 1993 | 8.3 | R8.1 | 7.7 | R7.5 | 4.8 | R4.7 | 6.9 | R6.7 | 6.9 | R6.7 |
| 1994 | 8.4 | R8.0 | R7.7 | R7.3 | R4.8 | R4.6 | 6.8 | R6.5 | 6.9 | R6.6 |
| 1995[P] | 8.4 | 7.8 | 7.7 | 7.2 | 4.7 | 4.4 | 6.7 | 6.2 | 6.9 | 6.4 |

[1] "Other" is public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales.

[2] In chained (1992) dollars, calculated by using gross domestic product implicit price deflators. See Appendix E.

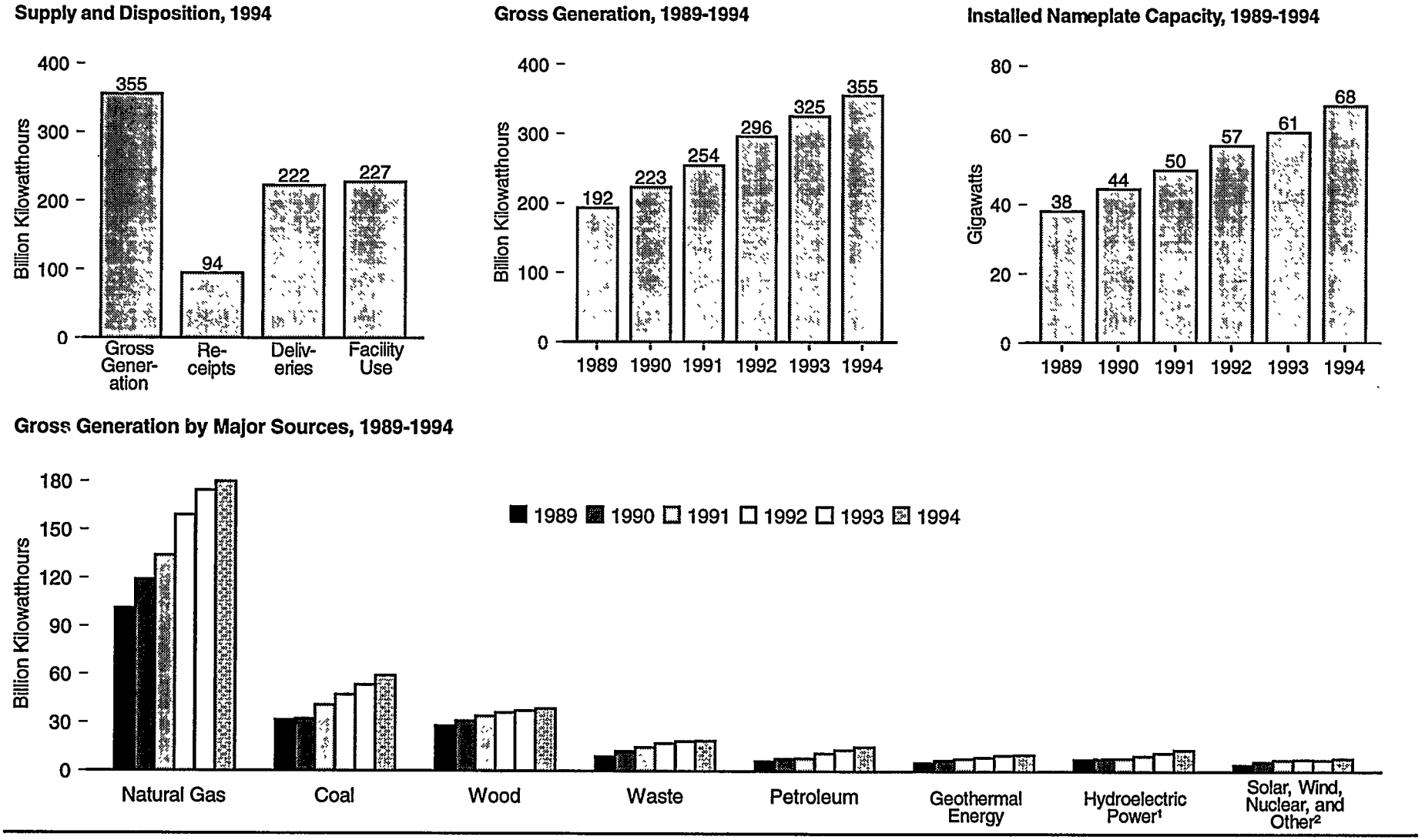
[3] These data were taken from Form EIA-861, "Annual Electric Utility Report," and differ from the Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions," data published in previous issues of this publication.

R=Revised data. P=Preliminary data.

Note: Data for 1979 and earlier data are for Classes A and B privately owned electric utilities only. Data for 1980 forward are for selected Class A utilities whose electric operating revenues were $100 million or more during the previous year.

Sources: • 1960 through September 1977—Federal Power Commission, Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • October 1977 through February 1980—Federal Energy Regulatory Commission (FERC), Form FPC-5, "Monthly Statement of Electric Operating Revenues and Income." • March 1980 through 1982—FERC, Form FERC-5, "Electric Utility Company Monthly Statement." • 1983—Energy Information Administration (EIA), Form EIA-826, "Electric Utility Company Monthly Statement." • 1984-1994—EIA, Form EIA-861, "Annual Electric Utility Report." • 1995—EIA, Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions."

# Figure 8.12 Nonutility Power Overview, 1989-1994




[1] Conventional hydroelectric only; there are no pumped-storage projects in the nonutility sector.

[2] "Other" includes hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • See Table 8.12 for description of fuels. • Because vertical scales differ, graphs should not be compared.

Source: Table: 8.12.

# Table 8.12 Nonutility Power Overview, 1989-1994

| Item | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| **Supply and Disposition** (million kilowatthours) | | | | | | |
| Gross Generation | 192,327 | 222,721 | 254,255 | 296,001 | 325,226 | 354,925 |
| Receipts [1] | 63,249 | 70,154 | 73,583 | 83,421 | 85,323 | 94,166 |
| Deliveries to Utilities [2] | NA | NA | NA | NA | 187,466 | 204,688 |
| Deliveries to Other End Users [3] | NA | NA | NA | NA | 15,569 | 17,626 |
| Facility Use | 152,354 | 163,946 | 183,698 | 204,261 | 207,514 | 226,777 |
| **Consumption** | | | | | | |
| Coal (thousand short tons) | NA | NA | NA | NA | 48,343 | 52,261 |
| Petroleum [4] (thousand barrels) | NA | NA | NA | NA | 36,768 | 40,460 |
| Natural Gas (million cubic feet) | NA | NA | NA | NA | 2,013,788 | 2,149,246 |
| Other Gas [5] (million cubic feet) | NA | NA | NA | NA | 1,678,166 | 1,586,185 |
| **Gross Generation** (million kilowatthours) | **192,327** | **222,721** | **254,255** | **296,001** | **325,226** | **354,925** |
| Coal [6] | 31,703 | 32,323 | 40,773 | 47,363 | 53,367 | 59,035 |
| Petroleum [7] | 5,972 | 7,584 | 8,083 | 10,963 | 13,364 | 15,069 |
| Natural Gas [8] | 100,813 | 118,844 | 133,670 | 158,798 | 174,282 | 179,735 |
| Other Gas [5] | NA | NA | NA | NA | NA | 12,480 |
| Hydroelectric Power [9] | 7,504 | 7,960 | 8,007 | 9,446 | 11,511 | 13,227 |
| Geothermal Energy | 5,091 | 6,916 | 7,695 | 8,578 | 9,749 | 10,122 |
| Wood [10] | 28,051 | 31,038 | 34,011 | 36,255 | 37,421 | 38,595 |
| Waste [11] | 9,015 | 12,259 | 14,886 | 17,352 | 18,325 | 18,797 |
| Solar | 489 | 663 | 779 | 746 | 897 | 824 |
| Wind | 1,877 | 2,295 | 2,650 | 2,916 | 3,052 | 3,482 |
| Nuclear [12] | 49 | 116 | 80 | 67 | 78 | 54 |
| Other [13] | 1,763 | 2,723 | 3,621 | 3,516 | 3,181 | 3,507 |
| **Installed Nameplate Capacity** [14] (megawatts) | **37,984** | **44,352** | **49,736** | **56,814** | **60,778** | **68,461** |
| Coal [6] | 6,284 | 6,768 | 7,349 | 8,503 | 9,772 | 10,372 |
| Petroleum [7] | 1,030 | 946 | 1,351 | 1,730 | 2,043 | 2,262 |
| Natural Gas [8] | 14,349 | 17,063 | 20,669 | 21,542 | 23,463 | 26,925 |
| Other Gas [5] | NA | NA | NA | NA | NA | 1,130 |
| Petroleum and Natural Gas (dual fired) | 4,541 | 6,279 | 5,168 | 8,478 | 8,505 | 9,820 |
| Hydroelectric Power [9] | 1,848 | 1,991 | 2,118 | 2,684 | 2,741 | 3,364 |
| Geothermal Energy | 956 | 1,043 | 1,060 | 1,254 | 1,318 | 1,335 |
| Wood [10] | 5,321 | 5,854 | 6,648 | 6,805 | 7,046 | 7,416 |
| Waste [11] | 1,875 | 2,392 | 2,806 | 3,006 | 3,131 | 3,150 |
| Solar | 200 | 360 | 360 | 360 | 360 | 354 |
| Wind | 1,376 | 1,441 | 1,688 | 1,822 | 1,813 | 1,737 |
| Nuclear [12] | 20 | 20 | 20 | 20 | 20 | 0 |
| Other [13] | 184 | 195 | 499 | 611 | 566 | 597 |

[1] Purchases, interchanges, and exchanges of electric energy with utilities and other nonutilities.

[2] Sales, interchanges, and exchanges of electric energy with utilities.

[3] Sales, interchanges, and exchanges of electric energy with other nonutilities. The disparity in these data and data reported on other EIA surveys occurs due to differences in the respondent universe. The Form EIA-867 is filed by nonutilities reporting the energy delivered, while other data sources are filed by electric utilities reporting energy received. Differences in terminology and accounting procedures contribute to the disparity. In addition, because the frame for the Form EIA-867 is derived from utility surveys, the Form EIA-867 universe lags 1 year.

[4] Does not include petroleum coke consumption of 4,740 thousand short tons for 1994.

[5] Butane, ethane, propane, and other gases.

[6] Coal, anthracite culm, and coal waste.

[7] Petroleum, petroleum coke, diesel, kerosene, petroleum sludge, and tar.

[8] Natural gas, butane, ethane, propane, waste heat, and waste gases.

[9] Conventional hydroelectric power only; there are no pumped-storage projects in the nonutility sector.

[10] Wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.

[11] Municipal solid waste, agricultural waste, straw, tires, landfill gases, and other waste.

[12] Nuclear reactor and generator at Argonne National Laboratory used primarily for research and development in testing reactor fuels as well as for training. The generation from the unit is used for internal consumption.

[13] Hydrogen, sulfur, batteries, chemicals, fish oil, and spent sulfite liquor. Data previously published for other energy sources in 1989 and 1990 have been reclassified and are included in the category that best reflects their characteristics.

[14] Installed nameplate capacity is the full-load continuous rating of a generator, prime mover, or other electrical equipment under specified conditions as designated by the manufacturer. It is usually indicated on a nameplate attached physically to the equipment. Installed station capacity does not include auxiliary or house units.

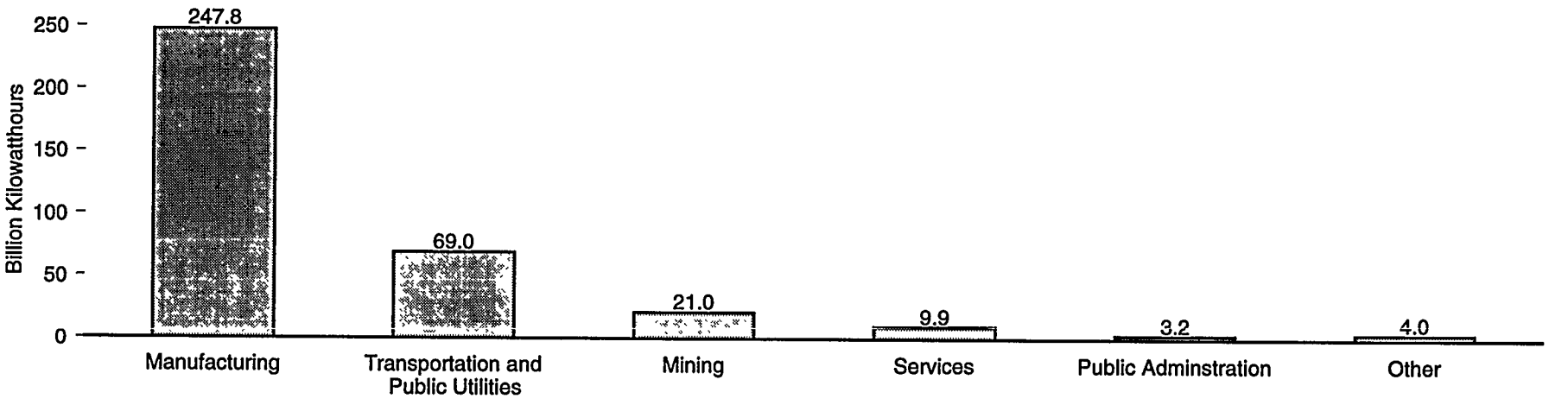
NA=Not available.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • Totals may not equal sum of components due to independent rounding.

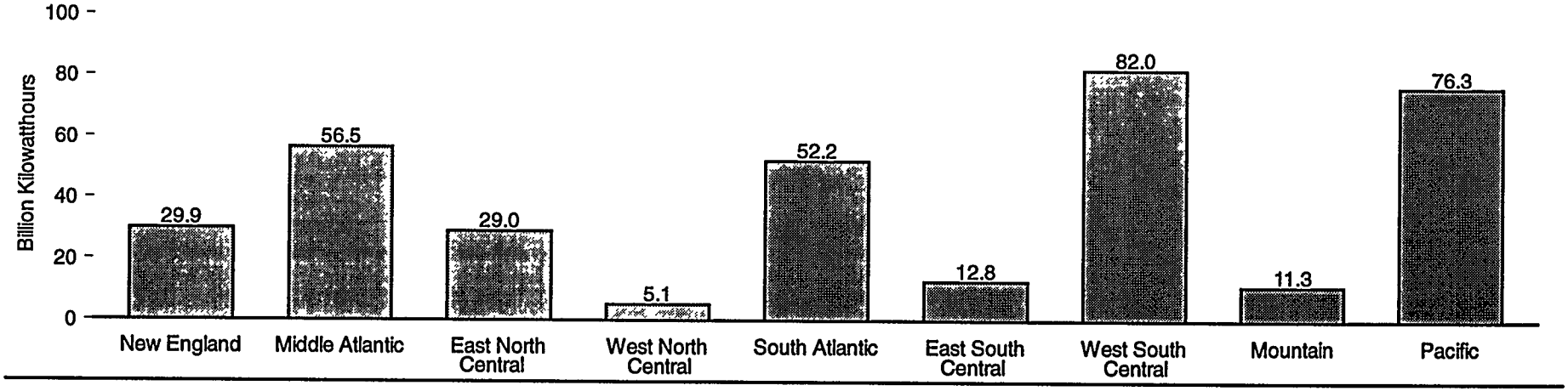
Sources: • 1989-1991—Estimated based on data collected from Form EIA-867, "Annual Nonutility Power Producer Report." See Note 6 at end of section for additional information. • 1992—Energy Information Administration (EIA), *Electric Power Annual 1993* (December 1994), Table 74. • 1993 and 1994—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 52.

## Figure 8.13 Nonutility Power Gross Generation, 1994

**By Producing Energy Group**




**By Census Divisions**




Notes: • Data are preliminary. • See Appendix F for Census divisions. • Because vertical scales differ, graphs should not be compared.

Source: Table 8.13.

# Table 8.13 Nonutility Power Gross Generation, 1994

(Million Kilowatthours)

| Division/Region | Manufacturing | Transportation and Public Utilities | Services | Mining | Public Administration | Other Industry Groups | Total |
|---|---|---|---|---|---|---|---|
| **Census Divisions** | | | | | | | |
| New England | 13,641 | 15,743 | W | — | — | W | 29,925 |
| Middle Atlantic | 37,382 | 12,009 | 3,385 | W | 1,452 | W | 56,457 |
| East North Central | 24,909 | 2,415 | 1,067 | W | W | 254 | 28,993 |
| West North Central | 3,150 | 434 | 421 | W | W | W | 5,077 |
| South Atlantic | 41,152 | 10,142 | 635 | W | W | W | 52,152 |
| East South Central | 12,478 | 81 | W | 148 | W | — | 12,786 |
| West South Central | 78,974 | 2,013 | 539 | 464 | — | — | 81,989 |
| Mountain | 5,096 | 3,173 | 954 | 563 | — | 1,486 | 11,273 |
| Pacific | 31,053 | 22,971 | 2,406 | 17,757 | 1,523 | 561 | 76,271 |
| **Total** | **247,836** | **68,982** | **9,900** | **21,024** | **3,172** | **4,011** | **354,925** |
| **North American Electric Reliability Council Regions [1]** | | | | | | | |
| ECAR | 24,612 | 3,499 | 1,219 | 0 | 15 | 48 | 29,393 |
| ERCOT | 46,980 | 587 | 405 | 232 | 0 | 0 | 48,204 |
| MAAC | 15,602 | 7,860 | 1,489 | 718 | 422 | 1,103 | 27,194 |
| MAIN | 7,014 | 470 | 440 | 315 | 18 | 206 | 8,463 |
| MAPP (U.S.) | 2,931 | 416 | 270 | 1,055 | 17 | 0 | 4,689 |
| NPCC (U.S.) | 34,349 | 20,126 | 2,382 | 0 | 1,044 | 547 | 58,448 |
| SERC | 47,276 | 8,442 | 174 | 153 | 132 | 130 | 56,307 |
| SPP | 32,850 | 1,439 | 144 | 180 | 0 | 0 | 34,613 |
| WSCC (U.S.) | 32,366 | 25,484 | 3,322 | 17,838 | 1,347 | 1,868 | 82,225 |
| **Contiguous United States** | **243,980** | **68,323** | **9,845** | **20,491** | **2,995** | **3,902** | **349,536** |
| ASCC (Alaska) | 480 | 4 | 55 | 533 | 177 | 13 | 1,262 |
| Hawaii | 3,376 | 655 | 0 | 0 | 0 | 97 | 4,128 |
| **Total** | **247,836** | **68,982** | **9,900** | **21,024** | **3,172** | **4,011** | **354,925** |

[1] See Glossary for information on the North American Electric Reliability Council (NERC). This table includes the U.S. portion of NERC only and does not cover Puerto Rico and U.S. Trust Territories. See Figure 8.9 for an illustration of NERC regions.

— = Not applicable. W=Withheld to avoid disclosure of individual company data.

Notes: • Nonutility electric generating facilities with a total generator capacity of 1 megawatt or greater. • Data are based on facilities' consumption. • Totals may not equal sum of components due to independent rounding.

Sources: **Census Divisions:** Energy Information Administration (EIA), *Electric Power Annual 1994*, Volume II, (December 1995), Table C2. **NERC Regions:** EIA, Form EIA-867, "Annual Nonutility Power Producer Report."

## Electricity Notes

1. Electrical system energy losses are estimated as the difference between total energy input at electric utilities and the total energy content of electricity sold to end-use consumers. Most of these losses occur at steam-electric power plants (conventional and nuclear) in the conversion of heat energy into mechanical energy to turn electric generators. This loss is a thermodynamically necessary feature of the steam-electric cycle. Part of the energy input-to-output losses is a result of imputing fossil energy equivalent inputs for hydroelectric and other energy sources, since there is no generally accepted practice for measuring these thermal conversion rates. In addition to conversion losses, other losses include power plant use of electricity, transmission and distribution of electricity from power plants to end-use consumers (also called "line-losses"), and unaccounted-for electricity. Total losses are allocated to the end-use sectors in proportion to each sector's share of total electricity sales. Overall, approximately 67 percent of total energy input is lost in conversion; of electricity generated, approximately 5 percent is lost in plant use and 9 percent is lost in transmission and distribution. Calculated electrical energy system losses may be less than actual losses, because primary consumption does not include the energy equivalent of utility purchases of electricity from non-electric utilities and from Canada and Mexico, although they are included in electricity sales.

2. Data on the generation of electricity in the United States represent net generation, which is gross output of electricity (measured at the generator terminals) minus power plant use. Nuclear electricity generation data identified by individual countries in Section 11 are gross output of electricity.

3. Prior to 1985, electric utility supply and distribution statistics included data reported by institutions (such as universities) and military facilities that generated electricity primarily for their own use. Beginning in 1985, electricity statistics exclude data for these facilities and include data only for those organizations that generate electricity primarily for public use. In 1989, data for nonutility power producers (cogenerators, small power producers, and independent power producers) are provided.

4. Data on the sales of electric utility electricity represent gross output of electricity (measured at the generator terminals) minus power plant use and transmission and distribution losses. Included in each end-use sector are the following: Commercial Sector—sales of electricity to businesses that generally require less than 1,000 kilowatts of service; Industrial Sector—sales of electricity to businesses that generally require more than 1,000 kilowatts of service; Residential Sector—sales of electricity to residences for household purposes; "Other" Sector—sales of electricity for public street and highway lighting, to public authorities, railways, and railroads, and interdepartmental sales.

5. Net summer capabilities were first collected on Form EIA-860, "Annual Electric Generator Report," for 1984. Units not assigned a net summer capability rating by the utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capability for each prime mover. To estimate net summer capability for the years 1949 through 1984, two methods were used. For each prime mover except nuclear and "other," net summer capability estimates were calculated in two steps. First, the unit capacity values reported on Form EIA-860 and the unit start dates contained in the 1984 Generating Unit Reference File (GURF) were used to compute preliminary aggregate estimates of annual net summer capability and installed nameplate capacity. These preliminary estimates were obtained by aggregating unit capacity values for all units in service during a given year. Next, the ratio of the preliminary capability to nameplate estimate was computed for each year and multiplied by the previously published installed nameplate capacity values to produce the final estimates of net summer capability. The net summer capability data for nuclear and "other" units were used directly from the 1984 GURF for all years. Historical aggregates were then developed by using the unit start dates on the GURF.

Historical capacity has also been modified to estimate capability based upon the operable definition. This was accomplished by assuming that nonnuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used. It should be noted that net summer capabilities are not currently collected for nonutilities.

6. Year-to-year changes in data from the Form EIA-867, "Annual Nonutility Power Plant Report," can result from correcting misreported data and modifying the frame to account for new or retired facilities, among other improvements. Data for 1989, 1990, and 1991 were collected for facilities of 5 megawatts or more. In 1992, the threshold was lowered to include facilities with capacities of 1 megawatt or more. Estimates of the 1-to-5-megawatt range for prior years were derived from historical data. The estimation did not include retirements that occurred prior to 1992 and included only the capacity of facilities that came on line before 1992.

# 9. Nuclear Energy

## Status of Nuclear Generating Units

At the end of 1995, there were 109 licensed operable nuclear generating units and one unit (Watts Bar 1) licensed for startup in the United States (9.1).* Most of the licensed units were located east of the Mississippi River. In addition to the licensed units, six units possessed construction permits; however, construction for all six units had been halted or canceled.

The number of units in all stages of planning, construction, and operation in 1995 was 116, well below the total of 226 in 1974. After 1974, many planned units were canceled; after 1977, no orders for new units were announced.

The Three Mile Island accident in 1979 greatly increased concerns about the safety of nuclear power plants. The regulatory reaction to those concerns contributed to the decline in the number of planned nuclear units. Longer leadtimes for licensing and construction, coupled with higher financing expenses, increased the cost of nuclear power plants. In addition, growth in electricity demand was slower than expected. The uncertain economic environment diminished electric utilities' willingness to commission new plants. For nuclear power to remain a viable option in the United States, significant changes will be required.

## Contributions to Electricity Net Generation

Nuclear electric power's contribution to electricity net generation in the United States increased almost every year from the late 1950's through 1995 (9.2). Nuclear electric power production in 1995 totaled 673 billion kilowatthours, up 5.2 percent from the 1994 level. The nuclear portion of domestic electricity net generation rose from 22.0 percent in 1994 to 22.5 percent in 1995, and the capacity factor[1] rose from 74 percent in 1994 to 78 percent in 1995.

[1]The actual generation in a given time period divided by the maximum possible generation in that time period.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

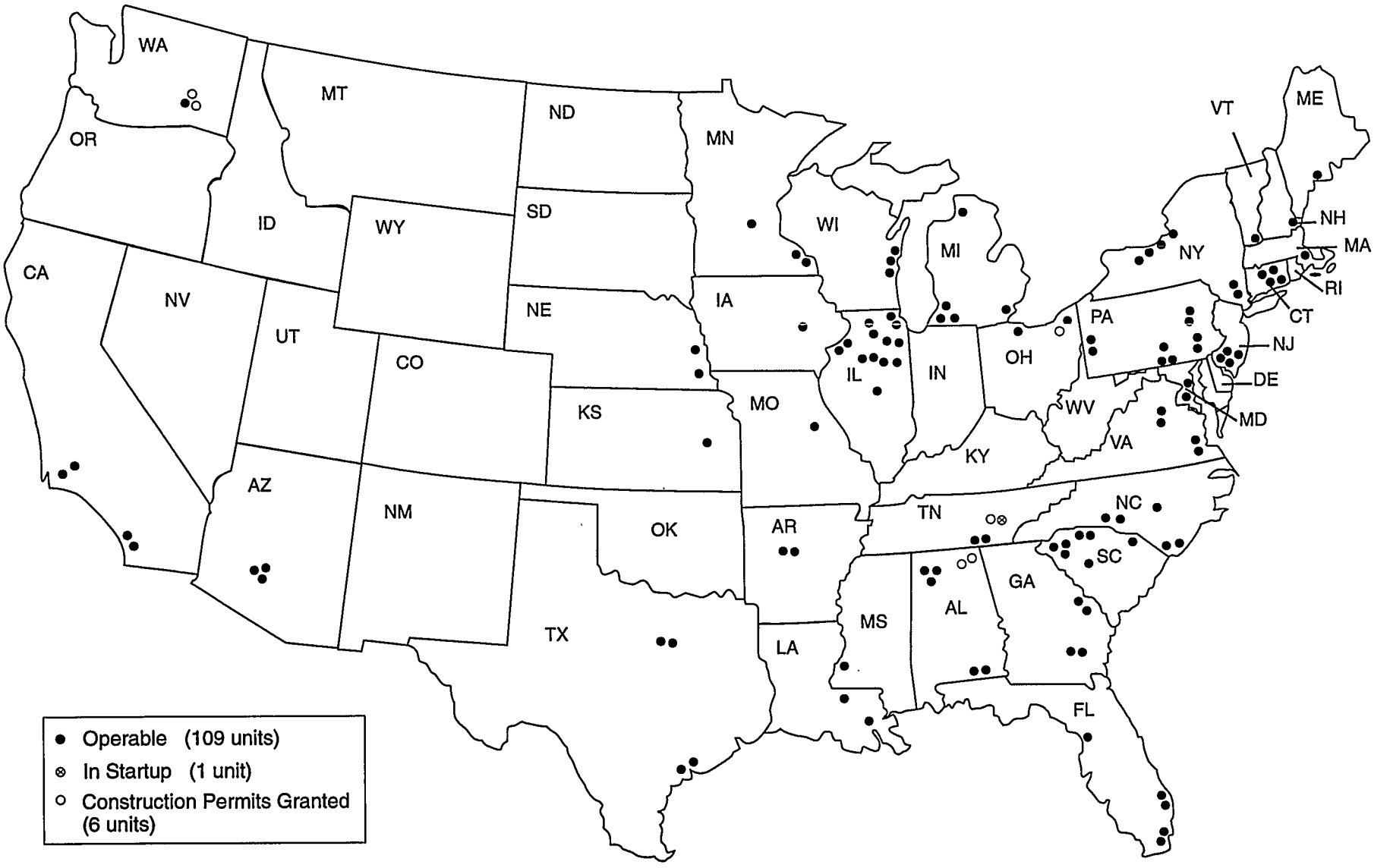
### The Uranium Industry

From 1949 through 1967, the Atomic Energy Commission (AEC) was the major purchaser of uranium. The AEC's demand for uranium for military purposes was strong during the 1950's and domestic production, spurred by AEC incentives, grew from 0.4 million pounds of uranium oxide ($U_3O_8$) in 1949 to 35 million pounds in 1960 (9.3). As the AEC began to accumulate stockpiles, its purchases declined and U.S. production fell to 21 million pounds in 1965. From 1966 through 1976, production fluctuated between 21 and 27 million pounds. Subsequently, orders for new nuclear plants led to strong growth, and production peaked at 44 million pounds in 1980.

However, plant cancellations and postponements during the late 1970's led to a decline in projected demand and, coupled with foreign competition and buildups of inventories at electric utilities, caused the second major decline in domestic uranium production, which fell to 11 million pounds in 1985. Many domestic uranium-producing facilities closed permanently. In the early 1990's, low uranium prices, excess world supply, and continuing low expectations for future uranium demand brought domestic uranium production to a 40-year low of 3.1 million pounds in 1993. In 1995, however, uranium production rose to 6.0 million pounds, partly as a result of higher uranium prices and the need among electric utilities and fuel suppliers to bolster inventories.

Historically, domestic producers have faced competition from low-cost uranium imports. From 1949 through 1960, net imports actually exceeded domestic production (9.3). In 1966, the AEC effectively suspended imports by curtailing enrichment services for foreign uranium intended for use in domestic facilities, and no uranium was imported from 1967 through 1974. With the gradual removal of the AEC restrictions during the 1977-to-1983 period, foreign uranium deliveries to the United States began to increase. In 1990 through 1995, net imports of $U_3O_8$ once again exceeded domestic production. For example, in 1995, net imports totaled an estimated 32 million pounds, compared with domestic production of 6.0 million pounds. The price of purchased imports averaged $10.20 per pound of $U_3O_8$, and the price of purchased domestic uranium averaged $11.11 per pound of $U_3O_8$.

## Figure 9.1 Nuclear Generating Units, December 31, 1995




Note: Due to space limitations, symbols do not represent actual locations.

Source: Energy Information Administration, *World Nuclear Outlook 1995* (October 1995), Appendices C and D.

# Table 9.1 Nuclear Generating Units, End of Year 1973-1995

| Year | Licensed for Operation | | Construction Permits | | On Order | Announced | Total | Total Design Capacity[3] |
|---|---|---|---|---|---|---|---|---|
| | Operable[1] | In Startup[2] | Granted | Pending | | | | |
| | Number of Units | | | | | | | Million Kilowatts |
| 1973 | 39 | 2 | 57 | 52 | 49 | 9 | 208 | 198 |
| 1974 | 48 | 5 | 62 | 75 | 30 | 6 | 226 | 223 |
| 1975 | 54 | 2 | 69 | 69 | 14 | 5 | 213 | 212 |
| 1976 | 61 | 1 | 71 | 63 | 16 | 2 | 214 | 211 |
| 1977 | 65 | 2 | 78 | 49 | 13 | 2 | 209 | 203 |
| 1978 | 70 | 0 | 88 | 32 | 5 | 0 | 195 | 191 |
| 1979 | 68 | 0 | 90 | 24 | 3 | 0 | 185 | 180 |
| 1980 | 70 | 1 | 82 | 12 | 3 | 0 | 168 | 162 |
| 1981 | 74 | 0 | 76 | 11 | 2 | 0 | 163 | 157 |
| 1982 | 77 | 2 | 60 | 3 | 2 | 0 | 144 | 134 |
| 1983 | 80 | 3 | 53 | 0 | 2 | 0 | 138 | 129 |
| 1984 | 86 | 6 | 38 | 0 | 2 | 0 | 132 | 123 |
| 1985 | 95 | 3 | 30 | 0 | 2 | 0 | 130 | 121 |
| 1986 | 100 | 7 | 19 | 0 | 2 | 0 | 128 | 119 |
| 1987 | 107 | 4 | 14 | 0 | 2 | 0 | 127 | 119 |
| 1988 | 108 | 3 | 12 | 0 | 0 | 0 | 123 | 115 |
| 1989 | 110 | 1 | 10 | 0 | 0 | 0 | 121 | 113 |
| 1990 | 111 | 0 | 8 | 0 | 0 | 0 | 119 | 111 |
| 1991 | 111 | 0 | 8 | 0 | 0 | 0 | 119 | 111 |
| 1992 | 109 | 0 | 8 | 0 | 0 | 0 | 117 | 111 |
| 1993 | 109 | 0 | 7 | 0 | 0 | 0 | 116 | 110 |
| 1994 | 109 | 0 | 7 | 0 | 0 | 0 | 116 | 110 |
| 1995 | 109 | 1 | 6 | 0 | 0 | 0 | 116 | 110 |

[1] Nuclear generating units that have been issued a full-power license by the Nuclear Regulatory Commission (NRC). See Note 1 at end of section for exceptions.

[2] The period of time between a nuclear generating unit's initial fuel loading date and the issuance of its full-power license. During that period, the unit is undergoing low-power testing and the maximum level of operation is 5 percent of the unit's design thermal rating.

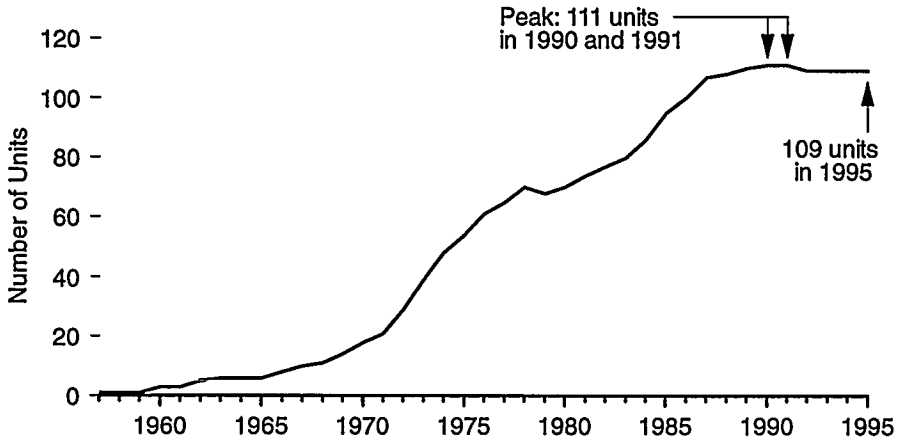
[3] Net design electrical rating (DER) is used because many of the units were canceled prior to being assigned a net summer capability. Nuclear generating units may have more than one type of net capacity rating, including the following: Net Summer Capability - The steady hourly output that generating equipment is expected to supply to system load, exclusive of auxiliary power, as demonstrated by test at the time of summer peak demand. Auxiliary power of a typical nuclear power plant is about 5 percent of gross generation. Net Design Capacity or DER - The nominal net electrical output of a unit, specified by the utility and used for plant design.

Note: Geographic coverage is the 50 States and the District of Columbia.

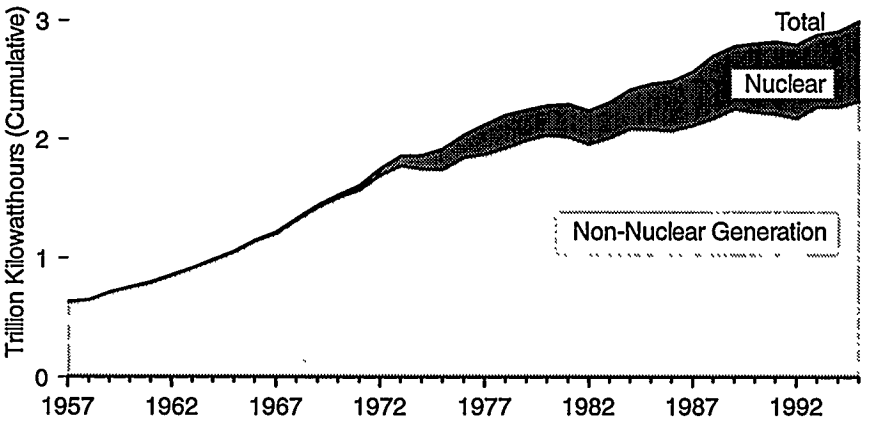
Sources: **Licensed for Operation:** • 1973-1982—U.S. Department of Energy (DOE), Office of Nuclear Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones." • 1983 forward—NRC, "Licensed Operating Reactors" (NUREG-0020). **Construction Permits, On Order, and Announced:** • 1973-1982—Compiled from various sources, primarily DOE, Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones"; Energy Information Administration (EIA), Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), "Nuclear Steam-Electric Units That Have Been in Operation as of 1957-1989"; EIA, CNEAF, "Nuclear Plant Cancellations: Causes, Costs, and Consequences"; and Utility Data Institute, Inc., "U.S. Nuclear Plant Statistics, 1987." • 1983 forward—NRC, "Summary Information Report" (NUREG-0871); NRC, "Licensed Operating Reactors" (NUREG-0020); and various journals. **Total Design Capacity:** • 1973-1982—Compiled from various sources, primarily DOE, Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones"; EIA, CNEAF, "Nuclear Steam-Electric Units That Have Been in Operation as of 1957-1987"; EIA, CNEAF, "Monthly Report for Electric Utilities-Power Generation"; EIA, CNEAF, "Nuclear Plant Cancellations: Causes, Costs, and Consequences"; and Utility Data Institute, Inc., "U.S. Nuclear Plant Statistics, 1987." • 1983 forward—NRC, "Summary Information Report" (NUREG-0871); NRC, "Licensed Operating Reactors" (NUREG-0020); and EIA, Form EIA-860, "Annual Electric Generator Report."

# Figure 9.2 Nuclear Power Plant Operations

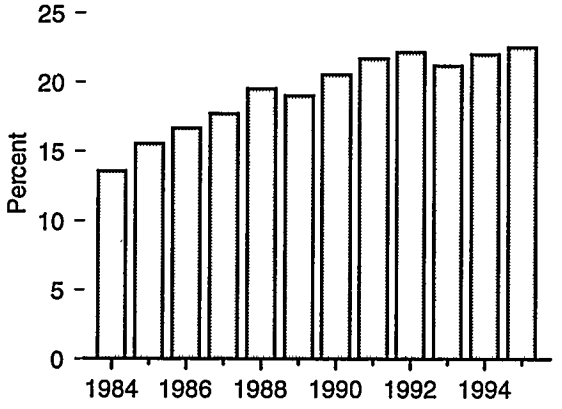
**Operable Units, 1957-1995**



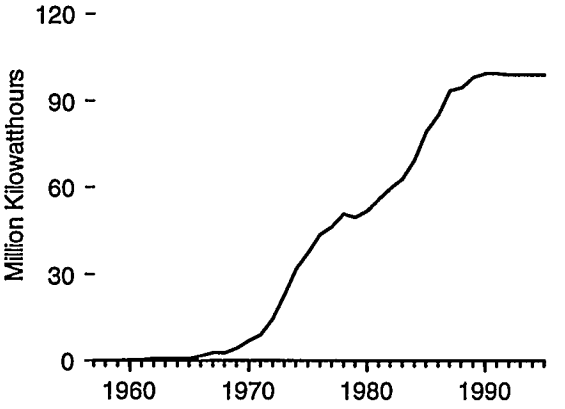

**Nuclear and Total Net Generation of Electricity, 1957-1995**



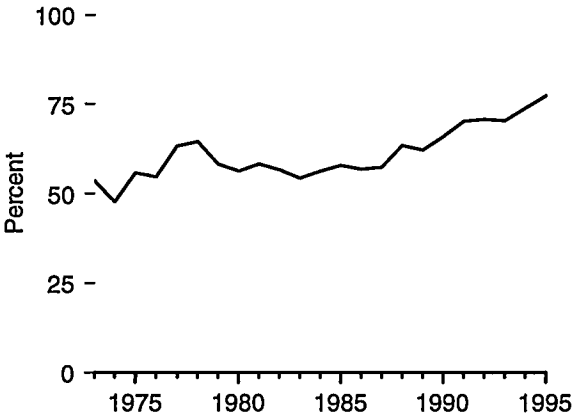

**Nuclear Portion of Domestic Electricity Net Generation, 1984-1995**




**Net Summer Capability of Operable Units, 1957-1995**




**Capacity Factor, 1973-1995**




Sources: Tables 8.3 and 9.2.

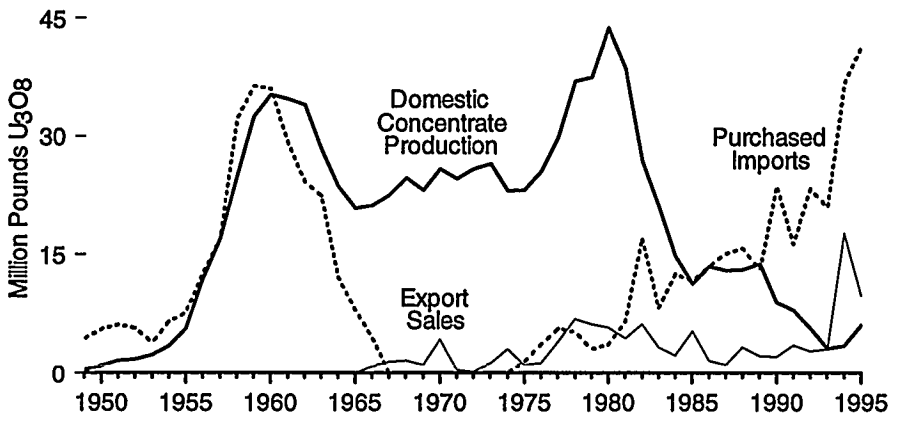
# Table 9.2 Nuclear Power Plant Operations, 1957-1995

| Year | Operable Units [1,2] | Nuclear Electricity Net Generation | Nuclear Portion of Domestic Electricity Net Generation | Net Summer Capability of Operable Units [1,3] | Capacity Factor [3] |
|---|---|---|---|---|---|
| | Number | Billion Kilowatthours | Percent | Million Kilowatts | Percent |
| 1957 | 1 | (s) | (s) | 0.1 | NA |
| 1958 | 1 | 0.2 | (s) | 0.1 | NA |
| 1959 | 1 | 0.2 | (s) | 0.1 | NA |
| 1960 | 3 | 0.5 | 0.1 | 0.4 | NA |
| 1961 | 3 | 1.7 | 0.2 | 0.4 | NA |
| 1962 | 5 | 2.3 | 0.3 | 0.7 | NA |
| 1963 | 6 | 3.2 | 0.4 | 0.8 | NA |
| 1964 | 6 | 3.3 | 0.3 | 0.8 | NA |
| 1965 | 6 | 3.7 | 0.3 | 0.8 | NA |
| 1966 | 8 | 5.5 | 0.5 | 1.7 | NA |
| 1967 | 10 | 7.7 | 0.6 | 2.7 | NA |
| 1968 | 11 | 12.5 | 0.9 | 2.7 | NA |
| 1969 | 14 | 13.9 | 1.0 | 4.4 | NA |
| 1970 | 18 | 21.8 | 1.4 | 7.0 | NA |
| 1971 | 21 | 38.1 | 2.4 | 9.0 | NA |
| 1972 | [2]29 | 54.1 | 3.1 | [2]14.5 | NA |
| 1973 | [2]39 | 83.5 | 4.5 | [2]22.7 | 53.5 |
| 1974 | 48 | 114.0 | 6.1 | 31.9 | 47.8 |
| 1975 | 54 | 172.5 | 9.0 | 37.3 | 55.9 |
| 1976 | 61 | 191.1 | 9.4 | 43.8 | 54.7 |
| 1977 | 65 | 250.9 | 11.8 | 46.3 | 63.3 |
| 1978 | 70 | 276.4 | 12.5 | 50.8 | 64.5 |
| 1979 | 68 | 255.2 | 11.4 | 49.7 | 58.4 |
| 1980 | 70 | 251.1 | 11.0 | 51.8 | 56.3 |
| 1981 | 74 | 272.7 | 11.9 | 56.0 | 58.2 |
| 1982 | 77 | 282.8 | 12.6 | 60.0 | 56.6 |
| 1983 | 80 | 293.7 | 12.7 | 63.0 | 54.4 |
| 1984 | 86 | 327.6 | 13.6 | 69.7 | 56.3 |
| 1985 | 95 | 383.7 | 15.5 | 79.4 | 58.0 |
| 1986 | 100 | 414.0 | 16.6 | 85.2 | 56.9 |
| 1987 | 107 | 455.3 | 17.7 | 93.6 | 57.4 |
| 1988 | 108 | 527.0 | 19.5 | 94.7 | 63.5 |
| 1989 | 110 | 529.4 | 19.0 | 98.2 | 62.2 |
| 1990 | 111 | 576.9 | 20.5 | 99.6 | 66.0 |
| 1991 | 111 | 612.6 | 21.7 | 99.6 | 70.2 |
| 1992 | 109 | 618.8 | 22.1 | 99.0 | 70.9 |
| 1993 | 109 | 610.3 | 21.2 | 99.0 | 70.5 |
| 1994 | 109 | [R]640.4 | 22.0 | [R]99.1 | [R]73.8 |
| 1995[P] | 109 | 673.4 | 22.5 | 99.1 | 77.5 |

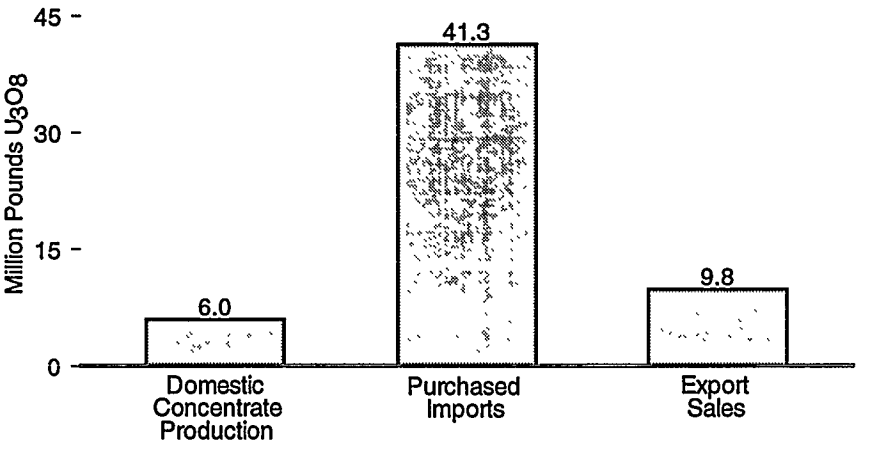
[1] At end of year.
[2] See Note 2 at end of section.
[3] See Note 3 at end of section.
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 0.05 billion kilowatthours or less than 0.05 percent.
Sources: **Operable Units:** • 1957-1972—Federal Power Commission (FPC), Form FPC-4, "Monthly Power Plant Report." • 1973 forward—Nuclear Regulatory Commission, *Licensed Operating Reactors*, (NUREG-0020), monthly. **Electricity Generation:** 1957-September 1977—FPC, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." **Net Summer Capability of Operable Units:** • 1957-1983—See Note 2 at end of section. • 1984 forward—EIA, Form EIA-860, "Annual Electric Generator Report."

# Figure 9.3 Uranium Overview

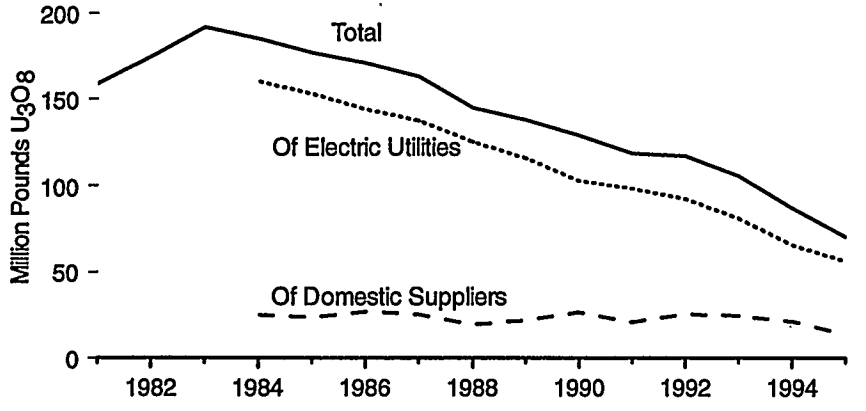
**Production and Trade, 1949-1995**



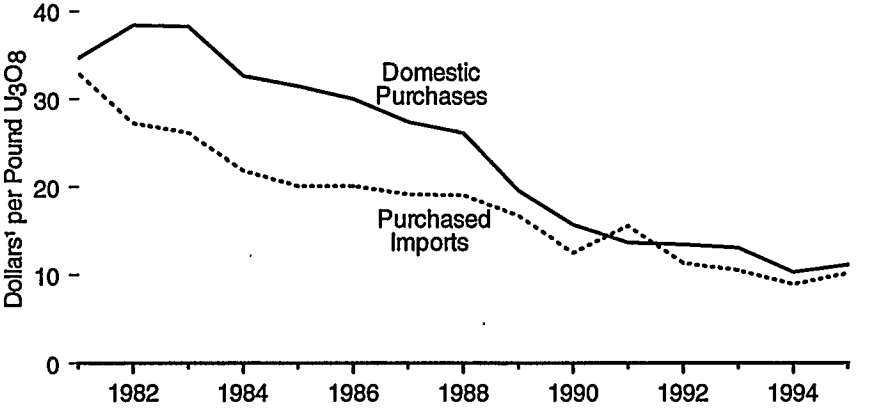

**Production and Trade, 1995**




**Inventories, End of Year 1981-1995**




**Average Prices, 1981-1995**




[1] Nominal dollars.
Note: Because vertical scales differ, graphs should not be compared.

Source: Table 9.3.

# Table 9.3 Uranium Overview, 1949-1995

| Year | Domestic Concentrate Production | Purchased Imports [1] | Export [1] Sales | Utility Purchases from Domestic Suppliers | Loaded into U.S. Nuclear Reactors [2] | Inventories | | | Average Price | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Of Domestic Suppliers | Of Electric Utilities | Total | Of Purchased Imports | Of Domestic Purchases |
| | Million Pounds $U_3O_8$ | | | | | | | | U.S. Dollars[3] per Pound $U_3O_8$ | |
| 1949 | 0.36 | 4.3 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1950 | 0.92 | 5.5 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1951 | 1.54 | 6.1 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1952 | 1.74 | 5.7 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1953 | 2.32 | 3.8 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1954 | 3.40 | 6.5 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1955 | 5.56 | 7.6 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1956 | 11.92 | 12.5 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1957 | 16.96 | 17.1 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1958 | 24.88 | 32.3 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1959 | 32.48 | 36.3 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1960 | 35.28 | 36.0 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1961 | 34.70 | 29.0 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1962 | 34.02 | 24.2 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1963 | 28.44 | 22.4 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1964 | 23.70 | 12.1 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1965 | 20.88 | 8.0 | 0.0 | NA | NA | NA | NA | NA | NA | NA |
| 1966 | 21.18 | 4.6 | 0.8 | NA | NA | NA | NA | NA | NA | NA |
| 1967 | 22.51 | 0.0 | 1.4 | NA | NA | NA | NA | NA | — | NA |
| 1968 | 24.74 | 0.0 | 1.6 | NA | NA | NA | NA | NA | — | NA |
| 1969 | 23.22 | 0.0 | 1.0 | NA | NA | NA | NA | NA | — | NA |
| 1970 | 25.81 | 0.0 | 4.2 | NA | NA | NA | NA | NA | — | NA |
| 1971 | 24.55 | 0.0 | 0.4 | NA | NA | NA | NA | NA | — | NA |
| 1972 | 25.80 | 0.0 | 0.2 | NA | NA | NA | NA | NA | — | NA |
| 1973 | 26.47 | 0.0 | 1.2 | NA | NA | NA | NA | NA | — | NA |
| 1974 | 23.06 | 0.0 | 3.0 | NA | NA | NA | NA | NA | — | NA |
| 1975 | 23.20 | 1.4 | 1.0 | NA | NA | NA | NA | NA | NA | NA |
| 1976 | 25.49 | 3.6 | 1.2 | NA | NA | NA | NA | NA | NA | NA |
| 1977 | 29.88 | 5.6 | 4.0 | NA | NA | NA | NA | NA | NA | NA |
| 1978 | 36.97 | 5.2 | 6.8 | NA | NA | NA | NA | NA | NA | NA |
| 1979 | 37.47 | 3.0 | 6.2 | NA | NA | NA | NA | NA | NA | NA |
| 1980 | 43.70 | 3.6 | 5.8 | NA | NA | NA | NA | NA | NA | NA |
| 1981 | 38.47 | 6.6 | 4.4 | 32.6 | NA | NA | NA | 159.2 | 32.90 | 34.65 |
| 1982 | 26.87 | 17.1 | 6.2 | 27.1 | NA | NA | NA | 174.8 | 27.23 | 38.37 |
| 1983 | 21.16 | 8.2 | 3.3 | 24.2 | NA | NA | NA | 191.8 | 26.16 | 38.21 |
| 1984 | 14.88 | 12.5 | 2.2 | 22.5 | NA | 25.0 | 160.2 | 185.2 | 21.86 | 32.65 |
| 1985 | 11.31 | 11.7 | 5.3 | 21.7 | NA | 23.7 | R153.2 | 176.9 | 20.08 | 31.43 |
| 1986 | 13.51 | 13.5 | 1.6 | 18.9 | NA | 27.0 | R144.1 | 171.1 | 20.07 | 30.01 |
| 1987 | 12.99 | 15.1 | 1.0 | 20.8 | NA | 25.4 | 137.8 | 163.2 | 19.14 | 27.37 |
| 1988 | 13.13 | 15.8 | 3.3 | 17.6 | NA | 19.3 | 125.5 | 144.8 | 19.03 | 26.15 |
| 1989 | 13.84 | 13.1 | 2.1 | 18.4 | NA | 22.2 | 115.8 | 138.1 | 16.75 | 19.56 |
| 1990 | 8.89 | 23.7 | 2.0 | 20.5 | NA | 26.4 | 102.7 | 129.1 | 12.55 | 15.70 |
| 1991 | 7.95 | 16.3 | 3.5 | 26.8 | 34.6 | 20.7 | 98.0 | 118.7 | 15.55 | 13.66 |
| 1992 | 5.65 | 23.3 | 2.8 | 23.4 | R43.0 | 25.2 | 92.1 | 117.3 | 11.34 | 13.45 |
| 1993 | 3.06 | 21.0 | 3.0 | 15.5 | 45.1 | R24.5 | R81.2 | R105.7 | 10.53 | 13.14 |
| 1994 | 3.35 | R36.6 | R17.7 | R22.7 | R40.4 | R21.5 | R65.4 | R86.9 | R8.95 | R10.30 |
| 1995[P] | 6.04 | 41.3 | 9.8 | 22.3 | 51.1 | 13.9 | 56.2 | 70.1 | 10.20 | 11.11 |

[1] Import quantities through 1970 are reported for fiscal years. Prior to 1968, the Atomic Energy Commission was the sole purchaser of all imported $U_3O_8$. Trade data prior to 1982 were for transactions conducted by uranium suppliers only. For 1982 forward, transactions by uranium buyers (consumers) have been included. Buyer imports and exports prior to 1982 are believed to be small.

[2] Does not include any fuel rods removed from reactors and later reloaded into the reactor.

[3] Nominal dollars.

R=Revised data. P=Preliminary data. NA=Not available. — = Not applicable.

Sources: See Note 4 at end of section.

## Nuclear Energy Notes

1. Nine units have been retired and therefore removed from the operable category. Those units are: Peach Bottom 1 (40 MW) and Indian Point 1 (265 MW), both retired in 1974; Humboldt Bay (65 MW), officially retired in 1976; Dresden 1 (200 MW), retired in October 1979; LaCrosse (51 MW), retired in May 1987; Fort Saint Vrain (217 MW), retired in October 1989; Yankee Rowe 1 (185 MW), retired in February 1992; San Onofre 1 (436 MW), retired in December 1992; and Trojan (1,104 MW), retired in January 1993.

In addition, several units have been excluded from the operable category that normally would have been included (and, in one case—Hanford-N—a unit was included that normally would have been excluded). Detailed information on those exceptions can be found in Energy Information Administration, *Monthly Energy Review* April 1996, DOE/EIA-0035(96/04) (Washington, DC, April 1996), p. 107.

2. Prior to 1973, the number of operable units included units that were in commercial operation by December 31 of the stated year. Units decommissioned or inoperative for extended periods were generally included. Also included were two DOE-operated plants that supply electricity to the commercial grid. A third DOE plant, which does not distribute electricity to the grid, was excluded. For 1973 forward, the number of units includes units issued full-power or operating licenses and generally does not include units in long-term shutdown status.

3. Net summer capabilities were first collected on Form EIA-860, "Annual Electric Generator Report," for 1984. Units not assigned a net summer capability rating by the utility were given an estimated rating by use of a statistical relationship between installed nameplate capacity and net summer capability for each prime mover. To estimate net summer capability for 1949-1984, two methods were used. For each prime mover except nuclear and "other," net summer capability estimates were calculated in two steps. First, the unit capacity values reported on Form EIA-860 and the unit start dates contained in the 1984 Generating Unit Reference File (GURF) were used to compute preliminary aggregate estimates of annual net summer capability and installed nameplate capacity. These preliminary estimates were obtained by aggregating unit capacity values for all units in service during a given year. Next, the ratio of the preliminary capability to nameplate estimate was computed for each year and multiplied by the previously published installed nameplate capacity values to produce the final estimates of net summer capability. The net summer capability data for nuclear and "other" units were used directly from the 1984 GURF for all years. Historical aggregates were then developed by use of the unit start dates on the GURF.

Historical capacity has also been modified to estimate capability based upon the operable definition. This was accomplished by assuming that nonnuclear generating units became operable between 1 and 4 months prior to their commercial operation dates, depending upon the prime mover and time period. The actual operable dates for nuclear units were used.

4. **Table 9.3 Sources:** • **1949–1966:** U.S. Department of Energy, Grand Junction Office, *Statistical Data of the Uranium Industry*, Report No. GJO-100, annual. • **1967–1995: Domestic Concentrate Production:** 1976–1984—Energy Information Administration, *Uranium Industry Annual 1992 (UIA 1992)* (October 1993), Table 17; 1985–1995—*UIA 1995* (May 1996), Table 5. **Purchased Imports and Export Sales:** 1967–1984—*UIA 1992* (October 1993), Table 30; 1985–1995—*UIA 1995* (May 1996), Table H2. **Utility Purchases From Domestic Suppliers:** 1981–1984—*UIA 1992* (October 1993), Table ES1; 1985–1995—*UIA 1995* (May 1996), Table 14. **Loaded Into U.S. Nuclear Reactors:** 1991—*UIA 1992* (October 1993), p. 61; 1992—*UIA 1993* (September 1994), p. 45; 1993—*UIA 1994* (July 1995), p. 37; 1994 and 1995—*UIA 1995* (May 1996), Table 27. **Inventories:** 1981–1983—*UIA 1992* (October 1993), Table ES1; 1984—*UIA 1985* (December 1986), Table 47; 1985—*UIA 1986* (October 1987), Tables 45 and 47; 1986—*UIA 1987* (October 1988), Tables 45 and 47; 1987—*UIA 1988* (September 1989), Table 47; 1988—*UIA 1989* (September 1990), Table 48; 1989—*UIA 1990* (September 1991), Table 44; 1990—*UIA 1991* (October 1992), Table 40; 1991—*UIA 1992* (November 1993), Table 40; 1992—*UIA 1993* (September 1994), Tables 39 and 40; 1993—*UIA 1994* (July 1995), Table 39; 1994 and 1995—*UIA 1995* (May 1996), Table 31. **Average Price:** 1981–1984—*UIA 1992* (October 1993), Table ES1; 1985–1995—*UIA 1995* (May 1996), Tables 14 and 28.

# 10. Renewable Energy

## Renewable Energy Consumption

In 1995, the United States consumed an estimated 6.9 quadrillion Btu of renewable energy (10.1a).* Conventional hydroelectric power and biofuels accounted for the largest shares (50 percent and 43 percent, respectively). Geothermal, solar, and wind energy accounted for the remainder.

Over the 6-year period of 1990 through 1995 (the only years for which data are available), renewable energy consumption rose 12 percent. Among the five major renewable energy sources, wind energy showed the greatest percentage increase (71 percent).

The types and amounts of renewable energy consumed varied by sector (10.1b). Electric utilities and the industrial sector (the primary source of nonutility electric power) were the biggest consumers throughout the 1990-through-1995 period.

***Conventional Hydroelectric Power.*** Almost all of the 3.5 quadrillion Btu of conventional hydroelectric power generation in 1995 occurred at electric utilities (10.1a and 10.1b). The industrial sector, which includes nonutility power producers (cogenerators, independent power producers, and small power producers), accounted for only 153 trillion Btu.

***Biofuels.*** Biofuels are fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels. In 1995, biofuel consumption totaled an estimated 2.9 quadrillion Btu, most of which (2.4 quadrillion Btu) was wood energy (10.2). Some industries, such as the paper and lumber industries, have ready access to wood and wood byproducts, and those rely heavily on wood as an energy source. Consumption of municipal solid waste and other wastes totaled 486 trillion Btu in 1995, and consumption of alcohol fuels (ethanol) totaled 105 trillion Btu.

***Geothermal Energy.*** The third biggest source of renewable energy in 1995 was geothermal energy, which can be used directly, for purposes such as space heating, or converted to electricity. In 1960, The Geysers in California became the first U.S. power plant to generate electricity from geothermal steam. In 1995, geothermal energy consumption reached 362 trillion Btu (10.1a), 118 trillion Btu at electric utilities and 244 trillion Btu by the industrial sector (which includes nonutilities) (10.1b).

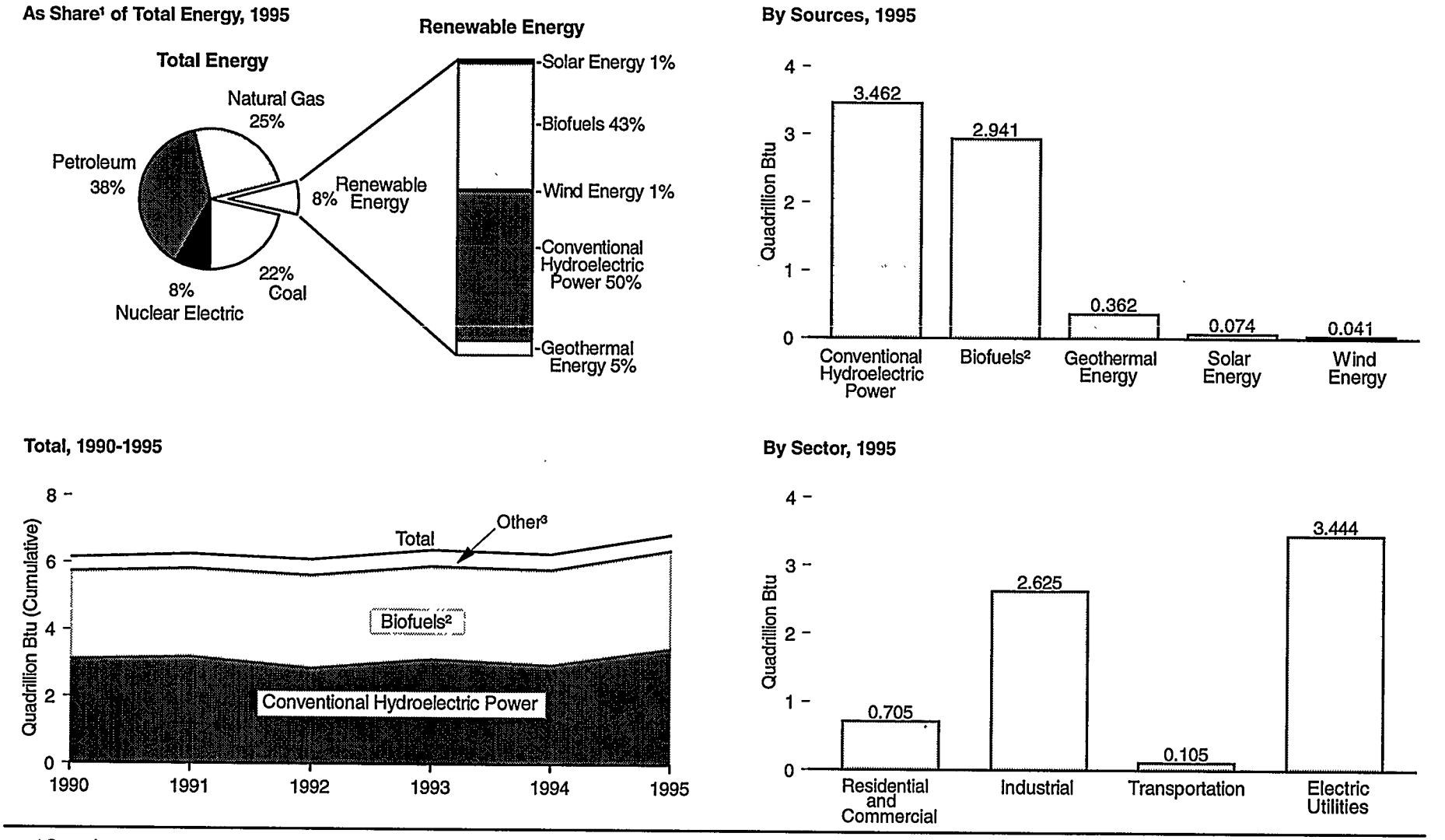
***Solar Energy.*** Of the 74 trillion Btu of solar energy supplied in 1995, most (64 trillion Btu) was used in the residential and commercial sector (10.1b). The industrial sector accounted for 10 trillion Btu and electric utilities accounted for less than 0.5 trillion Btu.

Because it is difficult to measure solar energy use directly, producer shipments of equipment are used as an indicator. Shipments of low-temperature collectors, used primarily for heating swimming pools, totaled 6.8 million square feet in 1994 (10.4). Shipments of medium-temperature collectors, used for pool heating and domestic hot water, peaked at 12 million square feet in 1983 and 1984 but, following the expiration of the Federal energy tax credit in 1985, totaled only 0.8 million square feet in 1994. Shipments of high-temperature collectors, used for electricity generation, reached 5.2 million square feet in 1990 but fell to near zero in 1991 through 1994, when Luz International Ltd. ceased operating. In 1994, shipments of photovoltaic cells and modules, which have a wide variety of applications, rose for the tenth consecutive year, to 26 thousand peak kilowatts (10.6).

***Wind Energy.*** An estimated 41 trillion Btu of wind energy was consumed in 1995, virtually all in the industrial sector (which includes nonutilities) (10.1b). Very small amounts (less than 0.5 trillion Btu) were consumed at electric utilities.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

# Figure 10.1 Renewable Energy Consumption Estimates




[1] Sum of components may not equal 100 percent due to independent rounding.

[2] Fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.

[3] Geothermal, solar, and wind energy.

Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 1.3, 10.1a, and 10.1b.

## Table 10.1a Renewable Energy Consumption by Source, 1990-1995

(Quadrillion Btu)

| Year | Biofuels [1] | Geothermal Energy[2] | Conventional Hydroelectric Power [3,4] | Solar Energy [5] | Wind Energy[6] | Total |
|---|---|---|---|---|---|---|
| 1990 | R2.632 | R0.338 | R3.102 | R0.067 | R0.024 | R6.163 |
| 1991 | R2.642 | R0.347 | R3.181 | R0.068 | R0.027 | R6.265 |
| 1992 | R2.788 | R0.367 | R2.852 | R0.068 | R0.030 | R6.106 |
| 1993 | R2.784 | R0.381 | R3.138 | R0.069 | R0.031 | R6.403 |
| 1994 | R2.852 | R0.381 | R2.958 | R0.068 | R0.036 | R6.296 |
| 1995E | 2.941 | 0.362 | 3.462 | 0.074 | 0.041 | 6.879 |

[1] Biofuels are fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.
[2] Includes electricity imports from Mexico that are derived from geothermal energy. Includes only grid-connected electricity. Excludes shaft power and remote electrical power.
[3] Hydroelectricity generated by pumped storage is not included in renewable energy.
[4] Includes electricity net imports from Canada that are derived from hydroelectric power.
[5] Includes photovoltaic energy.
[6] Includes only grid-connected electricity. Excludes direct heat applications.
R=Revised data. E=Estimate.
Source: Energy Information Administration, *Renewable Energy Annual 1995* (December 1995).

## Table 10.1b Renewable Energy Consumption by Sector, 1990-1995

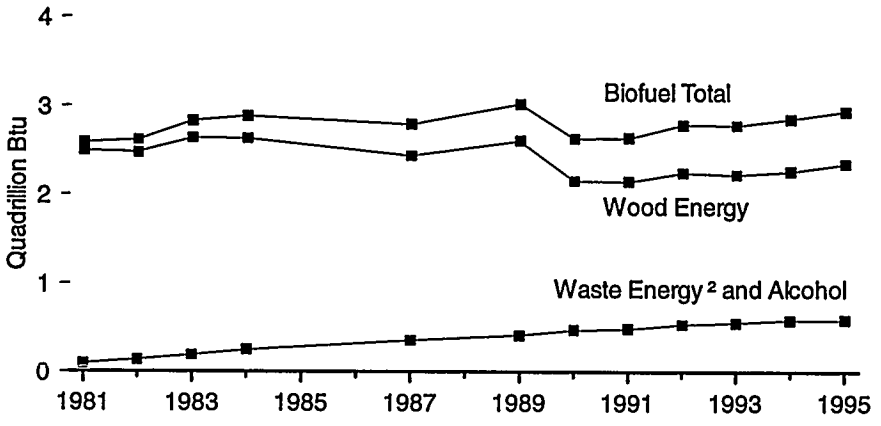
(Quadrillion Btu)

| | Residential and Commercial | | | Industrial [1] | | | | | | Transportation | Electric Utility[1] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Biofuels | Solar [2] | Total | Biofuels | Geothermal | Conventional Hydroelectric[3] | Solar | Wind | Total | Biofuels [4] | Biofuels | Geothermal[5] | Conventional Hydroelectric [3,6] | Solar and Wind | Total | Total |
| 1990 | 0.581 | 0.060 | 0.641 | R1.948 | R0.146 | R0.082 | R0.007 | R0.024 | R2.206 | 0.082 | 0.021 | 0.192 | R3.020 | (s) | R3.234 | R6.163 |
| 1991 | 0.613 | 0.060 | 0.673 | R1.943 | R0.162 | R0.083 | R0.008 | R0.027 | R2.223 | 0.065 | 0.021 | 0.185 | R3.098 | (s) | R3.304 | R6.265 |
| 1992 | 0.645 | 0.060 | 0.705 | R2.042 | R0.179 | R0.097 | R0.008 | R0.030 | R2.357 | 0.079 | 0.022 | 0.188 | R2.755 | (s) | R2.965 | R6.106 |
| 1993 | R0.592 | 0.060 | R0.652 | R2.084 | R0.204 | R0.118 | R0.009 | R0.031 | R2.446 | 0.088 | 0.020 | 0.177 | R3.019 | (s) | R3.217 | R6.403 |
| 1994 | R0.582 | 0.060 | R0.642 | R2.152 | R0.212 | R0.136 | R0.008 | R0.036 | R2.543 | R0.098 | 0.020 | 0.170 | R2.822 | (s) | R3.012 | R6.296 |
| 1995E | 0.641 | 0.064 | 0.705 | 2.178 | 0.244 | 0.153 | 0.010 | 0.041 | 2.625 | 0.105 | 0.017 | 0.118 | 3.309 | (s) | 3.444 | 6.879 |

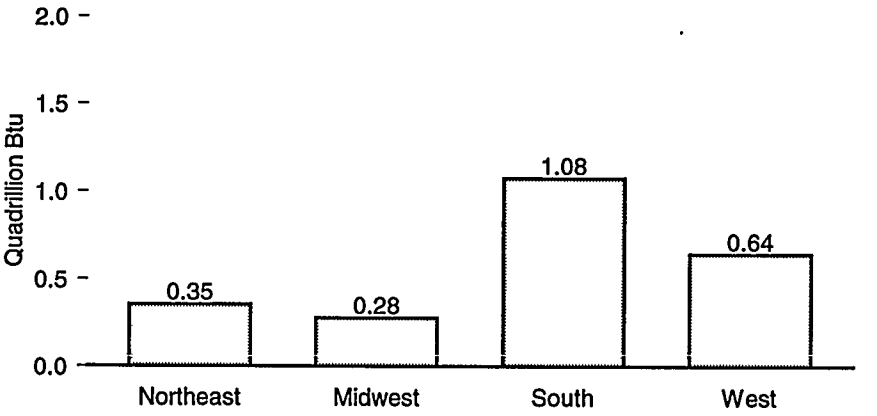
[1] Generation of electricity by cogenerators, independent power producers, and small power producers is included in the industrial sector, not the electric utility sector.
[2] The solar energy number of 0.06 quadrillion Btu for residential and commercial use is calculated by presuming an overall efficiency of 50 percent for all three categories of solar thermal collectors (low temperature, medium temperature, and high temperature), a 1,500-Btu per square foot average daily insolation, and the potential thermal energy production from the 219 million square feet of solar thermal collectors produced since 1974. This is a simplified approach since low-temperature and high-temperature collectors have been rated at more than 50 percent efficient and medium-temperature collectors are generally less than 50 percent efficient.
[3] Hydroelectricity generated by pumped storage is not included in renewable energy.
[4] Ethanol blended into motor gasoline.
[5] Includes electricity imports from Mexico that are derived from geothermal energy.
[6] Includes electricity net imports from Canada that are derived from hydroelectric power.
R=Revised data. E=Estimate. (s)=Less than 0.5 trillion Btu.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, *Renewable Energy Annual 1995* (December 1995).

# Figure 10.2 Wood and Waste Energy and Alcohol Fuels Consumption

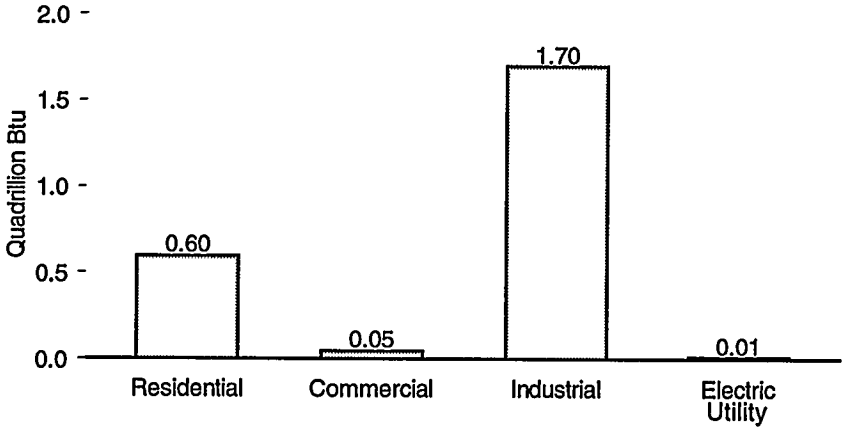
**Biofuel Total, 1981-1984, 1987, and 1989-1995[1]**



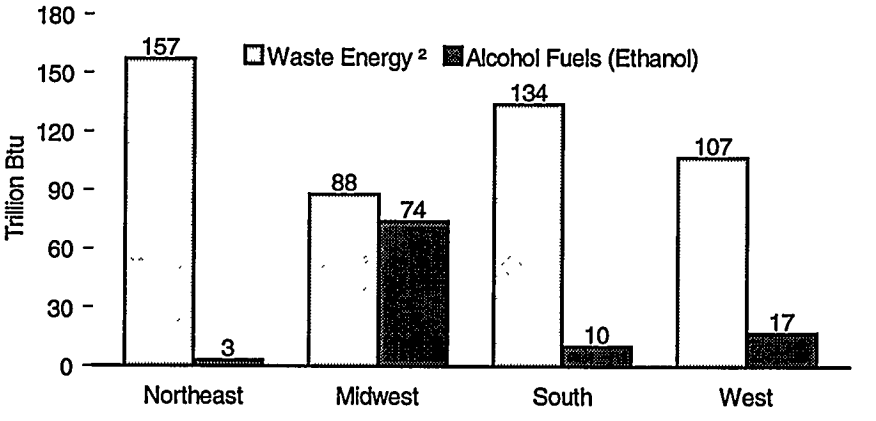

**Wood Energy by Census Region, 1995**




**Wood Energy by Sector, 1995**




**Waste Energy and Alcohol Fuels by Census Region, 1995**




[1] No data are available for 1985, 1986, and 1988.

[2] Municipal solid waste, manufacturing waste, refuse-derived fuel, and methane recovered from landfills.

Notes: • See Appendix F for Census regions. • Because vertical scales differ, graphs should not be compared.

Source: Table 10.2.

# Table 10.2 Wood and Waste Energy and Alcohol Fuels Consumption by Sector and Census Region, Selected Years, 1981-1995

(Trillion Btu)

| Energy Source | 1981 | 1982 | 1983 | 1984 | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wood Energy** | 2,495 | 2,478 | 2,640 | 2,633 | 2,437 | 2,604 | 2,155 | R2,151 | 2,249 | R2,228 | R2,266 | 2,350 |
| Sector | | | | | | | | | | | | |
| Residential | 869 | 937 | 925 | 923 | 852 | 918 | 581 | 613 | 645 | 548 | 537 | 596 |
| Commercial | 21 | 22 | 22 | 22 | (1) | (1) | (1) | (1) | (1) | R44 | R45 | 45 |
| Industrial | 1,602 | 1,516 | 1,690 | 1,679 | 1,576 | 1,673 | 1,562 | 1,528 | 1,593 | 1,625 | 1,673 | 1,698 |
| Electric Utility | 3 | 2 | 3 | 9 | 9 | 13 | 12 | 10 | 11 | 11 | 11 | 11 |
| Census Region | | | | | | | | | | | | |
| Northeast | 395 | 358 | 380 | 349 | 350 | 432 | 256 | 224 | 264 | R277 | R278 | 354 |
| Midwest | 335 | 343 | 323 | 341 | 474 | 552 | 330 | 290 | 286 | R222 | R223 | 277 |
| South | 1,349 | 1,392 | 1,526 | 1,482 | 1,147 | 1,161 | 1,064 | 1,167 | 1,234 | R1,405 | R1,437 | 1,075 |
| West | 416 | 385 | 411 | 461 | 467 | 459 | 505 | R469 | 466 | R324 | R328 | 644 |
| **Waste Energy** [2] | 88 | 120 | 157 | 208 | 289 | 344 | 395 | 426 | R460 | 468 | R488 | 486 |
| Census Region | | | | | | | | | | | | |
| Northeast | 16 | 20 | 36 | 39 | 60 | 84 | 119 | R133 | 148 | 151 | 157 | 157 |
| Midwest | 5 | 13 | 17 | 21 | 47 | 64 | 89 | R98 | 84 | 85 | R89 | 88 |
| South | 37 | 50 | 56 | 57 | 108 | 145 | 114 | R108 | 128 | 130 | R135 | 134 |
| West | 30 | 36 | 48 | 91 | 74 | 51 | 73 | 87 | 100 | 102 | 107 | 107 |
| **Alcohol Fuels (Ethanol)** | 7 | 19 | 35 | 43 | 69 | 71 | 82 | 65 | 79 | 88 | R98 | 105 |
| Census Region | | | | | | | | | | | | |
| Northeast | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | (s) | 3 |
| Midwest | 4 | 11 | 22 | 25 | 38 | 38 | R55 | R45 | 55 | 61 | R68 | 74 |
| South | 1 | 4 | 8 | 13 | 26 | 26 | R17 | R11 | 13 | 15 | 16 | 10 |
| West | 2 | 4 | 5 | 5 | 4 | 7 | R10 | R9 | 10 | 11 | 12 | 17 |
| **Biofuel Total** | 2,590 | 2,617 | 2,832 | 2,884 | 2,794 | 3,019 | 2,632 | R2,642 | R2,788 | R2,784 | R2,852 | 2,941 |

[1] Commercial wood energy use is not included because there are no accurate data sources to provide reliable estimates.

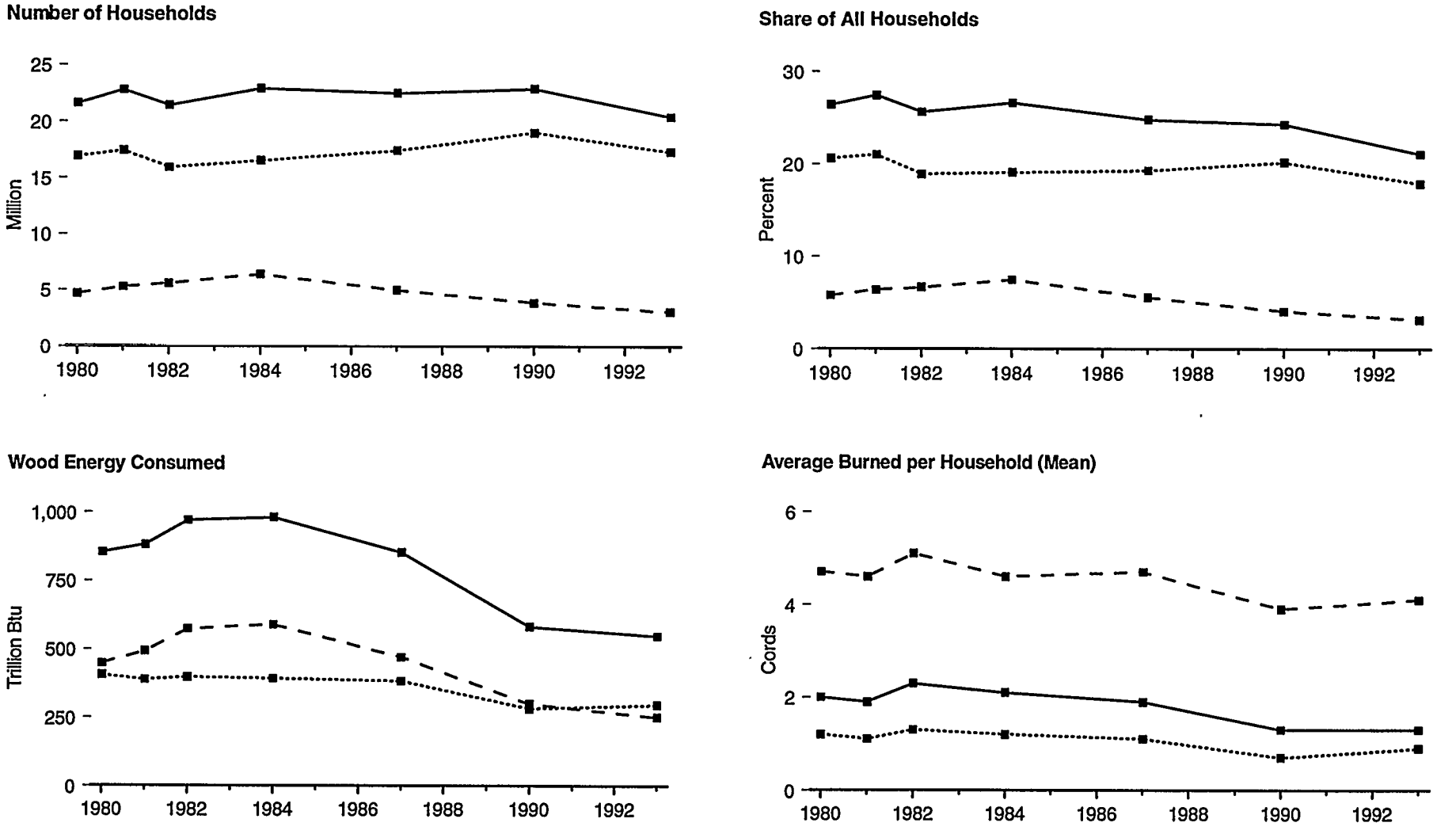
[2] Municipal solid waste, manufacturing waste, refuse-derived fuel, and methane recovered from landfills.

R=Revised data. (s)=Less than 0.5 trillion Btu.

Notes: • No data are available for years not shown. • See Appendix F for Census regions. • Totals may not equal sum of components due to independent rounding.

Sources: • **1981-1983, Wood Energy**—EIA, *Estimates of U.S. Wood Energy Consumption, 1980-1983* (November 1984), Tables ES1 and ES2. • **1981-1983 Waste Energy and Alcohol Fuels, and 1984 Data**—EIA, Office of Coal, Nuclear, Electric and Alternate Fuels, unpublished data. • **1987**—EIA, *Estimates of Biofuels Consumption in the United States During 1987*, Tables ES1 and ES2. • **1989—Wood Energy, Industrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 31, 1991). **All Other Data:** EIA, *Estimates of U.S. Biofuels Consumption 1989* (April 1991), Table ES1. • **1990—Wood Energy, Industrial Sector:** American Paper Institute, *Fact Sheet on 1990 Energy Use in the U.S. Pulp and Paper Industry* (July 1991). **Wood Energy, Residential Sector:** EIA, 1990 Residential Energy Consumption Survey. **Waste Energy:** EIA, *Estimates of U.S. Biofuels Consumption 1990* (October 1991), Table ES1. **Alcohol Fuels:** U.S. Department of Transportation, *Monthly Motor Fuel Reported by States*, FHWA-PL-92-011 (September 1991), and U.S. Department of Treasury, Bureau of Alcohol, Tobacco, and Firearms, *Monthly Distilled Spirits Report*, Report Symbol 76 (June 1991) and *Alcohol Fuels Report*, internal quarterly report (September 1991). • **1991 and 1992:** EIA, *Estimates of U.S. Biomass Energy Consumption 1992* (May 1994). **1993-1995—Wood Energy, Residential Sector:** EIA, Form EIA-457, "1993 Residential Energy Consumption Survey," and extrapolations from "1993 Residential Energy Consumption Survey" for 1994 and 1995 estimates. **Wood Energy, Commercial and Industrial Sectors:** EIA, Office of Coal, Nuclear, Electric and Alternate Fuels (CNEAF), estimates derived from information from other government agencies, trade journals, industry association reports, and Form EIA-846, "1991 Manufacturing Energy Consumption Survey." **Wood Energy, Electric Utility:** EIA, Form EIA-867, "Annual Nonutility Power Producer Report," and Form EIA-861, "Annual Electric Utility Report. **Waste Energy:** Government Advisory Associates, *Resource Recovery Yearbook*, and *Methane Recovery Yearbook*, and CNEAF estimates. **Alcohol:** EIA, Form EIA-819M, "Monthly Oxygenate Telephone Report.

## Figure 10.3 Households That Burn Wood, Selected Years, 1980-1993




Note: No data are available for 1983, 1985, 1986, 1988, 1989, 1991, and 1992.

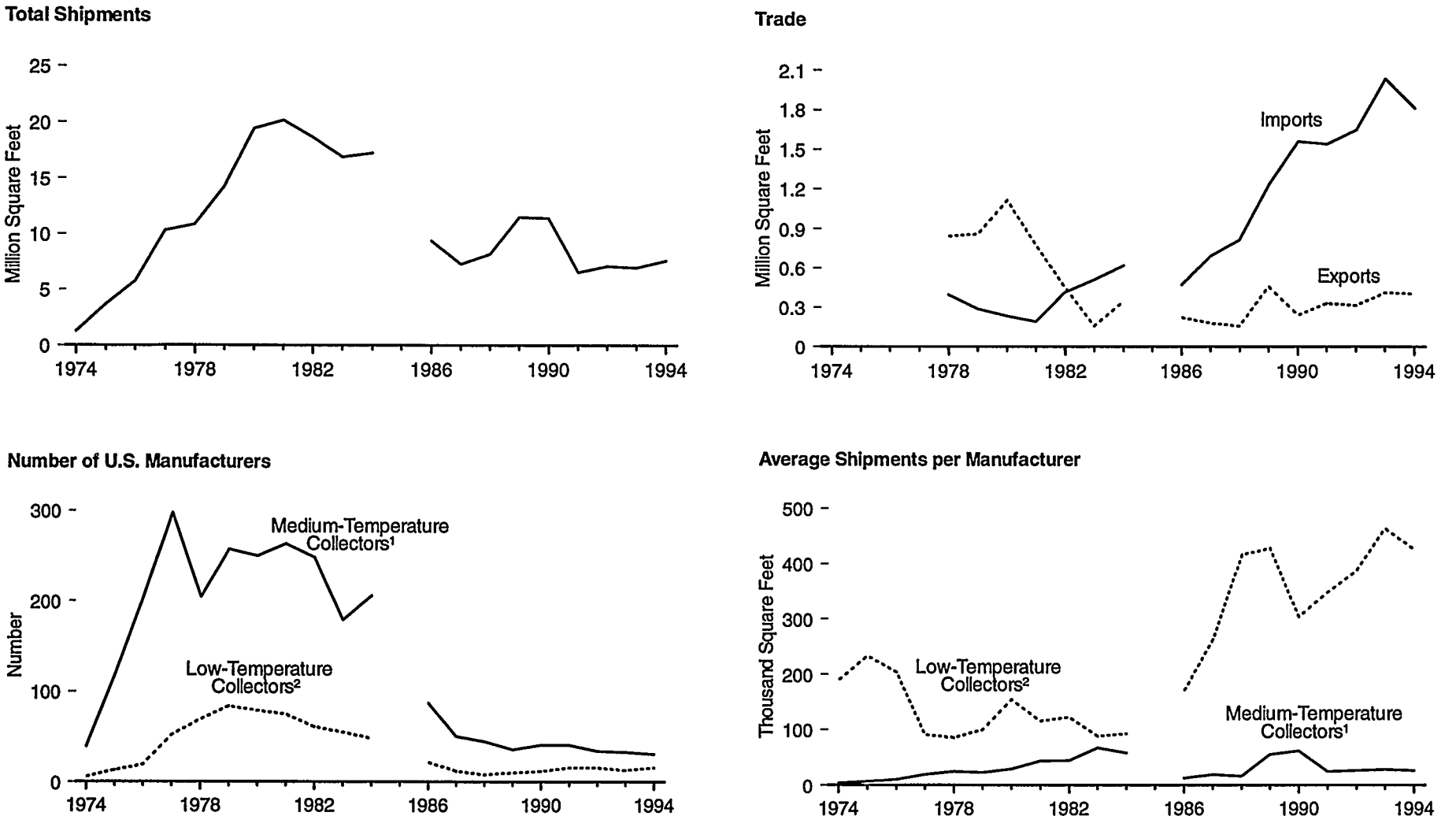
Source: Table 10.3

# Table 10.3 Households That Burn Wood, Selected Years, 1980-1993

| Household Characteristic | 1980 | 1981 | 1982 | 1984 | 1987 | 1990 | 1993 |
|---|---|---|---|---|---|---|---|
| **Households That Burn Wood** | | | | | | | |
| Number of Households (millions) | 21.6 | 22.8 | 21.4 | 22.9 | 22.5 | 22.9 | 20.4 |
| Share of All U.S. Households (percent) | 26.4 | 27.4 | 25.6 | 26.6 | 24.8 | 24.3 | 21.1 |
| Number of Cords Burned (millions) | 42.7 | 44.0 | 48.6 | 49.0 | 42.6 | 29.1 | 27.4 |
| Average Number of Cords Burned per Household | | | | | | | |
| Mean | 2.0 | 1.9 | 2.3 | 2.1 | 1.9 | 1.3 | 1.3 |
| Median | 0.7 | 1.0 | 1.0 | 1.0 | 0.7 | 0.5 | 0.5 |
| Wood Energy Consumed (trillion Btu) | 854 | 881 | 971 | 981 | 853 | 582 | 548 |
| **Households That Burn Wood as Main Heating Fuel** | | | | | | | |
| Number of Households (millions) | 4.7 | 5.3 | 5.6 | 6.4 | 5.0 | 3.9 | 3.1 |
| Share of All U.S. Households (percent) | 5.8 | 6.4 | 6.7 | 7.5 | 5.6 | 4.1 | 3.2 |
| Number of Cords Burned (millions) | 22.4 | 24.7 | 28.7 | 29.4 | 23.5 | 15.0 | 12.6 |
| Average Number of Cords Burned per Household | | | | | | | |
| Mean | 4.7 | 4.6 | 5.1 | 4.6 | 4.7 | 3.9 | 4.1 |
| Median | 3.3 | 3.0 | 4.0 | 4.0 | 4.0 | 3.3 | 3.0 |
| Wood Energy Consumed (trillion Btu) | 448 | 493 | 574 | 589 | 470 | 300 | 252 |
| **Households That Burn Wood as Secondary Heating Fuel and for Other Purposes** | | | | | | | |
| Number of Households (millions) | 16.9 | 17.4 | 15.9 | 16.5 | 17.4 | 19.0 | 17.3 |
| Share of All U.S. Households (percent) | 20.6 | 21.0 | 18.9 | 19.1 | 19.3 | 20.2 | 17.9 |
| Number of Cords Burned (millions) | 20.3 | 19.4 | 19.9 | 19.6 | 19.2 | 14.1 | 14.8 |
| Average Number of Cords Burned per Household | | | | | | | |
| Mean | 1.2 | 1.1 | 1.3 | 1.2 | 1.1 | 0.7 | 0.9 |
| Median | 0.3 | 0.5 | 0.5 | 0.5 | 0.5 | 0.3 | 0.3 |
| Wood Energy Consumed (trillion Btu) | 406 | 388 | 397 | 392 | 383 | 282 | 296 |

Notes: • Data are for the heating season beginning with the latter part of the previous year shown.
• Consumption estimates are based on respondent reports and may be subject to reporting biases.
• No data are available for years not shown.
Source: Energy Information Administration, Form EIA-457, "Residential Energy Consumption Survey."

## Figure 10.4 Solar Thermal Collector Shipments and Trade, 1974-1984 and 1986-1994




[1] Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit.

[2] Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

Notes: • Data were not collected for 1985. • Medium-temperature collectors include special collectors. • Because vertical scales differ, graphs should not be compared.

Source: Table 10.4.

# Table 10.4 Solar Thermal Collector Shipments by Type and Trade, 1974-1984 and 1986-1994

| Year | Low-Temperature Collectors [1] | | | Medium-Temperature Collectors [2] | | | High-Temperature Collector [3] Shipments (million square feet) | Total Shipments [4] | Imports | Exports |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of U.S. Manufacturers | Quantity Shipped (million square feet) | Average Annual Shipments per Manufacturer (thousand square feet) | Number of U.S. Manufacturers | Quantity Shipped (million square feet) | Average Annual Shipments per Manufacturer (thousand square feet) | | Thousand Square Feet | | |
| 1974 | 6 | 1.14 | 189.5 | 39 | 0.14 | 3.5 | NA | 1,274 | NA | NA |
| 1975 | 13 | 3.03 | 232.8 | 118 | 0.72 | 6.1 | NA | 3,743 | NA | NA |
| 1976 | 19 | 3.88 | 204.0 | 203 | 1.93 | 9.5 | NA | 5,801 | NA | NA |
| 1977 | 52 | 4.74 | 91.2 | 297 | 5.57 | 18.8 | NA | 10,312 | NA | NA |
| 1978 | 69 | 5.87 | 85.1 | 204 | 4.99 | 24.5 | NA | 10,860 | 396 | 840 |
| 1979 | 84 | 8.39 | 100.0 | 257 | 5.86 | 22.8 | NA | 14,251 | 290 | 855 |
| 1980 | 79 | 12.23 | 154.8 | 250 | 7.17 | 28.7 | NA | 19,398 | 235 | 1,115 |
| 1981 | 75 | 8.68 | 115.7 | 263 | 11.46 | 43.6 | NA | 20,133 | 196 | 771 |
| 1982 | 61 | 7.48 | 122.6 | 248 | 11.15 | 44.9 | NA | 18,621 | 418 | 455 |
| 1983 | 55 | 4.85 | 88.2 | 179 | 11.98 | 66.9 | NA | 16,828 | 511 | 159 |
| 1984 | 48 | 4.48 | 93.3 | 206 | 11.94 | 58.0 | 0.77 | 17,191 | 621 | 348 |
| 1986 | 22 | 3.75 | 170.5 | 87 | 1.11 | 12.8 | 4.50 | 9,360 | 473 | 224 |
| 1987 | 12 | 3.16 | 263.1 | 50 | 0.96 | 19.1 | 3.16 | 7,269 | 691 | 182 |
| 1988 | 8 | 3.33 | 415.8 | 45 | 0.73 | 16.2 | 4.12 | 8,174 | 814 | 158 |
| 1989 | 10 | 4.28 | 428.3 | 36 | 1.99 | 55.3 | 5.21 | 11,482 | 1,233 | 461 |
| 1990 | 12 | 3.65 | 303.8 | 41 | 2.53 | 61.6 | 5.24 | 11,409 | 1,562 | 245 |
| 1991 | 16 | 5.59 | 349.0 | 41 | 0.99 | 24.1 | (s) | 6,574 | 1,543 | 332 |
| 1992 | 16 | 6.19 | 386.7 | 34 | 0.90 | 26.4 | (s) | 7,086 | 1,650 | 316 |
| 1993 | 13 | 6.03 | 463.5 | 33 | 0.93 | 28.2 | (s) | 6,968 | 2,039 | 411 |
| 1994 | 16 | 6.82 | 426.0 | 31 | 0.80 | 26.0 | (s) | 7,627 | 1,815 | 405 |

[1] Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

[2] Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit. Special collectors are included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

[3] High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit.

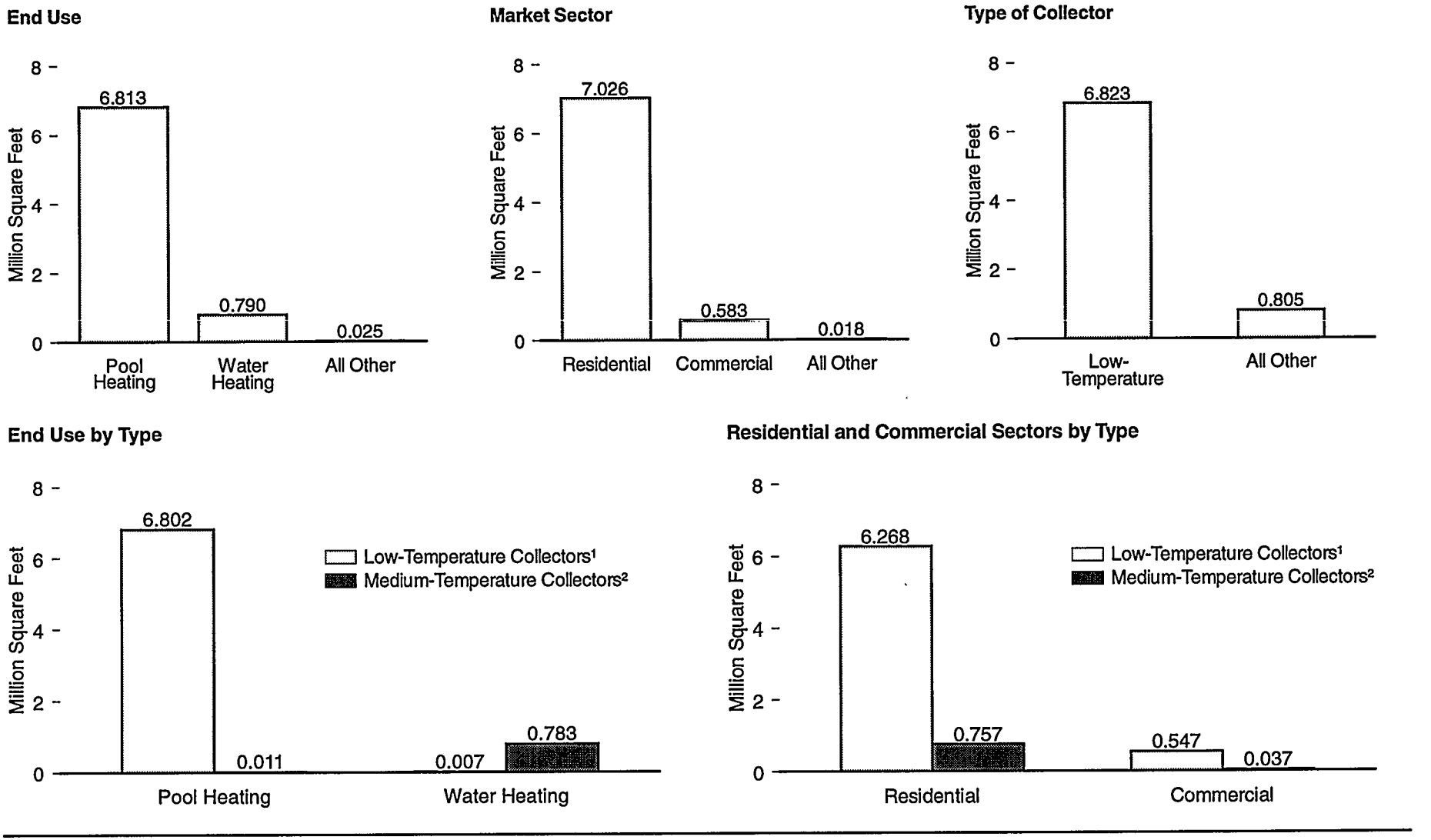
[4] Total shipments as reported by respondents include all domestic and export shipments and may include imports that subsequently were shipped to domestic or to foreign customers.

NA=Not available. (s)=Less than 0.005 million square feet.

Notes: • Manufacturers producing more than one type of collector are accounted for in both groups. • No data are available for 1985. • High-temperature collector shipments were dominated by one manufacturer.

Sources: **Number of U.S. Manufacturers:** Energy Information Administration (EIA), Form CE-63A, "Annual Solar Thermal Collector Manufacturers Survey," and prior form, Form EIA-63, "Annual Solar Thermal Collector and Photovoltaic Module Manufacturing Survey." **Shipments Data by Type:** • 1974-1976—Federal Energy Administration, *Solar Collector Manufacturing Activity*, semi-annual. • 1977—EIA, *Solar Collector Manufacturing Activity, July through December, 1981* (March 1982). • 1978 and 1979—EIA, *Solar Collector Manufacturing Activity*, annual. • 1980-1985—EIA, *Solar Collector Manufacturing Activity 1993* (August 1994), Table 6. • 1986 forward—EIA, *Renewable Energy Annual 1995* (December 1995), Tables 12 and 13.

## Figure 10.5 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1994




¹ Collectors that generally operate at temperatures below 110 degrees Fahrenheit.

² Collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit.

Source: Table 10.5.

# Table 10.5 Solar Thermal Collector Shipments by End Use, Market Sector, and Type, 1994

(Thousand Square Feet)

| End Use | Low-Temperature Collectors [1] | Medium-Temperature Collectors [2] | High-Temperature Collectors [3] | Total |
|---|---|---|---|---|
| **End-Use Total** | 6,823 | 803 | 2 | 7,627 |
| Pool Heating | 6,802 | 11 | 0 | 6,813 |
| Water Heating | 7 | 783 | 0 | 790 |
| Space Heating | 14 | 5 | 0 | 19 |
| Space Cooling | 0 | 0 | 0 | 0 |
| Combined Space and Water Heating | 0 | 4 | 0 | 4 |
| Process Heating | 0 | 0 | 0 | 0 |
| Electricity Generation | 0 | 0 | 2 | 2 |
| Other [4] | 0 | 0 | 0 | 0 |
| **Market Sector Total** | 6,823 | 803 | 2 | 7,627 |
| Residential | 6,268 | 757 | 0 | 7,026 |
| Commercial | 547 | 37 | 0 | 583 |
| Industrial | 7 | 8 | 1 | 16 |
| Electric Utility | 0 | 1 | 1 | 2 |
| Other [5] | 0 | 0 | 0 | 0 |

[1] Low-temperature collectors are solar thermal collectors that generally operate at temperatures below 110 degrees Fahrenheit.

[2] Medium-temperature collectors are solar thermal collectors that generally operate in the temperature range of 140 degrees Fahrenheit to 180 degrees Fahrenheit but can also operate at temperatures as low as 110 degrees Fahrenheit. Special collectors are included in this category. Special collectors are evacuated tube collectors or concentrating (focusing) collectors. They operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

[3] Parabolic dish/trough collectors used primarily by independent power producers to generate electricity for the electric grid. High-temperature collectors are solar thermal collectors that generally operate at temperatures above 180 degrees Fahrenheit.

[4] "Other" includes shipments of solar thermal collectors for other uses, such as cooking foods, water pumping, water purification, desalinization, distilling, etc.

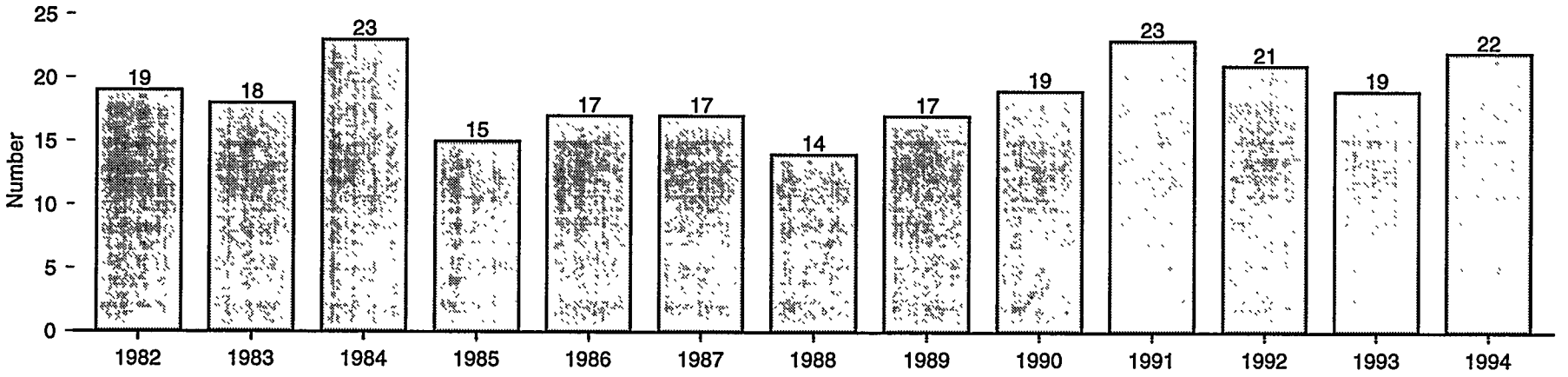
[5] "Other" includes shipments of solar thermal collectors to other sectors, such as government, including the military but excluding space applications.

Notes: • Data represent shipments from U.S. manufacturers only. • Totals may not equal sum of components due to independent rounding.

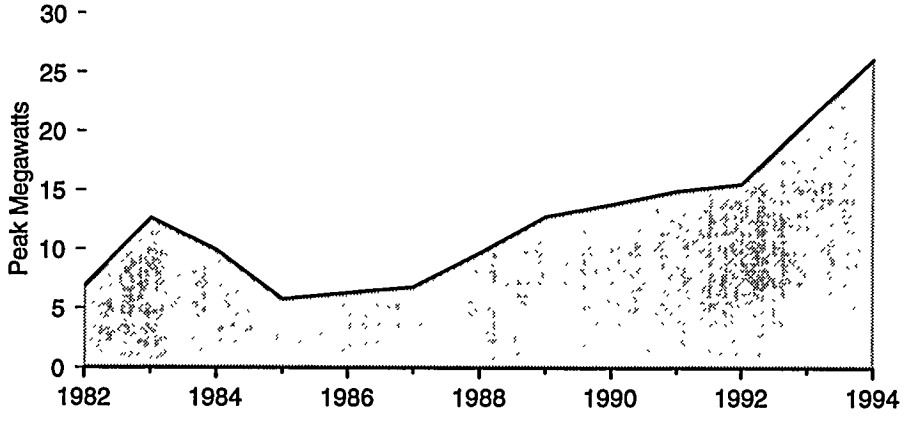
Source: Energy Information Administration, *Renewable Energy Annual 1995* (December 1995), Table 35.

# Figure 10.6 Photovoltaic Cell and Module Shipments and Trade

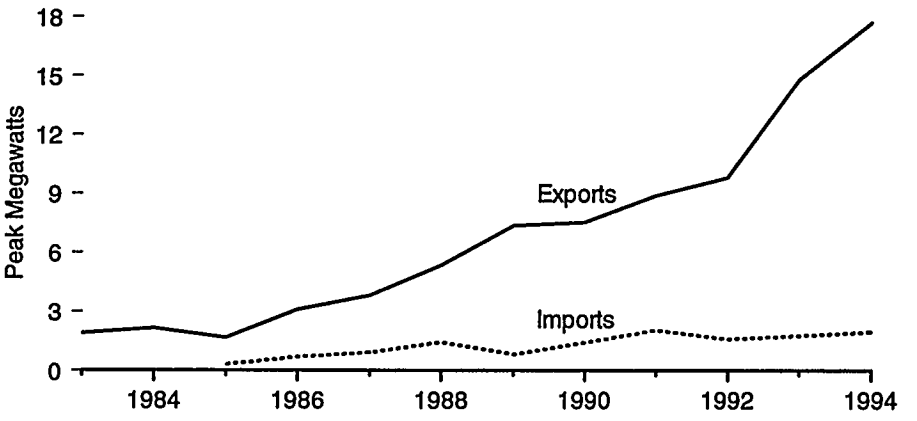
**Number of U.S. Companies Reporting Shipments, 1982-1994**




**Total Shipments, 1982-1994**




**Trade, 1983-1994**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 10.6

# Table 10.6 Photovoltaic Cell and Module Shipments and Trade, 1982-1994

| Year | Number of U.S. Companies Reporting Shipments | Total Shipments [1] | Imports | Exports |
|---|---|---|---|---|
| | | Peak Kilowatts | | |
| 1982 | 19 | 6,897 | NA | NA |
| 1983 | 18 | 12,620 | NA | 1,903 |
| 1984 | 23 | 9,912 | NA | 2,153 |
| 1985[2] | 15 | 5,769 | 285 | 1,670 |
| 1986[2] | 17 | 6,333 | 678 | 3,109 |
| 1987[2] | 17 | 6,850 | 921 | 3,821 |
| 1988[2] | 14 | 9,676 | 1,453 | 5,358 |
| 1989[2] | 17 | 12,825 | 826 | 7,363 |
| 1990[2] | [3]19 | [3]13,837 | 1,398 | 7,544 |
| 1991[2] | 23 | 14,939 | 2,059 | 8,905 |
| 1992[2] | 21 | 15,583 | 1,602 | 9,823 |
| 1993[2] | 19 | 20,951 | 1,767 | 14,814 |
| 1994[2] | 22 | 26,077 | 1,960 | 17,714 |

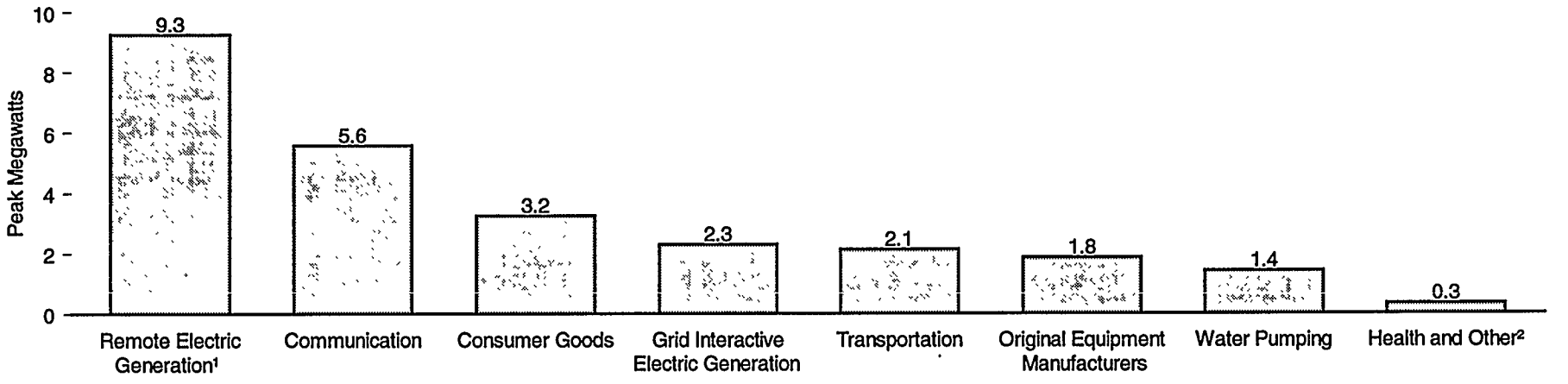
[1] Total shipments include all types of photovoltaic cells and modules (single-crystal silicon, cast silicon, ribbon silicon, thin-film silicon, and concentrator silicon) and internationally traded cells and modules.
[2] Shipments of cells and modules for space and satellite applications are not included.
[3] Data were imputed for one nonrespondent who exited the industry during 1990.

NA=Not available.

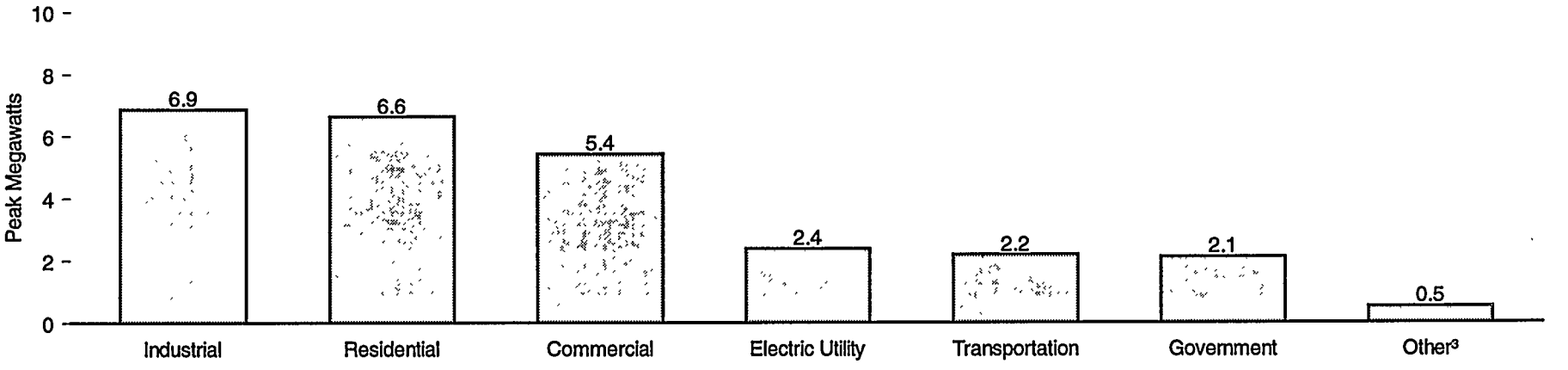
Sources: • 1982-1984—Energy Information Administration (EIA), *Solar Collector Manufacturing Activity 1993* (August 1994), Table 16. • 1985 forward—EIA, *Renewable Energy Annual 1995* (December 1995), Table 15.

## Figure 10.7 Photovoltaic Cell and Module Shipments by End Use, 1994

**By End Use**




**By Market Sector**




[1] Units designed for installations that are not grid-interactive.
[2] Represents such applications as cooking food, desalinization, and distilling.
[3] Shipments to foreign governments and for specialty purposes.
Source: Table 10.7.

# Table 10.7 Photovoltaic Cell and Module Shipments by End Use, 1989-1994

| End Use | Amount Shipped (peak kilowatts) | | | | | | Percent of Total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
| **End-Use Total** | 12,825 | 13,837 | 14,939 | 15,583 | 20,951 | 26,077 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Health | 5 | 5 | 61 | 67 | 674 | 79 | (s) | (s) | 0.4 | 0.4 | 3.2 | 0.3 |
| Water Pumping | 711 | 1,014 | 729 | 809 | 2,294 | 1,410 | 5.5 | 7.3 | 4.9 | 5.2 | 10.9 | 5.4 |
| Transportation | 1,196 | 1,069 | 1,523 | 1,602 | 4,238 | 2,128 | 9.3 | 7.7 | 10.2 | 10.3 | 20.2 | 8.2 |
| Communications | 2,590 | 4,340 | 3,538 | 3,717 | 3,846 | 5,570 | 20.2 | 31.4 | 23.7 | 23.9 | 18.4 | 21.4 |
| Consumer Goods | 2,788 | 2,484 | 3,312 | 2,566 | 946 | 3,239 | 21.7 | 18.0 | 22.2 | 16.5 | 4.5 | 12.4 |
| Electric Generation | | | | | | | | | | | | |
| Grid Interactive | 1,251 | 469 | 856 | 1,227 | 1,096 | 2,296 | 9.8 | 3.4 | 5.7 | 7.9 | 5.2 | 8.8 |
| Remote [1] | 2,620 | 3,097 | 3,594 | 4,238 | 5,761 | 9,253 | 20.4 | 22.4 | 24.1 | 27.2 | 27.5 | 35.5 |
| Original Equipment Manufacturers [2] | [3] 1,595 | [4] 1,119 | [4] 1,315 | 828 | 2,023 | 1,849 | 12.4 | 8.1 | 8.8 | 5.3 | 9.7 | 7.1 |
| Other [5] | [6] 69 | 240 | 13 | 530 | 74 | 254 | 0.5 | 1.7 | 0.1 | 3.4 | 0.4 | 1.0 |
| **Market Sector Total** | 12,825 | 13,837 | 14,939 | 15,583 | 20,951 | 26,077 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Residential | 1,439 | 1,701 | 3,624 | 4,154 | 5,237 | 6,632 | 11.2 | 12.3 | 24.3 | 26.7 | 25.0 | 25.4 |
| Commercial | 3,850 | 6,086 | 3,345 | 2,386 | 4,115 | 5,429 | 30.0 | 44.0 | 22.4 | 15.3 | 19.6 | 20.8 |
| Government | 1,077 | 1,002 | 815 | 1,063 | 1,325 | 2,114 | 8.4 | 7.2 | 5.5 | 6.8 | 6.3 | 8.1 |
| Industrial | 3,993 | 2,817 | 3,947 | 4,279 | 5,352 | 6,855 | 31.1 | 20.4 | 26.4 | 27.5 | 25.5 | 26.3 |
| Transportation | 1,130 | 974 | 1,555 | 1,673 | 2,564 | 2,174 | 8.8 | 7.0 | 10.4 | 10.7 | 12.2 | 8.3 |
| Electric Utility | 785 | 826 | 1,275 | 1,553 | 1,503 | 2,364 | 6.1 | 6.0 | 8.5 | 10.0 | 7.2 | 9.1 |
| Other [7] | 551 | 432 | 377 | 477 | 856 | 510 | 4.3 | 3.1 | 2.5 | 3.0 | 4.1 | 2.0 |

[1] Electric power generation photovoltaic units designed for installations that are not grid-interactive.
[2] Original equipment manufacturers are non-photovoltaic manufacturers that combine photovoltaic technology into existing or newly developed product lines.
[3] Photovoltaic cells to original equipment manufacturers.
[4] Photovoltaic cells and modules to original equipment manufacturers.
[5] Represents such applications as cooking food, desalinization, and distilling.
[6] Includes modules to original equipment manufacturers.
[7] Shipments to foreign governments and for specialty purposes.

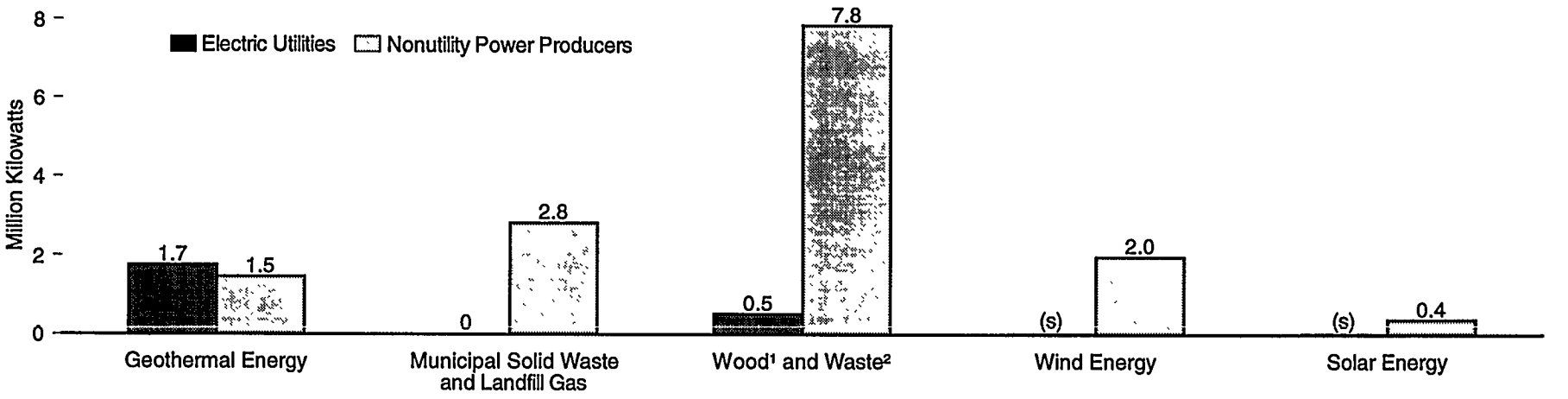
(s)=Less than 0.05 percent.

Note: Totals may not equal sum of components due to independent rounding.

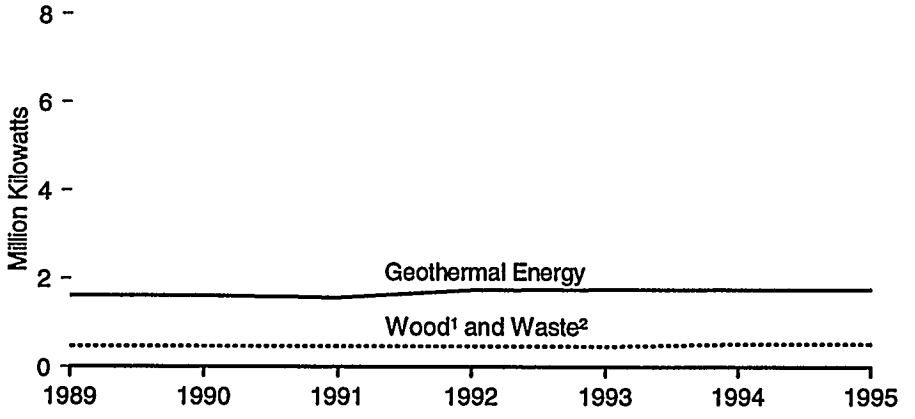
Sources: **1989:** Energy Information Administration (EIA), *Solar Collector Manufacturing Activity 1989* (March 1991), Tables 17 and 18. **1990:** EIA, *Solar Collector Manufacturing Activity 1991* (December 1992), Tables 22 and 23. **1991:** EIA, *Solar Collector Manufacturing Activity 1992* (November 1993), Tables 25 and 26. **1992:** EIA, *Solar Collector Manufacturing Activity 1993* (August 1994), Tables 23 and 24. **1993 and 1994:** EIA, *Renewable Energy Annual 1995* (December 1995), Table 38.

# Figure 10.8 Electric Power Industry Net Summer Capability by Selected Renewable Energy Resources

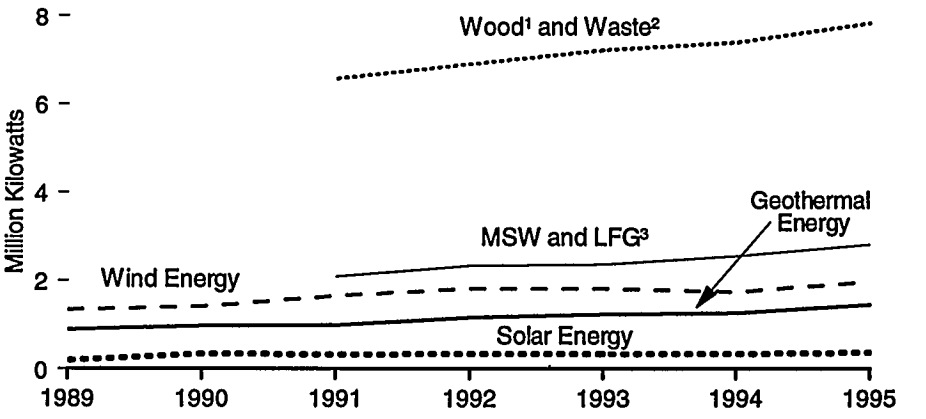
**Electric Utilities and Nonutility Power Producers, 1995**




**Electric Utilities, 1989-1995**




**Nonutility Power Producers, 1989-1995**




(s)=Less than 500 thousand kilowatts.
[1] Wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[2] Agricultural waste, straw, tires, fish oils, and other waste.
[3] Municipal solid waste and landfill gas.

Note: Conventional hydroelectric power is another important source of renewable energy; see Tables 8.2 and 8.3 for hydroelectric power data.
Source: Table 10.8.

# Table 10.8 Electric Power Industry Net Summer Capability by Selected Renewable Energy Resources, 1949-1995

(Thousand Kilowatts)

| Year | Geothermal Energy | | Municipal Solid Waste and Landfill Gas | | Wood[1] and Waste[2] | | Wind Energy | | Solar Energy | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] |
| 1949 | 0 | NA | 0 | NA | 13 | NA | 0 | NA | 0 | NA |
| 1950 | 0 | NA | 0 | NA | 13 | NA | 0 | NA | 0 | NA |
| 1951 | 0 | NA | 0 | NA | 13 | NA | 0 | NA | 0 | NA |
| 1952 | 0 | NA | 0 | NA | 37 | NA | 0 | NA | 0 | NA |
| 1953 | 0 | NA | 0 | NA | 37 | NA | 0 | NA | 0 | NA |
| 1954 | 0 | NA | 0 | NA | 37 | NA | 0 | NA | 0 | NA |
| 1955 | 0 | NA | 0 | NA | 37 | NA | 0 | NA | 0 | NA |
| 1956 | 0 | NA | 0 | NA | 37 | NA | 0 | NA | 0 | NA |
| 1957 | 0 | NA | 0 | NA | 64 | NA | 0 | NA | 0 | NA |
| 1958 | 0 | NA | 0 | NA | 64 | NA | 0 | NA | 0 | NA |
| 1959 | 0 | NA | 0 | NA | 64 | NA | 0 | NA | 0 | NA |
| 1960 | 11 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1961 | 11 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1962 | 11 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1963 | 24 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1964 | 24 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1965 | 24 | NA | 0 | NA | 64 | NA | NA | NA | 0 | NA |
| 1966 | 24 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1967 | 51 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1968 | 78 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1969 | 78 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1970 | 78 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1971 | 184 | NA | 0 | NA | 72 | NA | NA | NA | 0 | NA |
| 1972 | 290 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1973 | 396 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1974 | 396 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1975 | 502 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1976 | 502 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1977 | 502 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1978 | 502 | NA | 0 | NA | 77 | NA | NA | NA | 0 | NA |
| 1979 | 667 | NA | 0 | NA | 78 | NA | NA | NA | 0 | NA |
| 1980 | 909 | NA | 0 | NA | 78 | NA | NA | NA | 0 | NA |
| 1981 | 909 | NA | 0 | NA | 78 | NA | (s) | NA | 0 | NA |
| 1982 | 1,022 | NA | 0 | NA | 79 | NA | 6 | NA | 0 | NA |
| 1983 | 1,207 | NA | 0 | NA | 212 | NA | 6 | NA | 0 | NA |
| 1984 | 1,231 | NA | 0 | NA | 321 | NA | 17 | NA | 0 | NA |
| 1985 | 1,580 | NA | 0 | NA | 350 | NA | 18 | NA | 0 | NA |
| 1986 | 1,558 | NA | 0 | NA | 343 | NA | 19 | NA | 0 | NA |
| 1987 | 1,549 | NA | 0 | NA | 401 | NA | 25 | NA | 0 | NA |
| 1988 | 1,667 | NA | 0 | NA | 421 | NA | 7 | NA | 0 | NA |
| 1989 | 1,606 | 885 | 0 | ([4]) | 465 | [5]6,604 | (s) | 1,339 | 3 | 187 |
| 1990 | 1,614 | 969 | 0 | ([4]) | 464 | [5]7,558 | (s) | 1,405 | 3 | 335 |
| 1991 | 1,563 | 987 | 0 | 2,098 | 464 | [R]6,569 | (s) | 1,652 | 3 | 319 |
| 1992 | 1,739 | 1,171 | 0 | 2,334 | 464 | [R]6,903 | (s) | 1,822 | 3 | 335 |
| 1993 | 1,747 | 1,231 | 0 | 2,370 | 459 | [R]7,216 | 1 | 1,813 | 4 | 335 |
| 1994 | 1,747 | [R]1,259 | 0 | 2,550 | 516 | [R]7,400 | 8 | 1,737 | 4 | 329 |
| 1995 | 1,747 | 1,450 | 0 | 2,823 | 516 | 7,829 | 8 | 1,968 | 4 | 369 |

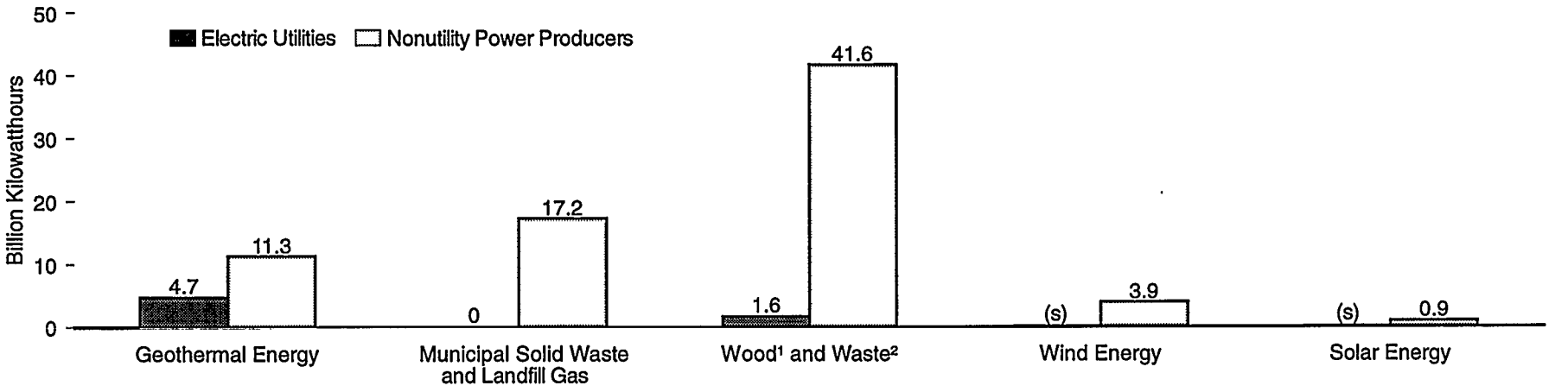
[1] Wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[2] Agricultural waste, straw, tires, fish oils, and other waste.
[3] Cogenerators, independent power producers, and small power producers of 1 megawatt or greater capacity.
[4] Included in "Wood and Waste."
[5] Includes "Municipal Solid Waste and Landfill Gas."
R=Revised data. P=Preliminary data. NA=Not available. (s)=Less than 500 kilowatts.

Notes: • Data are as of end of year. • For definition of net summer capability, see Glossary. • Conventional hydroelectric power is another source of renewable energy; see Tables 8.2 and 8.3 for hydroelectric power data.

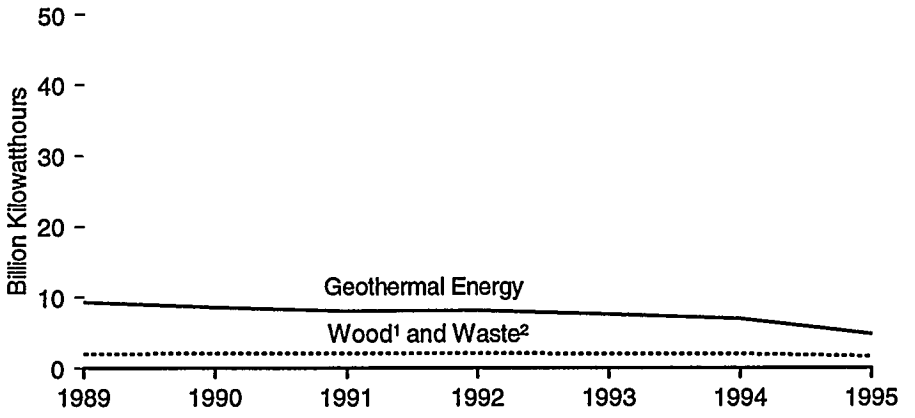
Sources: **Electric Utilities:** • 1960-1984—Energy Information Administration (EIA) estimates. • 1985 forward—EIA, Form EIA-860, "Annual Electric Generator Report." **Nonutility Power Producers:** Estimated by EIA, based on Form EIA-867, "Annual Nonutility Power Producer Report."

# Figure 10.9 Electric Power Industry Net Generation by Selected Renewable Energy Resources

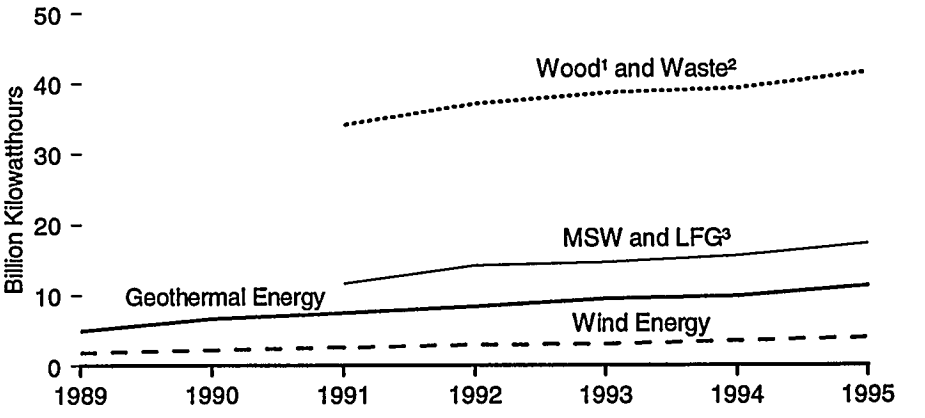
**Electric Utilities and Nonutility Power Producers, 1995**




**Electric Utilities, 1989-1995**




**Nonutility Power Producers, 1989-1995**




(s)=Less than 500 million kilowatthours.
¹ Wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
² Agricultural waste, straw, tires, fish oils, and other waste.
³ Municipal solid waste and landfill gas.

Note: Conventional hydroelectric power is another important source of renewable energy; see Tables 8.2 and 8.3 for hydroelectric power data.
Source: Table 10.9.

# Table 10.9 Electric Power Industry Net Generation by Selected Renewable Energy Resources, 1949-1995

(Million Kilowatthours)

| Year | Geothermal Energy | | Municipal Solid Waste and Landfill Gas | | Wood[1] and Waste[2] | | Wind Energy | | Solar Energy | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] | Electric Utilities | Nonutility Power Producers [3] |
| 1949 | 0 | NA | 0 | NA | 386 | NA | 0 | NA | 0 | NA |
| 1950 | 0 | NA | 0 | NA | 390 | NA | 0 | NA | 0 | NA |
| 1951 | 0 | NA | 0 | NA | 391 | NA | 0 | NA | 0 | NA |
| 1952 | 0 | NA | 0 | NA | 482 | NA | 0 | NA | 0 | NA |
| 1953 | 0 | NA | 0 | NA | 389 | NA | 0 | NA | 0 | NA |
| 1954 | 0 | NA | 0 | NA | 263 | NA | 0 | NA | 0 | NA |
| 1955 | 0 | NA | 0 | NA | 276 | NA | 0 | NA | 0 | NA |
| 1956 | 0 | NA | 0 | NA | 152 | NA | 0 | NA | 0 | NA |
| 1957 | 0 | NA | 0 | NA | 177 | NA | 0 | NA | 0 | NA |
| 1958 | 0 | NA | 0 | NA | 175 | NA | 0 | NA | 0 | NA |
| 1959 | 0 | NA | 0 | NA | 153 | NA | 0 | NA | 0 | NA |
| 1960 | 33 | NA | 0 | NA | 140 | NA | NA | NA | 0 | NA |
| 1961 | 94 | NA | 0 | NA | 126 | NA | NA | NA | 0 | NA |
| 1962 | 100 | NA | 0 | NA | 128 | NA | NA | NA | 0 | NA |
| 1963 | 168 | NA | 0 | NA | 128 | NA | NA | NA | 0 | NA |
| 1964 | 204 | NA | 0 | NA | 148 | NA | NA | NA | 0 | NA |
| 1965 | 189 | NA | 0 | NA | 269 | NA | NA | NA | 0 | NA |
| 1966 | 188 | NA | 0 | NA | 334 | NA | NA | NA | 0 | NA |
| 1967 | 316 | NA | 0 | NA | 316 | NA | NA | NA | 0 | NA |
| 1968 | 436 | NA | 0 | NA | 375 | NA | NA | NA | 0 | NA |
| 1969 | 615 | NA | 0 | NA | 320 | NA | NA | NA | 0 | NA |
| 1970 | 525 | NA | 0 | NA | 356 | NA | NA | NA | 0 | NA |
| 1971 | 548 | NA | 0 | NA | 311 | NA | NA | NA | 0 | NA |
| 1972 | 1,453 | NA | 0 | NA | 331 | NA | NA | NA | 0 | NA |
| 1973 | 1,966 | NA | 0 | NA | 328 | NA | NA | NA | 0 | NA |
| 1974 | 2,453 | NA | 0 | NA | 251 | NA | NA | NA | 0 | NA |
| 1975 | 3,246 | NA | 0 | NA | 191 | NA | NA | NA | 0 | NA |
| 1976 | 3,616 | NA | 0 | NA | 266 | NA | NA | NA | 0 | NA |
| 1977 | 3,582 | NA | 0 | NA | 481 | NA | NA | NA | 0 | NA |
| 1978 | 2,978 | NA | 0 | NA | 338 | NA | NA | NA | 0 | NA |
| 1979 | 3,889 | NA | 0 | NA | 498 | NA | NA | NA | 0 | NA |
| 1980 | 5,073 | NA | 0 | NA | 433 | NA | NA | NA | 0 | NA |
| 1981 | 5,686 | NA | 0 | NA | 368 | NA | NA | NA | 0 | NA |
| 1982 | 4,843 | NA | 0 | NA | 321 | NA | NA | NA | 0 | NA |
| 1983 | 6,075 | NA | 0 | NA | 379 | NA | 3 | NA | 0 | NA |
| 1984 | 7,741 | NA | 0 | NA | 886 | NA | 12 | NA | 0 | NA |
| 1985 | 9,325 | NA | 0 | NA | 1,383 | NA | 16 | NA | 0 | NA |
| 1986 | 10,308 | NA | 0 | NA | 1,177 | NA | 18 | NA | 0 | NA |
| 1987 | 10,775 | NA | 0 | NA | 1,477 | NA | 14 | NA | 0 | NA |
| 1988 | 10,300 | NA | 0 | NA | 1,674 | NA | 10 | NA | 0 | NA |
| 1989 | 9,342 | 4,895 | 0 | ([4]) | 1,965 | [5]34,694 | 3 | 1,814 | 0 | 474 |
| 1990 | 8,581 | 6,666 | 0 | ([4]) | 2,067 | [5]40,494 | (s) | 2,228 | 2 | 644 |
| 1991 | 8,087 | 7,420 | 0 | 11,595 | 2,046 | R34,130 | (s) | 2,579 | 3 | 756 |
| 1992 | 8,104 | 8,318 | 0 | 14,138 | 2,093 | R37,125 | (s) | 2,887 | 3 | 724 |
| 1993 | 7,571 | 9,454 | 0 | 14,633 | 1,990 | R38,685 | (s) | 3,022 | 4 | 870 |
| 1994 | R6,941 | R9,816 | 0 | 15,570 | 1,988 | R39,328 | (s) | 3,447 | 3 | 799 |
| 1995 | 4,745 | 11,309 | 0 | 17,240 | 1,649 | 41,571 | 11 | 3,906 | 4 | 897 |

[1] Wood, wood waste, peat, wood liquors, railroad ties, pitch, and wood sludge.
[2] Agricultural waste, straw, tires, fish oils, and other waste.
[3] Cogenerators, independent power producers, and small power producers of 1 megawatt or greater capacity.
[4] Included in "Wood and Waste."
[5] Includes "Municipal Solid Waste and Landfill Gas."
R=Revised data. NA=Not available. (s)=Less than 500 thousand kilowatthours.

Note: Conventional hydroelectric power is another source of renewable energy; see Tables 8.2 and 8.3 for hydroelectric power data.
Sources: **Electric Utilities:** • 1949-September 1977—Federal Power Commission, Form FPC-4, "Monthly Power Plant Report." • October 1977-1981—Federal Energy Regulatory Commission, Form FPC-4, "Monthly Power Plant Report." • 1982 forward—Energy Information Administration (EIA), Form EIA-759, "Monthly Power Plant Report." **Nonutility Power Producers:** Estimated by EIA, based on Form EIA-867, "Annual Nonutility Power Producer Report."

# 11. International Energy

## World Leaders in Energy Production

Worldwide energy production of 355 quadrillion Btu in 1994 was 51 quadrillion Btu greater than in 1985 (11.1).* The relative contributions of the four leading energy producers changed markedly over the 10-year period.

In 1985, the United States was the leading producer of energy and U.S. production of 65 quadrillion Btu accounted for 21.3 percent of the world total. The former U.S.S.R., the second leading producer, accounted for 63 quadrillion Btu, a 20.7 percent share. In 1986, the former U.S.S.R.'s production surpassed U.S. production for the first time and remained higher than U.S. production through 1989. In 1990, however, former U.S.S.R. production of 69 quadrillion Btu was lower than U.S. production of 71 quadrillion Btu.

As of December 31, 1991, the U.S.S.R. ceased to exist as a political entity. Three of the U.S.S.R.'s constituent republics (Russia, Ukraine, and Kazakstan) together produced 47 quadrillion Btu of energy in 1994. That year the United States produced 71 quadrillion Btu.

Energy production in China, the third largest producer of energy in 1985, increased throughout the 10-year period. In 1985, China produced 24 quadrillion Btu of energy, much of which was coal. By 1994, Chinese production had reached 34 quadrillion Btu.

At 8.6 quadrillion Btu, Saudi Arabia was the sixth largest producer of energy in 1985. That year marked a low point in Saudi Arabian production, brought on by a cutback in petroleum production intended to allow Saudi Arabia to regain control of world oil markets. During the remainder of the 10-year period, however, Saudi Arabian energy production exhibited the greatest growth, in absolute terms. By 1994, it had risen to 20 quadrillion Btu, making Saudi Arabia the fourth largest producer of energy.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Crude Oil Production in 1995

World production of crude oil totaled 62.23 million barrels per day in 1995, up 2.2 percent from the 1994 level (11.5). The most noticeable production increases occurred in Venezuela and the United Kingdom. Small production declines occurred in the United States, where production fell from 6.66 million barrels per day in 1994 to 6.53 million barrels per day in 1995, and in Mexico, where production declined from 2.69 million barrels per day to 2.62 million barrels per day. In Saudi Arabia, the largest producer of crude oil in 1995, production rose slightly to 8.23 million barrels per day. Crude oil production by all members of the Organization of Petroleum Exporting Countries combined rose to 26.48 million barrels per day and accounted for 43 percent of the world total in 1995.

## Natural Gas Production in 1994

World production of dry natural gas totaled 77 trillion cubic feet (11.11) and, on a Btu basis, equaled 22 percent of world energy production in 1994 (11.2). Natural gas production in 1994 was 1.1 percent above the 1993 level (11.11). Russia was the major producer of natural gas in 1994 and accounted for 21 trillion cubic feet, a 28-percent share of the world total. The United States was the second largest producer and accounted for 19 trillion cubic feet, a 24-percent share.

## Coal Production in 1994

World production of coal totaled 5.0 billion short tons (11.15) and, on a Btu basis, equaled 25 percent of world energy production in 1994 (11.2). That level of coal production was 1.8 percent above the 1993 level (11.15). China, the leading producer, accounted for 1.4 billion short tons in 1994. Coal production in the United States, the second leading producer, totaled 1.0 billion short tons, a record level. Germany and India each accounted for 295 million short tons, and Russia accounted for 294 million short tons.

## Installed Capacity and Electricity Generation

As of January 1, 1994, world electricity installed capacity at all sites (including nonutility power producers) totaled 2.8 billion kilowatts (11.18). Most of the capacity (66 percent) was fossil fuel-fired. Hydroelectric generating capacity accounted for 21 percent and nuclear electric generating capacity accounted for 12 percent. Renewable sources, such as biofuels and geothermal, solar, and wind energy, accounted for less than 1 percent of the world total.

***In real terms, the 1994 average price of crude oil was the second lowest in 21 years.***

World fossil fuel-fired net generation totaled 7.6 trillion kilowatthours in 1993 (11.17). The United States, with 2.4 trillion kilowatthours, was by far the largest producer of fossil fuel-fired net generation. China's net generation totaled 645 billion kilowatthours and Russia's totaled 623 billion kilowatthours. World hydroelectric power net generation in 1994 totaled 2.3 trillion kilowatthours, down slightly from the 1993 level (11.19). Canada, the United States, Brazil, Russia, and China were the world leaders in hydroelectric power net generation and together accounted for 50 percent of the world total. In 1995, nuclear-based electricity gross generation totaled 2.3 trillion kilowatthours (11.20). The U.S. share of the world total was 31 percent. France accounted for 17 percent and Japan for 13 percent of the world total.

## Fluctuations in Petroleum Prices and Demand

In 1973, the expanding post-World War II petroleum market reached 57 million barrels per day (11.9). At that point, oil-producing nations became able, for the first time, to exploit the relative inelasticity of petroleum demand in the short term by raising prices substantially. In response, petroleum consumption dipped for 2 years before resuming its climb to 65 million barrels per day in 1979.

A steep price hike in 1979 and 1980, combined with the longer-term effects of fuel switching and increased efficiency, began to curb consumption, even as the higher prices stimulated new sources of production. World petroleum consumption had fallen to 59 million barrels per day in 1983 when lowered demand and excess production began to erode the price of oil (11.9). In 1986, the price of crude oil plunged 46 percent to $14.55 per barrel (5.19). Prices stayed low in the second half of the 1980's and petroleum consumption reached 66 million barrels per day, a record level at the time, in 1989.

Following Iraq's invasion of Kuwait in August 1990, the average price of crude oil rose to $22.22 per barrel, the highest in 5 years (5.19), and year-to-year growth in world petroleum consumption of only 0.2 percent was the lowest in those years (11.9). In 1991, following the resolution of the war in the Persian Gulf, the average price of crude oil fell to $19.06 per barrel. World consumption of petroleum rose 0.8 percent to 67 million barrels per day. In 1992 through 1994, the average price of crude oil fell further, reaching $15.59 per barrel. In real terms, the 1994 price was the lowest in 21 years. Reflecting the price decline, world consumption of petroleum rose to 68 million barrels per day.

From 1960 through 1994, the United States consumed more petroleum by far than any other country (11.9). In 1994, U.S. consumption accounted for 42 percent of the 42 million barrels per day consumed by the Organization for Economic Cooperation and Development (OECD) countries. Japan consumed 5.7 million barrels per day. Of the non-OECD countries, Russia and China were the biggest consumers, accounting for 3.3 million barrels per day and 3.2 million barrels per day, respectively.

### Petroleum Stocks in OECD Countries

Following the oil supply disruptions in the mid-1970's, petroleum stocks held by members of the Organization for Economic Cooperation and Development (OECD) trended upward (11.10). In 1973, OECD petroleum stocks totaled 2.6 billion barrels. At the end of 1994, stocks were 3.7 billion barrels. Throughout the 22-year period, the United States held the largest share of total OECD stocks. U.S. petroleum stocks in 1973 totaled 1.0 billion barrels, a 39-percent share. In 1994, U.S. petroleum stocks of 1.7 billion barrels equaled a 44-percent share. Japan more than doubled its petroleum stocks over the same period, from 303 million barrels in 1973 to 645 million barrels in 1994.

## Dry Natural Gas Consumption in 1994

Although natural gas can be transported across borders in pipelines and some natural gas is shipped as liquefied natural gas, in general, natural gas tends to be consumed closer to its site of production than does petroleum. Not surprisingly, the two top producers of dry natural gas in 1994 were also the top consumers (11.11 and 11.13). U.S. consumption of dry natural gas totaled 21 trillion cubic feet, equal to 111 percent of its production. Russia consumed 15 trillion cubic feet, an amount equal to 70 percent of its production of dry natural gas. Ukraine, the third largest consumer of natural gas, consumed 3.1 trillion cubic feet and Germany consumed 3.0 trillion cubic feet.

## Coal Consumption in 1994

World coal consumption in 1994 totaled 5.0 billion short tons, up slightly from the level of consumption in 1993 (11.16). China, the United States, and Germany, three of the world's leading producers of coal (11.15), were the leading consumers. China consumed 1.4 billion short tons, the United States consumed 930 million short tons, and Germany consumed 316 million short tons of coal in 1994.

## Energy Reserves

As of January 1, 1995, world crude oil reserves were estimated to equal about 999 billion barrels (11.3).[1] Almost two-thirds of the reserves were located in the Middle East, especially in Saudi Arabia, where about 40 percent of the region's reserves were estimated to be. Iraq, the United Arab Emirates, Kuwait, and Iran each were estimated to have more crude oil reserves than entire regions in the rest of the world. Outside of the Middle East, three countries were estimated to have very large reserves: the former U.S.S.R., 57 billion barrels; Venezuela, 65 billion barrels; and Mexico, 51 billion barrels. The United States, at 23 billion barrels, ranked eleventh in the world in amount of crude oil reserves.

The distribution of the world's 5.0 quadrillion cubic feet of natural gas reserves was different from the distribution of crude oil reserves (11.3). Former U.S.S.R. reserves of 2.0 quadrillion cubic feet made the Eastern Europe and former U.S.S.R. region first in the world in amount of natural gas reserves. The Middle East was estimated to have reserves of 1.6 quadrillion cubic feet, primarily in Iran, as well as in Qatar, the United Arab Emirates, Saudi Arabia, and Iraq. The United States, at 164 trillion cubic feet, ranked sixth in the world in amount of natural gas reserves.

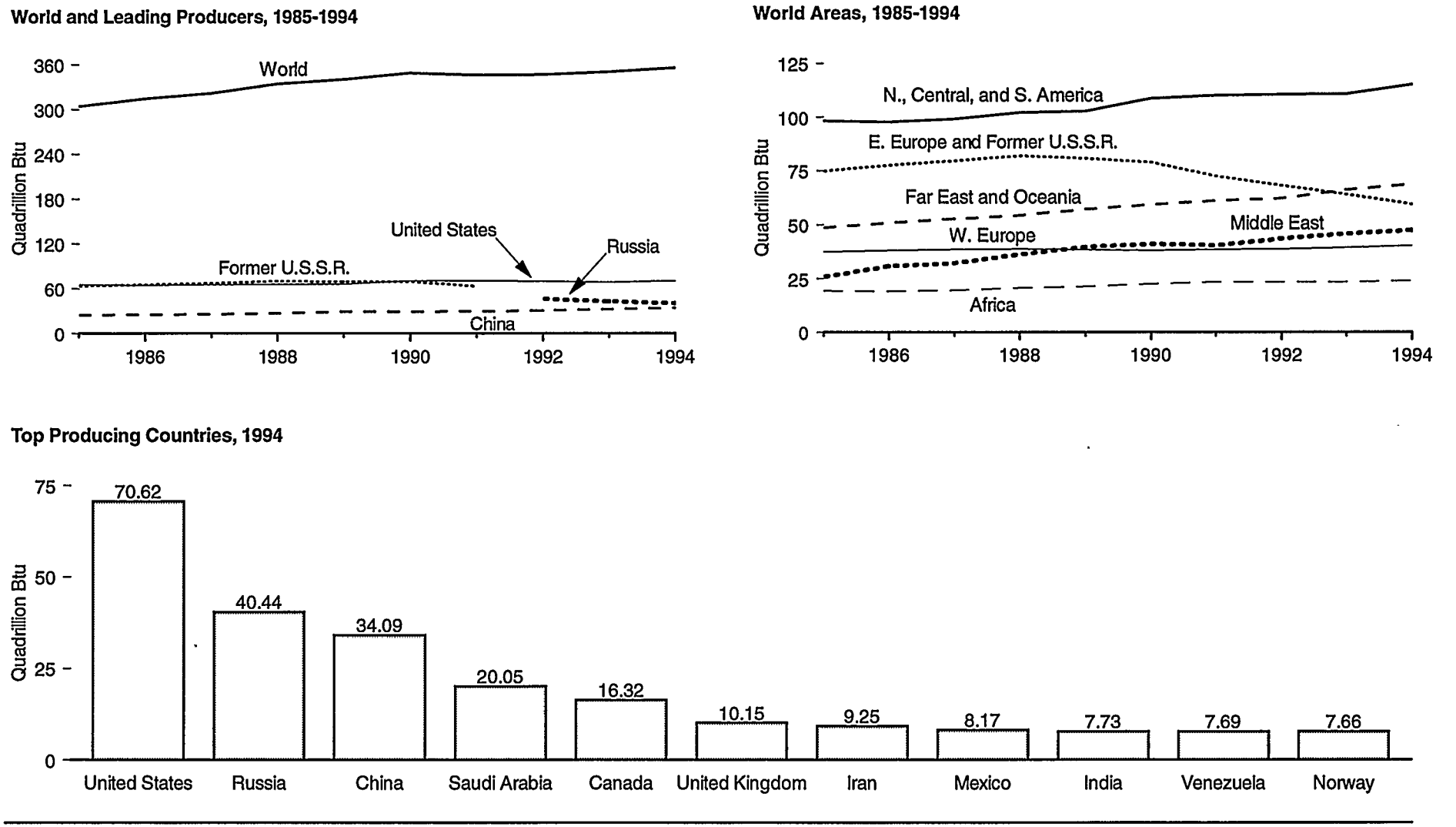
As of the end of 1993, recoverable reserves of coal were estimated to be 1.1 trillion short tons (11.14).[2] The three countries with the most plentiful coal reserves were the United States, with 268 billion short tons[3]; the former U.S.S.R., with 265 billion short tons; and China, with 126 billion short tons.

[1] *Oil and Gas Journal* data.

[2] World Energy Council data, with the exception of U.S. data, which are estimated by the Energy Information Administration. Data for the former U.S.S.R. and China are as of December 31, 1993, the most recent period for which they are available.

[3] U.S. data are more current; they represent recoverable reserves as of December 31, 1994.

# Figure 11.1 World Primary Energy Production




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.1.

# Table 11.1 World Primary Energy Production, 1985-1994

(Quadrillion Btu)

| Region and Country | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 P |
|---|---|---|---|---|---|---|---|---|---|---|
| **North, Central, and South America** | R98.15 | R97.85 | R99.21 | R102.16 | R102.76 | R108.70 | R110.14 | R110.60 | R110.85 | 115.13 |
| Brazil | 3.45 | 3.55 | 3.57 | 3.67 | 3.84 | 3.87 | 4.03 | 4.10 | 4.25 | 4.40 |
| Canada | 11.97 | 11.91 | 12.54 | 13.41 | 13.36 | R13.35 | R13.89 | 14.42 | R15.36 | 16.32 |
| Mexico | R7.73 | R7.11 | R7.32 | R7.37 | R7.44 | R7.89 | R8.16 | R8.17 | R8.14 | 8.17 |
| United States [1] | 64.87 | 64.35 | 64.95 | 66.10 | 66.13 | R,170.75 | R70.41 | R69.96 | 68.32 | 70.62 |
| Venezuela | 4.78 | 5.18 | 5.14 | 5.55 | 5.73 | R6.31 | 6.97 | R6.96 | R7.29 | 7.69 |
| Other | R5.34 | R5.74 | R5.69 | R6.05 | R6.27 | R6.54 | R6.69 | R7.00 | R7.50 | 7.92 |
| **Western Europe** | R37.30 | R38.11 | R38.54 | R38.75 | R38.40 | R38.14 | R38.54 | R38.80 | R39.42 | 40.27 |
| France | R3.60 | R3.85 | R4.02 | 4.07 | R4.05 | R4.22 | R4.43 | R4.59 | R4.75 | 4.76 |
| Germany [2] | 8.13 | 7.92 | 7.94 | 7.98 | 7.77 | R7.16 | R6.30 | 6.11 | R5.86 | 5.59 |
| Netherlands | 2.92 | 2.74 | 2.73 | 2.42 | 2.60 | R2.62 | 2.94 | 2.92 | 2.96 | 2.90 |
| Norway | 3.77 | R3.94 | 4.40 | 4.77 | 5.71 | 5.94 | 6.23 | 7.08 | R7.27 | 7.66 |
| United Kingdom | 10.20 | 10.64 | 10.32 | R9.99 | 9.02 | 8.96 | 9.26 | R9.03 | R9.38 | 10.15 |
| Other | R8.68 | R9.01 | R9.13 | R9.51 | R9.25 | R9.23 | R9.39 | R9.07 | R9.19 | 9.22 |
| **Eastern Europe and Former U.S.S.R.** | R74.96 | R77.63 | R79.67 | R82.02 | R80.83 | R78.93 | R72.53 | R68.25 | R64.15 | 59.67 |
| Kazakstan | — | — | — | — | — | — | — | 3.76 | R3.43 | 2.57 |
| Poland | R4.93 | R4.98 | R5.04 | R5.04 | R4.67 | R3.89 | R3.75 | R3.69 | R3.71 | 3.78 |
| Russia | — | — | — | — | — | — | — | R46.19 | R42.58 | 40.44 |
| Ukraine | — | — | — | — | — | — | — | R4.27 | R4.12 | 3.61 |
| Former U.S.S.R. | 62.94 | 65.41 | 67.33 | R69.72 | 69.25 | R69.15 | R63.54 | — | — | — |
| Other | R7.09 | R7.25 | R7.30 | R7.26 | R6.91 | R5.89 | R5.24 | R10.34 | R10.30 | 9.27 |
| **Middle East** | 25.77 | 30.75 | 32.21 | 36.12 | 39.72 | R41.04 | R40.33 | R43.59 | R45.80 | 47.39 |
| Iran | 5.59 | 5.06 | 5.67 | 5.71 | R7.02 | R7.68 | R8.28 | R8.54 | R8.86 | 9.25 |
| Iraq | 3.09 | 3.66 | 4.58 | 5.97 | 6.47 | 4.54 | 0.69 | 1.02 | R1.21 | 1.33 |
| Kuwait | 2.44 | 3.36 | 3.77 | 3.63 | 4.32 | 2.83 | 0.43 | 2.44 | R4.28 | 4.75 |
| Saudi Arabia | 8.64 | 12.04 | 10.84 | R12.85 | 12.81 | 15.92 | 19.75 | 20.39 | 20.11 | 20.05 |
| United Arab Emirates | 3.29 | 3.68 | 4.21 | 4.22 | 4.99 | 5.51 | R6.24 | 6.11 | R5.78 | 6.03 |
| Other | 2.72 | 2.95 | 3.14 | 3.74 | R4.12 | R4.56 | R4.95 | R5.09 | R5.55 | 5.97 |
| **Africa** | 19.29 | R19.08 | 19.45 | R20.57 | R21.41 | R22.42 | R23.41 | R23.50 | R23.46 | 24.05 |
| Algeria | 3.77 | 3.55 | 4.01 | 4.07 | 4.28 | 4.52 | 4.81 | 4.82 | R4.65 | 4.54 |
| Libya | 2.46 | 2.43 | 2.29 | 2.73 | 2.70 | 3.18 | R3.43 | 3.34 | R3.17 | 3.21 |
| Nigeria | 3.36 | 3.31 | 3.05 | 3.29 | 3.89 | 4.06 | 4.27 | 4.40 | R4.43 | 4.58 |
| South Africa | 5.01 | R5.14 | R5.11 | R5.31 | R5.17 | 5.08 | R5.19 | R5.08 | R5.35 | 5.77 |
| Other | R4.69 | R4.64 | 4.99 | 5.15 | R5.37 | R5.58 | 5.72 | R5.86 | R5.87 | 5.96 |
| **Far East and Oceania** | R48.69 | R50.79 | R52.62 | R54.37 | R57.17 | R59.45 | R61.11 | R62.39 | R66.19 | 68.98 |
| Australia | R4.87 | R5.15 | 5.60 | R5.33 | R5.58 | R6.14 | R6.28 | R6.56 | R6.59 | 6.76 |
| China | R24.25 | R24.99 | R25.89 | 27.10 | 28.72 | R29.33 | 29.63 | R30.31 | R32.28 | 34.09 |
| India | R5.26 | R5.65 | R5.60 | R5.90 | R6.20 | R6.53 | R6.80 | R6.97 | R7.46 | 7.73 |
| Indonesia | R4.26 | R4.35 | R4.39 | R4.49 | R4.88 | R5.19 | R5.75 | R5.87 | R6.24 | 6.57 |
| Japan | 2.99 | 2.98 | 3.22 | 3.21 | 3.19 | R3.17 | 3.42 | 3.31 | R3.72 | 3.68 |
| Other | R7.07 | R7.67 | R7.92 | R8.34 | R8.59 | R9.09 | R9.23 | R9.38 | R9.90 | 10.15 |
| **World** | R304.16 | R314.21 | R321.71 | R333.99 | R340.29 | R348.68 | R346.08 | R347.15 | R349.87 | 355.49 |

[1] There is a discontinuity in this time series between 1989 and 1990 due to the expanded coverage of non-electric utility use of renewable energy beginning in 1990.

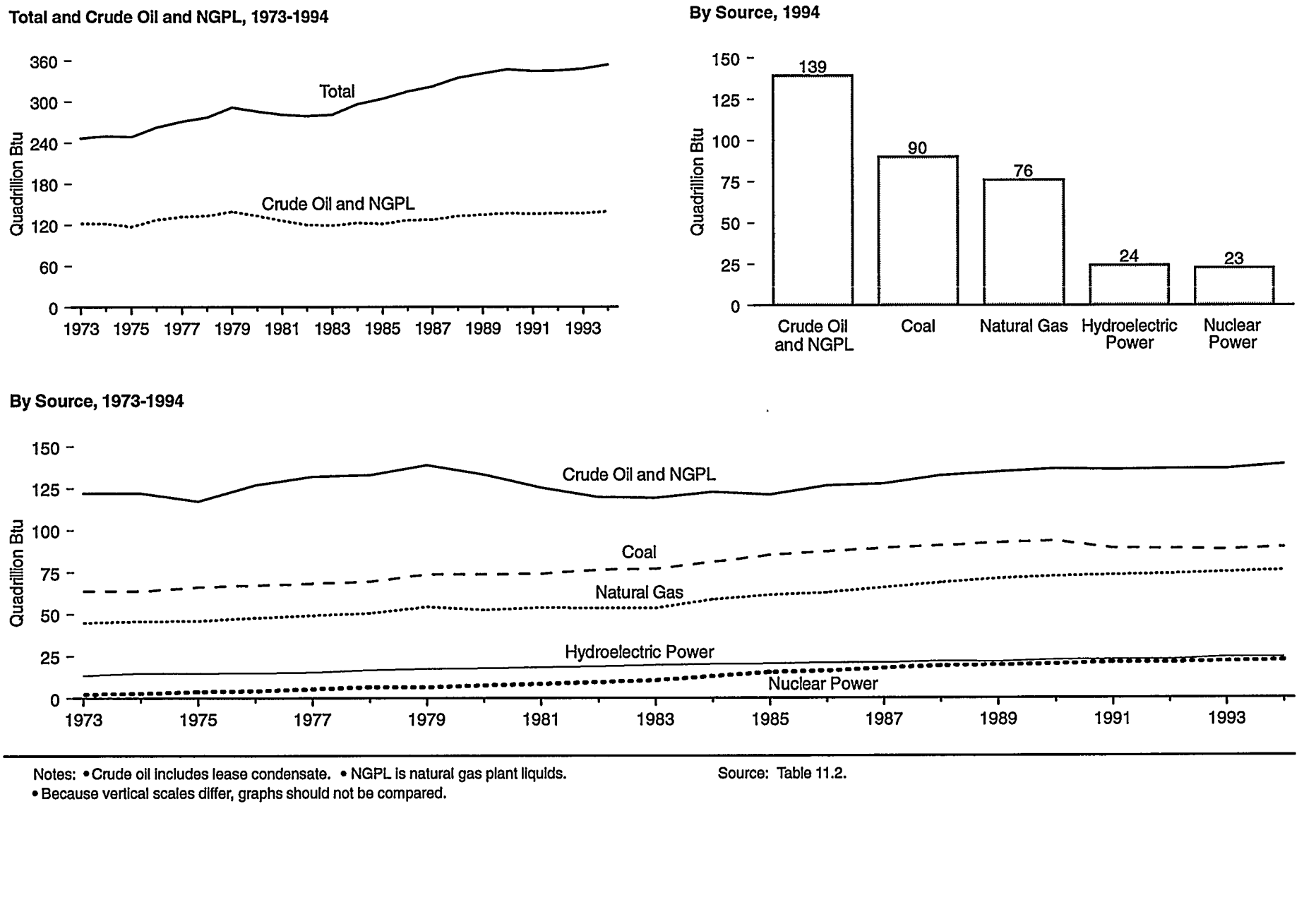
[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

R=Revised data. P=Preliminary data. — = Not applicable.

Notes: • See Note 1 at end of section. • World primary energy production includes crude oil and lease condensate, natural gas plant liquids, dry natural gas, coal, and net hydroelectric power, nuclear electric power, geothermal, solar, and wind electric power. Data for the United States also include electricity generated from biofuels. • Totals may not equal sum of components due to independent rounding.

Sources: **United States:** Table 1.2. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.2 World Primary Energy Production by Source




Notes: • Crude oil includes lease condensate. • NGPL is natural gas plant liquids.
• Because vertical scales differ, graphs should not be compared.

Source: Table 11.2.

# Table 11.2 World Primary Energy Production by Source, 1973-1994

(Quadrillion Btu)

| Year | Coal | Natural Gas [1] | Crude Oil [2] | Natural Gas Plant Liquids | Nuclear Power [3] | Hydroelectric Power [3] | Geothermal Energy [3] and Other [4] | Total [5] |
|---|---|---|---|---|---|---|---|---|
| 1973 | 63.87 | 45.00 | R117.88 | 4.23 | 2.15 | 13.52 | 0.21 | R246.86 |
| 1974 | 63.79 | 45.82 | R117.82 | 4.22 | 2.87 | 14.84 | 0.22 | R249.57 |
| 1975 | 66.20 | 46.17 | R113.09 | 4.12 | 3.85 | 15.04 | 0.24 | R248.70 |
| 1976 | 67.33 | 48.14 | R122.92 | 4.24 | 4.52 | 15.08 | 0.26 | R262.49 |
| 1977 | 68.47 | 49.35 | R127.75 | 4.40 | 5.41 | 15.56 | 0.27 | R271.21 |
| 1978 | 69.55 | 50.79 | R128.51 | 4.55 | 6.43 | 16.80 | 0.28 | R276.91 |
| 1979 | 73.80 | 54.44 | R133.87 | 4.87 | 6.69 | 17.69 | 0.34 | R291.70 |
| 1980 | R73.82 | 52.65 | 128.12 | R5.09 | 7.58 | R18.04 | 0.40 | R285.69 |
| 1981 | R74.07 | 53.87 | 120.16 | 5.36 | 8.53 | 18.34 | 0.43 | R280.75 |
| 1982 | R76.60 | 53.48 | 114.51 | 5.34 | 9.51 | 18.82 | 0.44 | R278.71 |
| 1983 | R76.93 | 53.76 | 113.97 | 5.34 | 10.72 | R19.73 | 0.49 | R280.95 |
| 1984 | R81.15 | 58.79 | 116.86 | R5.70 | 13.00 | R20.34 | 0.56 | R296.39 |
| 1985 | R85.04 | 61.38 | 115.40 | 5.82 | 15.37 | R20.55 | 0.60 | R304.16 |
| 1986 | R87.20 | R62.62 | 120.24 | 6.12 | 16.34 | 20.96 | 0.73 | R314.21 |
| 1987 | R89.04 | 65.61 | 121.16 | 6.32 | 17.80 | 21.03 | 0.75 | R321.71 |
| 1988 | R90.75 | R68.79 | 125.93 | R6.62 | 19.30 | R21.84 | R0.76 | R333.99 |
| 1989 | R92.21 | R71.21 | 127.98 | 6.68 | 19.82 | R21.72 | R1.25 | R340.86 |
| 1990 | R93.35 | R72.57 | 129.50 | 6.85 | R20.27 | R22.60 | R1.36 | R346.51 |
| 1991 | R89.04 | R73.33 | 128.77 | R7.13 | 21.27 | R22.96 | R1.45 | R343.95 |
| 1992 | R88.78 | R73.84 | R129.13 | R7.35 | R21.29 | R22.98 | R1.54 | R344.93 |
| 1993 | R88.23 | R74.99 | R128.87 | R7.65 | R22.00 | R24.36 | R1.60 | R347.70 |
| 1994P | 89.75 | 76.02 | 131.24 | 7.85 | 22.53 | 24.30 | 1.60 | 353.29 |

[1] Dry production.
[2] Includes lease condensate.
[3] Net generation, i.e., gross generation less plant use.
[4] Includes biomass, wind, wood, photovoltaic, and solar thermal energy; excludes electricity generated from biofuels in the United States.
[5] Excludes electricity generated from biofuels in the United States. Totals, particularly for recent years, may differ from world totals presented on Table 11.1, which include such electricity.

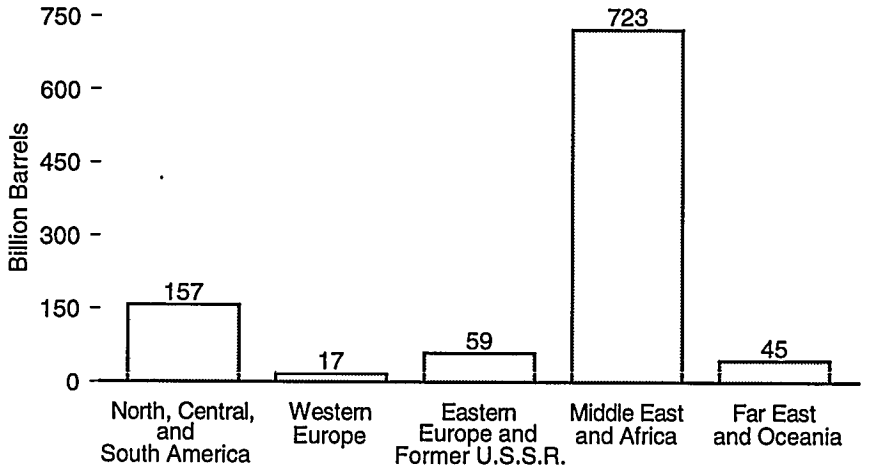
R=Revised data. P=Preliminary data.

Notes: • See Note 1 at end of section. • Totals may not equal sum of components due to independent rounding.

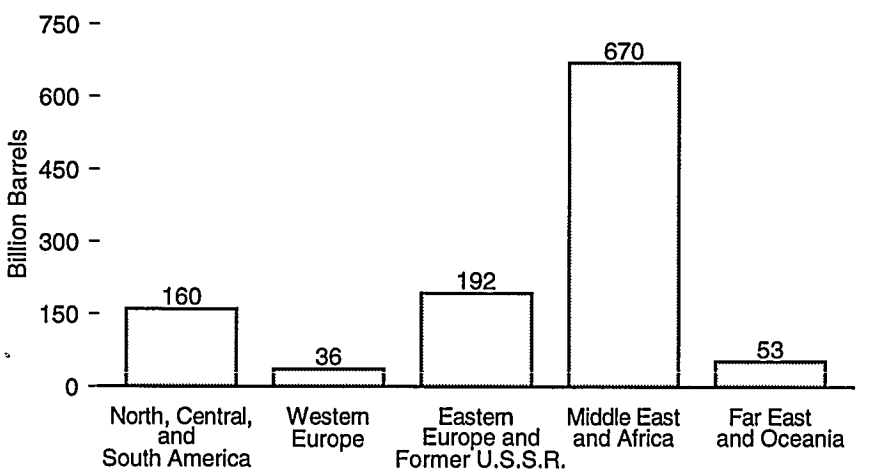
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

## Figure 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1995

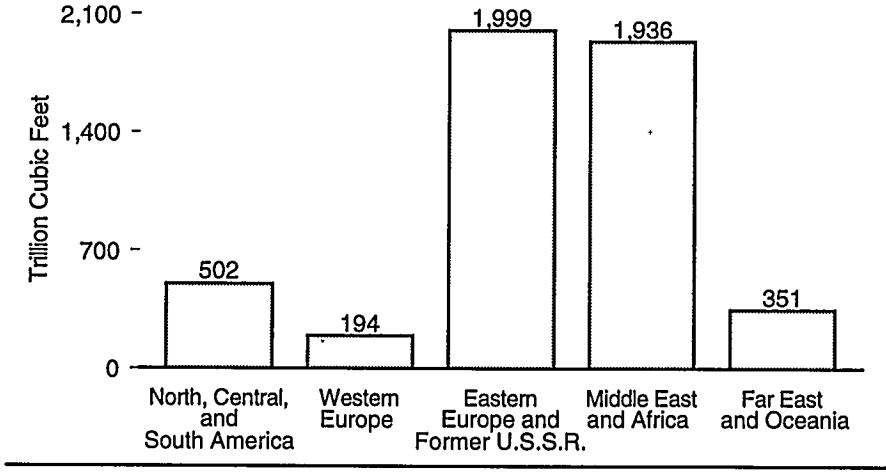
**Oil Reserves: *Oil and Gas Journal***



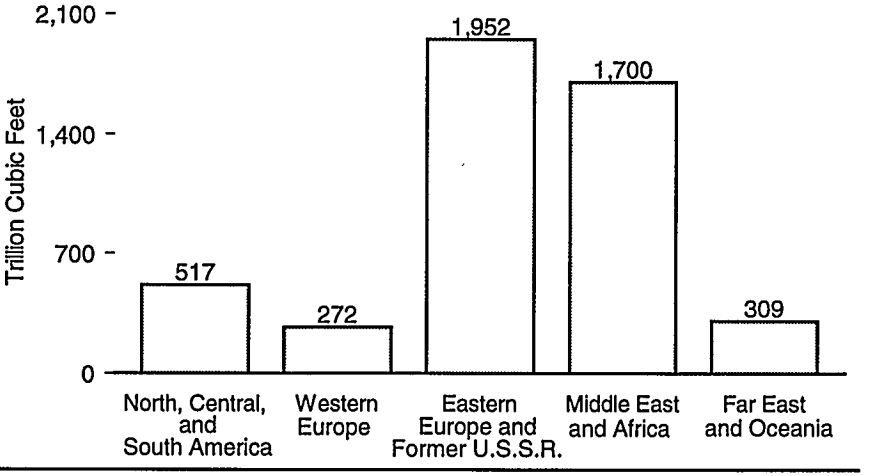

**Oil Reserves: *World Oil***




**Natural Gas Reserves: *Oil and Gas Journal***




**Natural Gas Reserves: *World Oil***




Source: Table 11.3.

# Table 11.3 World Crude Oil and Natural Gas Reserves, January 1, 1995

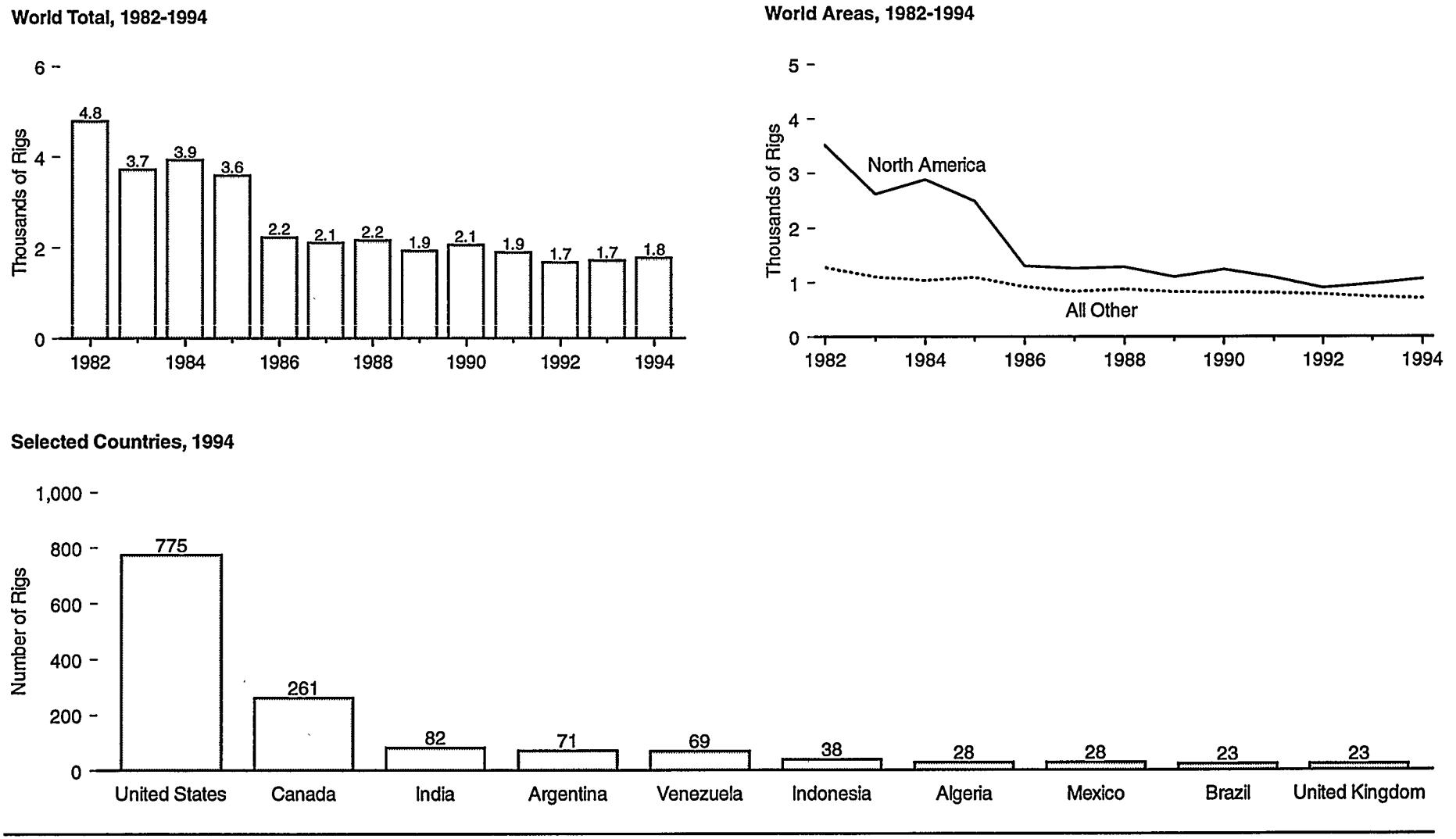
| Region and Country | Crude Oil (billion barrels) | | Natural Gas (trillion cubic feet) | |
|---|---|---|---|---|
| | *Oil and Gas Journal* | *World Oil* | *Oil and Gas Journal* | *World Oil* |
| **North America** | **78.3** | **78.1** | **312.7** | **312.4** |
| Canada | 5.0 | 5.8 | 79.2 | 80.1 |
| Mexico | 50.8 | 49.8 | 69.7 | 68.4 |
| United States | 22.5 | 22.5 | 163.8 | 163.8 |
| **Central and South America** | **78.3** | **82.0** | **189.1** | **204.4** |
| Argentina | 2.2 | 2.2 | 18.2 | 19.6 |
| Bolivia | 0.1 | 0.1 | 4.5 | 3.8 |
| Brazil | 3.8 | 4.2 | 4.9 | 5.5 |
| Colombia | 3.4 | 5.0 | 7.9 | 10.0 |
| Ecuador | 2.0 | 3.0 | 3.8 | 3.9 |
| Peru | 0.8 | 1.2 | 7.0 | 7.1 |
| Trinidad and Tobago | 0.5 | 0.6 | 8.5 | 10.8 |
| Venezuela | 64.5 | 64.9 | 130.4 | 140.0 |
| Other | 1.0 | 0.8 | 4.0 | 3.7 |
| **Western Europe** | **16.8** | **35.5** | **194.3** | **271.9** |
| Denmark | 0.7 | 0.8 | 4.3 | 4.9 |
| Germany | 0.4 | 0.3 | 10.7 | 12.5 |
| Italy | 0.6 | 0.7 | 13.2 | 11.1 |
| Netherlands | 0.1 | 0.4 | 66.2 | 70.5 |
| Norway | 9.4 | 17.0 | 70.9 | 101.2 |
| United Kingdom | 4.5 | 15.5 | 22.2 | 67.6 |
| Other | 1.0 | 0.8 | 6.7 | 4.2 |
| **Eastern Europe and Former U.S.S.R.** | **59.0** | **192.4** | **1,999.0** | **1,951.8** |
| Hungary | 0.1 | 0.1 | 3.5 | 3.5 |
| Romania | 1.6 | 1.0 | 12.3 | 4.6 |
| Former U.S.S.R. | 57.0 | 191.1 | 1,977.0 | 1,937.0 |
| Other [1] | 0.2 | 0.2 | 6.3 | 6.7 |
| **Middle East** | **660.3** | **597.6** | **1,594.3** | **1,383.7** |
| Bahrain | 0.2 | 0.1 | 5.3 | 5.6 |
| Iran | 89.3 | 58.7 | 741.6 | 620.0 |
| Iraq | 100.0 | 99.4 | 109.5 | 108.0 |
| Kuwait | 96.5 | 97.7 | 52.9 | 51.1 |
| Oman | 4.8 | 5.0 | 22.2 | 25.3 |
| Qatar | 3.7 | 4.9 | 250.0 | 164.0 |
| Saudi Arabia | 261.2 | 262.5 | 185.9 | 188.9 |
| Syria | 2.5 | 2.7 | 7.0 | 7.0 |
| United Arab Emirates | 98.1 | 63.4 | 204.6 | 198.7 |
| Yemen | 4.0 | 3.4 | 15.0 | 15.0 |
| Other | 0.0 | 0.0 | 0.2 | 0.2 |
| **Africa** | **62.2** | **72.8** | **341.6** | **316.6** |
| Algeria | 9.2 | 10.2 | 128.0 | 102.0 |
| Angola | 5.4 | 2.0 | 1.8 | 2.0 |
| Cameroon | 0.4 | 0.3 | 3.9 | 3.9 |
| Congo | 0.8 | 0.6 | 2.7 | 2.7 |
| Egypt | 3.3 | 3.4 | 19.3 | 21.0 |
| Libya | 22.8 | 36.6 | 45.8 | 45.2 |
| Nigeria | 17.9 | 17.2 | 120.0 | 120.8 |
| Tunisia | 0.4 | 0.3 | 1.1 | 1.2 |
| Other | 2.0 | 2.3 | 19.0 | 17.8 |
| **Far East and Oceania** | **44.5** | **52.9** | **350.6** | **309.0** |
| Australia | 1.6 | 1.9 | 19.6 | 20.8 |
| Brunei | 1.4 | 1.2 | 14.0 | 12.9 |
| China | 24.0 | 30.2 | 59.0 | 45.5 |
| India | 5.8 | 5.8 | 25.0 | 24.2 |
| Indonesia | 5.8 | 6.3 | 64.4 | 64.9 |
| Malaysia | 4.3 | 5.1 | 68.0 | 80.8 |
| New Zealand | 0.1 | 0.1 | 3.0 | 2.9 |
| Pakistan | 0.2 | 0.2 | 27.5 | 21.1 |
| Papua New Guinea | 0.2 | 0.5 | 15.0 | 0.0 |
| Thailand | 0.2 | 0.2 | 6.2 | 5.9 |
| Other | 0.8 | 1.5 | 49.0 | 30.0 |
| **World** | **999.3** | **1,111.3** | **4,981.7** | **4,749.8** |

[1] Albania, Bulgaria, former Czechoslovakia, and Poland.

Notes: • Data for Kuwait and Saudi Arabia include one-half of the reserves in the Neutral Zone between Kuwait and Saudi Arabia. • All reserve figures except those for the former U.S.S.R. and natural gas reserves in Canada are proved reserves recoverable with present technology and prices. Former U.S.S.R. figures are "explored reserves," which include proved, probable, and some partially possible. The Canadian natural gas figure includes proved and some probable. The latest Energy Information Administration data for the United States are for December 31, 1994. See Table 4.8. • Totals may not equal sum of components due to independent rounding.

Sources: **United States:** Energy Information Administration (EIA), *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1994 Annual Report* (October 1995). **All Other Data:** PennWell Publishing Company, *Oil and Gas Journal*, December 26, 1994. Gulf Publishing Company, *World Oil*, August 1995.

## Figure 11.4 World Rotary Rigs in Operation




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.4.

# Table 11.4 World Rotary Rigs in Operation, 1982-1994

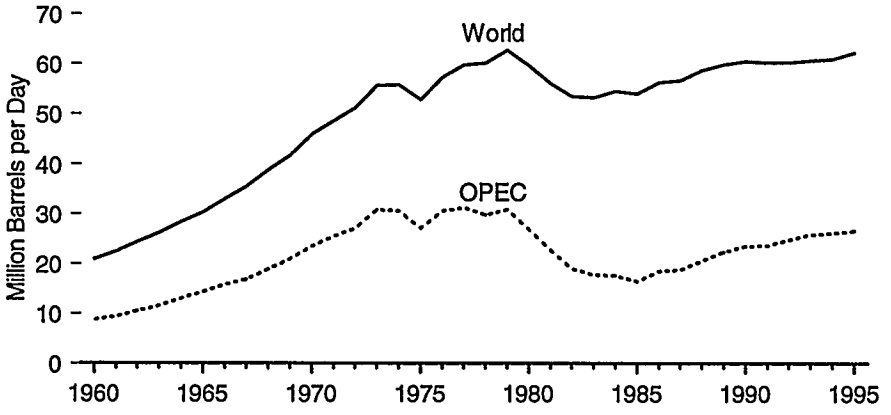
| Region and Country | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **North America** | **3,506** | **2,620** | **2,883** | **2,487** | **1,305** | **1,260** | **1,287** | **1,102** | **1,238** | **1,090** | **897** | **974** | **1,064** |
| Canada | 199 | 201 | 259 | 311 | 178 | 181 | 196 | 130 | 138 | 121 | 96 | R184 | 261 |
| Mexico | 202 | 187 | 196 | 196 | 163 | 143 | 155 | 103 | 90 | 109 | 80 | 36 | 28 |
| United States | 3,105 | 2,232 | 2,428 | 1,980 | 964 | 936 | 936 | 869 | 1,010 | 860 | 721 | 754 | 775 |
| **Central and South America** | **320** | **264** | **243** | **247** | **208** | **195** | **180** | **158** | **158** | **167** | **170** | **167** | **206** |
| Argentina | 67 | 73 | 82 | 81 | 47 | 61 | 63 | 55 | 64 | 60 | 49 | 42 | 71 |
| Bolivia | 11 | 8 | 6 | 5 | 4 | 6 | 5 | 6 | 6 | 10 | 16 | 11 | 10 |
| Brazil | 94 | 83 | 70 | 76 | 77 | 60 | 39 | 28 | 23 | 21 | 26 | 25 | 23 |
| Colombia | 23 | 18 | 16 | 21 | 17 | 14 | 19 | 15 | 11 | 9 | 12 | 13 | 15 |
| Venezuela | 69 | 41 | 30 | 33 | 29 | 18 | 25 | 28 | 32 | 45 | 50 | 58 | 69 |
| Other | R56 | R41 | R39 | R31 | R34 | R36 | R29 | R26 | R22 | R22 | R17 | R18 | 18 |
| **Western Europe** | **271** | **211** | **227** | **258** | **211** | **181** | **190** | **167** | **162** | **142** | **112** | R89 | **83** |
| Italy | 38 | 26 | 26 | 40 | 33 | 26 | 24 | 22 | 21 | 25 | 23 | 14 | 11 |
| Norway | 13 | 10 | 10 | 13 | 12 | 12 | 15 | 12 | 12 | 16 | 15 | 13 | 14 |
| Turkey | 34 | 26 | 24 | 25 | 27 | 26 | 21 | 20 | 17 | 19 | 15 | 16 | 16 |
| United Kingdom | 58 | 42 | 60 | 63 | 43 | 44 | 57 | 46 | 48 | 39 | 33 | 24 | 23 |
| Other | R128 | R107 | R107 | R117 | R96 | R73 | R73 | R67 | R64 | R43 | R26 | R22 | 19 |
| **Eastern Europe and Former U.S.S.R.** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **26** | **21** | **24** | **24** |
| Poland | NA | NA | NA | NA | NA | NA | NA | NA | NA | 22 | 18 | 18 | 18 |
| Russia | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | R4 | R3 | R6 | 6 |
| **Middle East** | **130** | **142** | **136** | **139** | **118** | **90** | **102** | **110** | **108** | **92** | **128** | R135 | **102** |
| Iran | 3 | 13 | 20 | 20 | 18 | 18 | 18 | 20 | 19 | 21 | 39 | 45 | 21 |
| Iraq | 11 | 23 | 19 | 28 | 21 | 10 | 23 | 26 | 123 | NA | NA | NA | NA |
| Oman | 12 | 11 | 12 | 13 | 13 | 10 | 9 | 13 | 17 | 14 | 12 | 16 | 16 |
| Saudi Arabia | 29 | 26 | 16 | 11 | 6 | 5 | 4 | 5 | 10 | 16 | 22 | 21 | 17 |
| Syria | 15 | 15 | 23 | 26 | 27 | 22 | 24 | 24 | 17 | 14 | 17 | 15 | 12 |
| United Arab Emirates | 50 | 45 | 36 | 26 | 18 | 11 | 10 | 9 | 12 | 16 | 18 | 18 | 17 |
| Other | R10 | R9 | R10 | R15 | R15 | R14 | R14 | R13 | R10 | R11 | R20 | R20 | 19 |
| **Africa** | **242** | **181** | **140** | **155** | **130** | **113** | **112** | **101** | **107** | **106** | **94** | **83** | **78** |
| Algeria | 81 | 54 | 27 | 35 | 41 | 40 | 32 | 24 | 35 | 31 | 30 | 29 | 28 |
| Egypt | 36 | 35 | 36 | 37 | 33 | 23 | 21 | 18 | 15 | 17 | 16 | 13 | 14 |
| Libya | 31 | 24 | 26 | 30 | 20 | 12 | 16 | 17 | 15 | 15 | 15 | 15 | 13 |
| Nigeria | 27 | 17 | 11 | 10 | 10 | 11 | 13 | 14 | 18 | 21 | 16 | 10 | 7 |
| Other | 67 | 51 | 40 | 43 | 26 | 27 | 30 | 28 | 24 | 22 | 17 | 16 | 16 |
| **Far East and Oceania** | **311** | **303** | **295** | **298** | **254** | **259** | **287** | **286** | **284** | **273** | **254** | R240 | **214** |
| Australia | 33 | 25 | 34 | 31 | 15 | 16 | 19 | 14 | 14 | 12 | 10 | 11 | 12 |
| Burma | 32 | 36 | 33 | 33 | 33 | 29 | 26 | 23 | 19 | 22 | 18 | R15 | 10 |
| India | 50 | 56 | 57 | 62 | 70 | 116 | 131 | 135 | 137 | 136 | 124 | R105 | 82 |
| Indonesia | 92 | 88 | 82 | 80 | 62 | 37 | 44 | 46 | 52 | 53 | 50 | R40 | 38 |
| Malaysia | 13 | 10 | 9 | 8 | 8 | 8 | 9 | 12 | 13 | 13 | 10 | 10 | 10 |
| Pakistan | 17 | 17 | 17 | 18 | 17 | 14 | 13 | 13 | 11 | 10 | 11 | 9 | 10 |
| Philippines | 14 | 8 | 3 | 2 | 1 | 2 | 4 | 7 | 6 | 5 | 7 | 9 | 10 |
| Other | R60 | R63 | R60 | R64 | R48 | R37 | R41 | R36 | R32 | R22 | R24 | R41 | 42 |
| **World** | **4,780** | **3,721** | **3,924** | **3,584** | **2,226** | **2,098** | **2,158** | **1,924** | **2,057** | **1,896** | **1,676** | R1,712 | **1,771** |

[1] Average rigs January through August.
R=Revised data. NA=Not available.

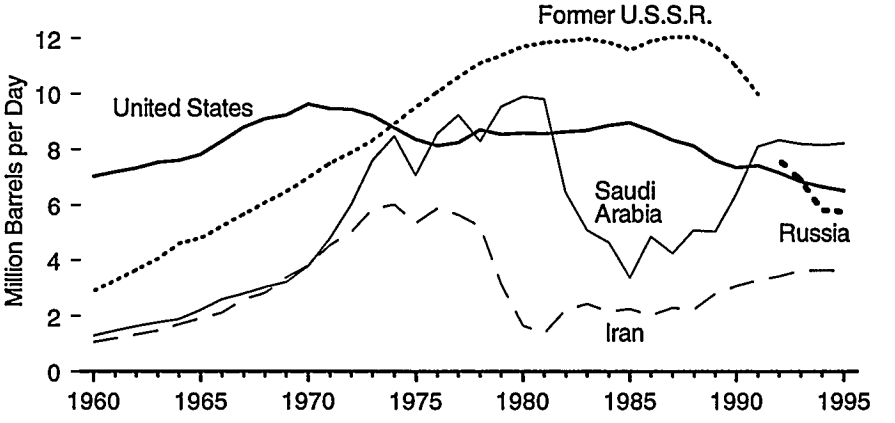
Source: Baker Hughes, Inc., Houston, Texas.

# Figure 11.5 World Crude Oil Production

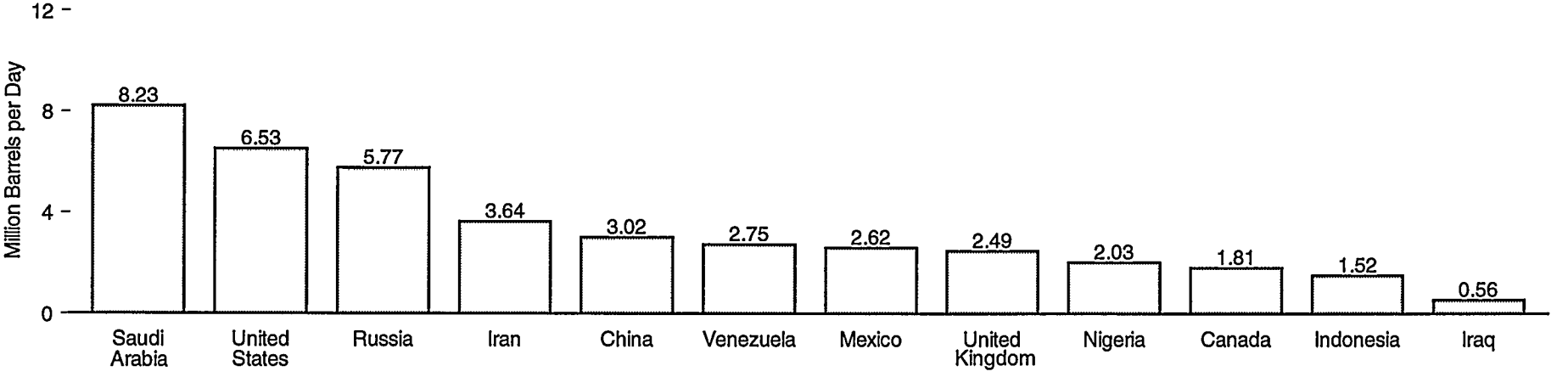
**World and OPEC, 1960-1995**




**Leading Producers, 1960-1995**




**Selected Producing Countries, 1995**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.5.

# Table 11.5 World Crude Oil Production, 1960-1995

(Million Barrels per Day)

| | OPEC [1] | | | | | | | | Non-OPEC | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Indonesia | Iran | Iraq | Nigeria | Saudi Arabia [2] | Venezuela | Other | Total | Canada | China | Mexico | Russia | United Kingdom | United States | Former U.S.S.R. | Other[3] | World |
| 1960 | 0.41 | 1.07 | 0.97 | 0.02 | 1.31 | 2.85 | 2.06 | 8.69 | 0.52 | 0.10 | 0.27 | — | (s) | 7.04 | 2.91 | 1.43 | 20.96 |
| 1961 | 0.42 | 1.20 | 1.01 | 0.05 | 1.48 | 2.92 | 2.28 | 9.36 | 0.61 | 0.11 | 0.29 | — | (s) | 7.18 | 3.28 | 1.60 | 22.43 |
| 1962 | 0.45 | 1.34 | 1.01 | 0.07 | 1.64 | 3.20 | 2.79 | 10.50 | 0.67 | 0.12 | 0.31 | — | (s) | 7.33 | 3.67 | 1.72 | 24.32 |
| 1963 | 0.44 | 1.49 | 1.16 | 0.08 | 1.79 | 3.25 | 3.30 | 11.51 | 0.71 | 0.13 | 0.32 | — | (s) | 7.54 | 4.07 | 1.85 | 26.13 |
| 1964 | 0.46 | 1.71 | 1.26 | 0.12 | 1.90 | 3.39 | 4.14 | 12.98 | 0.75 | 0.18 | 0.32 | — | (s) | 7.61 | 4.60 | 1.92 | 28.36 |
| 1965 | 0.48 | 1.91 | 1.31 | 0.27 | 2.21 | 3.47 | 4.68 | 14.33 | 0.81 | 0.23 | 0.32 | — | (s) | 7.80 | 4.79 | 2.02 | 30.30 |
| 1966 | 0.47 | 2.13 | 1.39 | 0.42 | 2.60 | 3.37 | 5.38 | 15.76 | 0.88 | 0.29 | 0.33 | — | (s) | 8.30 | 5.23 | 2.14 | 32.93 |
| 1967 | 0.51 | 2.60 | 1.23 | 0.32 | 2.81 | 3.54 | 5.84 | 16.84 | 0.96 | 0.28 | 0.37 | — | (s) | 8.81 | 5.68 | 2.43 | 35.37 |
| 1968 | 0.60 | 2.84 | 1.50 | 0.14 | 3.04 | 3.61 | 7.05 | 18.78 | 1.19 | 0.30 | 0.39 | — | (s) | 9.10 | 6.08 | 2.80 | 38.64 |
| 1969 | 0.74 | 3.38 | 1.52 | 0.54 | 3.22 | 3.59 | 7.91 | 20.90 | 1.13 | 0.48 | 0.46 | — | (s) | 9.24 | 6.48 | 3.00 | 41.69 |
| 1970 | 0.85 | 3.83 | 1.55 | 1.08 | 3.80 | 3.71 | 8.59 | 23.41 | 1.26 | 0.60 | 0.49 | — | (s) | 9.64 | 6.99 | 3.50 | 45.89 |
| 1971 | 0.89 | 4.54 | 1.69 | 1.53 | 4.77 | 3.55 | 8.35 | 25.32 | 1.35 | 0.78 | 0.49 | — | (s) | 9.46 | 7.48 | 3.64 | 48.52 |
| 1972 | 1.08 | 5.02 | 1.47 | 1.82 | 6.02 | 3.22 | 8.39 | 27.02 | 1.53 | 0.90 | 0.51 | — | (s) | 9.44 | 7.89 | 3.85 | 51.14 |
| 1973 | 1.34 | 5.86 | 2.02 | 2.05 | 7.60 | 3.37 | 8.55 | 30.78 | 1.80 | 1.09 | 0.47 | — | (s) | 9.21 | 8.32 | 4.01 | 55.68 |
| 1974 | 1.38 | 6.02 | 1.97 | 2.26 | 8.48 | 2.98 | 7.47 | 30.55 | 1.55 | 1.32 | 0.57 | — | (s) | 8.77 | 8.91 | 4.04 | 55.72 |
| 1975 | 1.31 | 5.35 | 2.26 | 1.78 | 7.08 | 2.35 | 6.87 | 26.99 | 1.43 | 1.49 | 0.71 | — | 0.01 | 8.37 | 9.52 | 4.30 | 52.83 |
| 1976 | 1.50 | 5.88 | 2.42 | 2.07 | 8.58 | 2.29 | 7.81 | 30.55 | 1.31 | 1.67 | 0.83 | — | 0.25 | 8.13 | 10.06 | 4.54 | 57.34 |
| 1977 | 1.69 | 5.66 | 2.35 | 2.09 | 9.25 | 2.24 | 7.85 | 31.12 | 1.32 | 1.87 | 0.98 | — | 0.77 | 8.24 | 10.60 | 4.80 | 59.71 |
| 1978 | 1.64 | 5.24 | 2.56 | 1.90 | 8.30 | 2.17 | 7.87 | 29.67 | 1.32 | 2.08 | 1.21 | — | 1.08 | 8.71 | 11.11 | 4.98 | 60.16 |
| 1979 | 1.59 | 3.17 | 3.48 | 2.30 | 9.53 | 2.36 | 8.36 | 30.78 | 1.50 | 2.12 | 1.46 | — | 1.57 | 8.55 | 11.38 | 5.30 | 62.67 |
| 1980 | 1.58 | 1.66 | 2.51 | 2.06 | 9.90 | 2.17 | 6.91 | 26.78 | 1.44 | 2.11 | 1.94 | — | 1.62 | 8.60 | 11.71 | 5.41 | 59.60 |
| 1981 | 1.61 | 1.38 | 1.00 | 1.43 | 9.82 | 2.10 | 5.30 | 22.63 | 1.29 | 2.01 | 2.31 | — | 1.81 | 8.57 | 11.85 | 5.60 | 56.08 |
| 1982 | 1.34 | 2.21 | 1.01 | 1.30 | 6.48 | 1.90 | 4.70 | 18.93 | 1.27 | 2.05 | 2.75 | — | 2.07 | 8.65 | 11.91 | 5.86 | 53.48 |
| 1983 | 1.34 | 2.44 | 1.01 | 1.24 | 5.09 | 1.80 | 4.74 | 17.65 | 1.36 | 2.12 | 2.69 | — | 2.29 | 8.69 | 11.97 | 6.49 | 53.26 |
| 1984 | 1.41 | 2.17 | 1.21 | 1.39 | 4.66 | 1.80 | 4.96 | 17.60 | 1.44 | 2.30 | 2.78 | — | 2.48 | 8.88 | 11.86 | 7.16 | 54.49 |
| 1985 | 1.33 | 2.25 | 1.43 | 1.50 | 3.39 | 1.68 | 4.79 | 16.35 | 1.47 | 2.51 | 2.75 | — | 2.53 | 8.97 | 11.59 | 7.82 | 53.98 |
| 1986 | 1.39 | 2.04 | 1.69 | 1.47 | 4.87 | 1.79 | 5.20 | 18.44 | 1.47 | 2.62 | 2.44 | — | 2.54 | 8.68 | 11.90 | 8.14 | 56.23 |
| 1987 | 1.34 | 2.30 | 2.08 | 1.34 | 4.27 | 1.75 | 5.59 | 18.67 | 1.54 | 2.69 | 2.55 | — | 2.41 | 8.35 | R12.05 | 8.42 | R56.67 |
| 1988 | 1.34 | 2.24 | 2.69 | 1.45 | 5.09 | 1.90 | 5.78 | 20.48 | 1.62 | 2.73 | 2.51 | — | 2.23 | 8.14 | R12.05 | 8.97 | R58.74 |
| 1989 | 1.41 | 2.81 | 2.90 | 1.72 | 5.06 | 1.91 | 6.48 | 22.28 | 1.56 | 2.76 | 2.52 | — | 1.80 | 7.61 | R11.72 | 9.62 | R59.86 |
| 1990 | 1.46 | 3.09 | 2.04 | 1.81 | 6.41 | 2.14 | 6.52 | 23.47 | 1.55 | 2.77 | 2.55 | — | 1.82 | 7.36 | R10.98 | 10.07 | R60.57 |
| 1991 | 1.59 | 3.31 | 0.31 | 1.89 | 8.12 | 2.38 | 5.98 | 23.57 | 1.55 | 2.84 | 2.68 | — | 1.80 | 7.42 | R9.99 | 10.37 | R60.21 |
| 1992 | R1.50 | 3.43 | R0.43 | R1.94 | R8.33 | R2.37 | R6.69 | R24.70 | R1.61 | R2.85 | 2.67 | R7.63 | 1.83 | 7.17 | — | R11.77 | R60.21 |
| 1993 | R1.53 | 3.65 | 0.51 | 2.05 | 8.20 | R2.45 | R7.36 | R25.75 | 1.68 | 2.91 | 2.67 | R6.89 | R1.92 | 6.85 | — | R11.98 | R60.64 |
| 1994 | 1.51 | R3.64 | 0.55 | R2.04 | 8.15 | 2.51 | R7.62 | R26.02 | R1.74 | 2.94 | 2.69 | R5.82 | 2.37 | R6.66 | — | R12.67 | R60.92 |
| 1995P | 1.52 | 3.64 | 0.56 | 2.03 | 8.23 | 2.75 | 7.75 | 26.48 | 1.81 | 3.02 | 2.62 | 5.77 | 2.49 | 6.53 | — | 13.51 | 62.23 |

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.

[2] Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.

[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included in "Non-OPEC" for all years shown in this table.

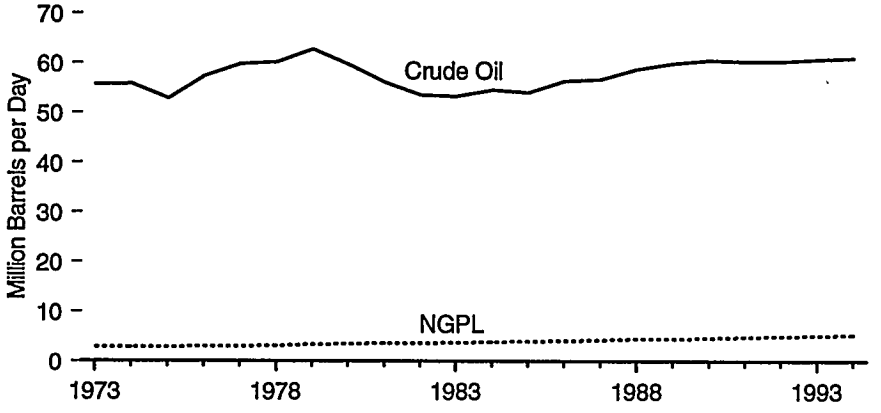
R=Revised data. P=Preliminary data. — = Not applicable. (s)=Less than 5,000 barrels per day.

Notes: • Includes lease condensate, excludes natural gas plant liquids. • Totals may not equal sum of components due to independent rounding.

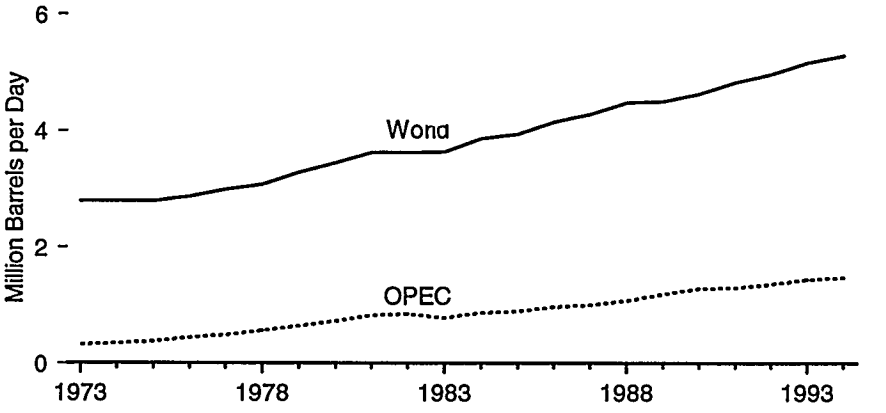
Sources: **China:** • 1960-1972—Central Intelligence Agency, unpublished data. • 1973-1979—Energy Information Administration (EIA), *International Energy Annual 1983*, Table 8. • 1980-1994—EIA, Office of Energy Markets and End Use, International Database, March 1996. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 10.1. **United States:** • 1960-1975—Bureau of Mines, Mineral Industry Surveys, *Petroleum Statement, Annual.* • 1976-1980—EIA, Energy Data Reports, *Petroleum Statement, Annual.* • 1981-1994—EIA, *Petroleum Supply Annual.* • 1995—EIA, *Monthly Energy Review* (March 1996), Table 10.1. **Former U.S.S.R.:** • 1960-1969—U.S.S.R. Central Statistical Office, *Narodnoye Khozyaystvo SSSR* (National Economy USSR). • 1970-1991—EIA, *International Petroleum Statistics Report*, February 1996, Table 4.1c. **Russia:** • 1992 forward—EIA, Office of Energy Markets and End Use, International Database, March 1996. **OPEC Nations:** • 1960-1972—Organization of Petroleum Exporting Countries, *Annual Statistical Bulletin 1979.* • 1973-1979—EIA, *International Energy Annual 1983*, Table 8. • 1980-1994—EIA, Office of Energy Markets and End Use, International Database, March 1996. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 10.1. **All Other Countries:** • 1960-1969—Bureau of Mines, *International Petroleum Annual, 1969.* • 1970-1972—EIA, *International Petroleum Annual, 1978.* • 1973-1979—EIA, *International Energy Annual 1983*, Table 8. • 1980-1994—EIA, Office of Energy Markets and End Use, International Database, March 1996. • 1995—EIA, *Monthly Energy Review* (March 1996), Table 10.1.

# Figure 11.6 World Natural Gas Plant Liquids Production

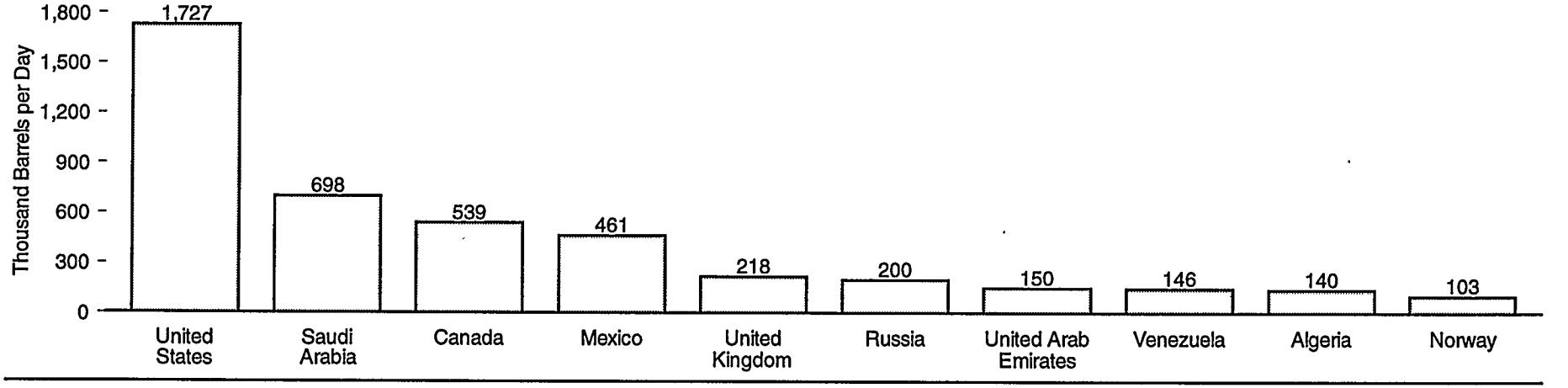
**Crude Oil and NGPL Production, 1973-1994**




**World and OPEC NGPL Production, 1973-1994**




**Top NGPL Producing Countries, 1994**




Note: Because vertical scales differ, graphs should not be compared.

Sources: Tables 11.5 and 11.6.

# Table 11.6 World Natural Gas Plant Liquids Production, 1973-1994

(Thousand Barrels per Day)

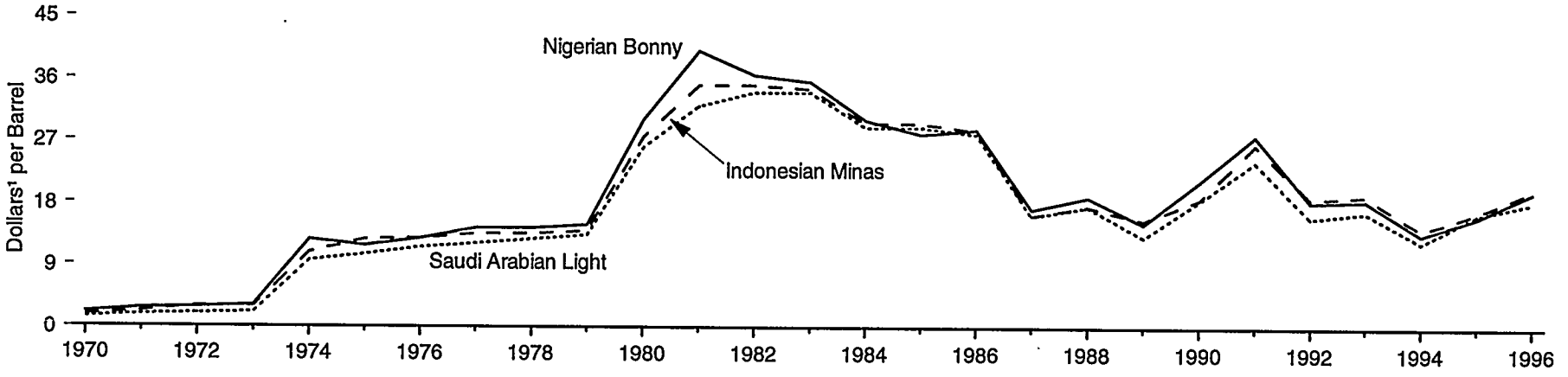
| | OPEC[1] | | | | | | | | Non-OPEC | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Algeria | Indonesia | Kuwait[2] | Saudi Arabia[2] | United Arab Emirates | Venezuela | Other | Total | Canada | Kazakstan | Mexico | Norway | Russia | United Kingdom | United States | Former U.S.S.R. | Other[3] | World |
| 1973 | 9 | (s) | 60 | 90 | (s) | 89 | 76 | 324 | 314 | — | 75 | (s) | — | 5 | 1,738 | 170 | 160 | 2,786 |
| 1974 | 12 | (s) | 50 | 130 | (s) | 84 | 71 | 347 | 314 | — | 80 | (s) | — | 5 | 1,688 | 190 | 166 | 2,790 |
| 1975 | 20 | (s) | 50 | 140 | (s) | 76 | 86 | 372 | 309 | — | 80 | 5 | — | 15 | 1,633 | 205 | R172 | 2,791 |
| 1976 | 24 | 10 | 50 | 185 | (s) | 77 | R96 | 442 | 289 | — | 95 | 20 | — | 15 | 1,604 | 220 | R182 | 2,867 |
| 1977 | 19 | 10 | 55 | 215 | 15 | 78 | R90 | 482 | 290 | — | 105 | 20 | — | 30 | 1,618 | 235 | R204 | 2,984 |
| 1978 | 25 | 30 | 75 | 250 | 30 | 61 | R95 | 566 | 281 | — | 115 | 35 | — | 40 | 1,567 | 255 | R221 | 3,080 |
| 1979 | 30 | 40 | 95 | 303 | 30 | 69 | R70 | 637 | 331 | — | 150 | 40 | — | 45 | 1,584 | 270 | R230 | 3,287 |
| 1980 | 36 | 70 | 95 | 369 | 35 | 60 | R67 | 732 | 331 | — | 193 | 40 | — | 45 | 1,573 | 285 | R245 | 3,444 |
| 1981 | 49 | 95 | 60 | 433 | 60 | 55 | R73 | 825 | 330 | — | 241 | 31 | — | 50 | 1,609 | 300 | R239 | 3,625 |
| 1982 | 58 | 80 | 40 | 430 | 90 | 60 | R84 | 842 | 318 | — | 255 | 33 | — | 78 | 1,550 | 315 | R235 | 3,626 |
| 1983 | 56 | 94 | 55 | 330 | 120 | 57 | R68 | 780 | 309 | — | 265 | 38 | — | 111 | 1,559 | 330 | R243 | 3,635 |
| 1984 | 105 | 75 | 67 | 355 | 130 | 57 | R80 | 869 | 336 | — | 257 | 36 | — | 136 | 1,630 | 340 | R265 | 3,869 |
| 1985 | 120 | 44 | 54 | 375 | 160 | 63 | R76 | 892 | 337 | — | 271 | 41 | — | 145 | 1,609 | 350 | R293 | 3,938 |
| 1986 | 120 | 30 | 75 | 385 | 185 | 97 | R77 | 969 | 328 | — | 352 | 53 | — | 152 | 1,551 | 440 | R305 | 4,150 |
| 1987 | 140 | 30 | 95 | 418 | 145 | 94 | R84 | 1,006 | 367 | — | 338 | 55 | — | 162 | 1,595 | 430 | R325 | 4,279 |
| 1988 | 120 | 30 | 100 | 499 | 130 | 98 | R100 | 1,077 | 381 | — | 370 | 75 | — | 159 | 1,625 | 450 | R343 | 4,481 |
| 1989 | 130 | 72 | 105 | 503 | 130 | 108 | R140 | 1,188 | 410 | — | 384 | 74 | — | 140 | 1,546 | 425 | R335 | R4,502 |
| 1990 | 130 | 77 | 65 | 620 | 135 | 114 | R140 | 1,281 | 426 | — | 428 | 78 | — | 108 | 1,559 | 425 | R327 | R4,632 |
| 1991 | 140 | 76 | 0 | 680 | R146 | 117 | R140 | R1,299 | 431 | — | 457 | 94 | — | 141 | 1,659 | 420 | R326 | R4,827 |
| 1992 | 140 | 75 | 34 | 713 | 144 | 113 | R145 | 1,364 | 460 | 86 | 454 | 95 | 230 | 160 | 1,697 | — | R427 | R4,973 |
| 1993 | 145 | 78 | 53 | 704 | R146 | R143 | R166 | R1,435 | R506 | 82 | R459 | 100 | 220 | 169 | 1,736 | — | R463 | R5,169 |
| 1994P | 140 | 80 | 90 | 698 | 150 | 146 | 171 | 1,475 | 539 | 63 | 461 | 103 | 200 | 218 | 1,727 | — | 511 | 5,297 |

[1] Organization of Petroleum Exporting Countries. See Glossary for membership.
[2] Includes about one-half of the production in the Neutral Zone between Kuwait and Saudi Arabia.
[3] Ecuador, which withdrew from OPEC on December 31, 1992, is included in "Non-OPEC" for all years shown in this table.

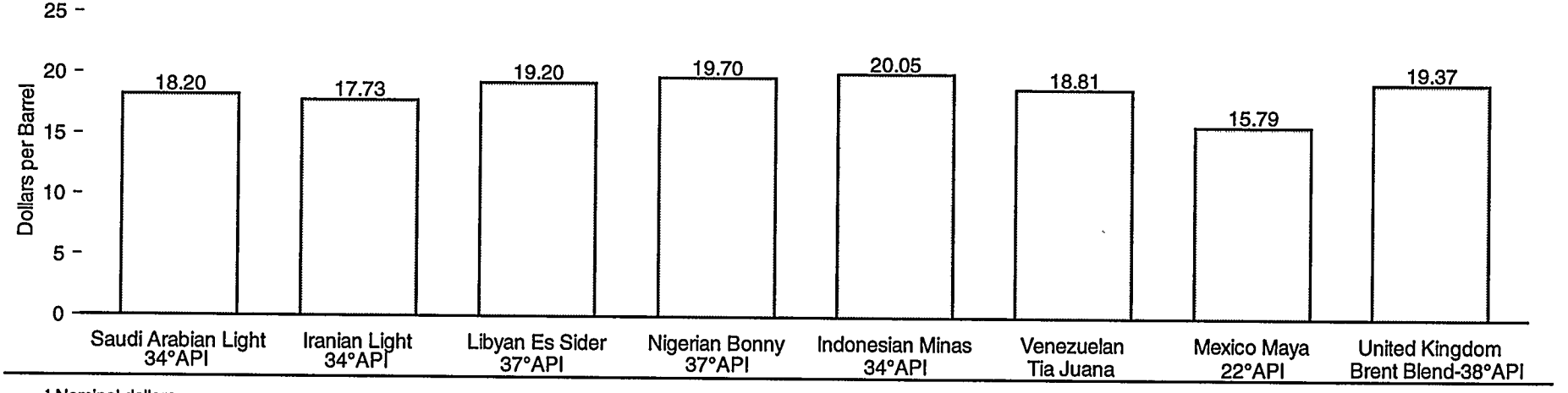
R=Revised data. P=Preliminary data. — = Not applicable. (s)=Less than 500 barrels per day.
Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.7 World Crude Oil Prices by Selected Type

**Selected Types, 1970-1996**




**Selected Types, 1996**




[1] Nominal dollars.

Notes: • Prices are as of the first Friday in January, except in 1987, when prices are as of the first Friday in February. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.7.

# Table 11.7 World Crude Oil Prices by Selected Type, 1970-1996

(Dollars[1] per Barrel)

| Year | Saudi Arabian Light-34° API | Iranian Light-34° API | Libyan [2] Es Sider-37° API | Nigerian [3] Bonny-37° API | Indonesian Minas-34° API | Venezuelan Tia Juana [4] | Mexico Maya-22° API | United Kingdom Brent Blend-38° API |
|---|---|---|---|---|---|---|---|---|
| 1970 | 1.35 | 1.36 | 2.09 | 2.10 | 1.67 | 2.05 | NA | NA |
| 1971 | 1.75 | 1.76 | 2.80 | 2.65 | 2.18 | 2.45 | NA | NA |
| 1972 | 1.90 | 1.91 | 2.80 | 2.80 | 2.96 | 2.45 | NA | NA |
| 1973 | 2.10 | 2.11 | 3.10 | 3.10 | 2.96 | 2.60 | NA | NA |
| 1974 | 9.60 | 10.63 | 14.30 | 12.60 | 10.80 | 9.30 | NA | NA |
| 1975 | 10.46 | 10.67 | 11.98 | 11.80 | 12.60 | 11.00 | NA | NA |
| 1976 | 11.51 | 11.62 | 12.21 | 12.84 | 12.80 | 11.12 | NA | NA |
| 1977 | 12.09 | 12.81 | 13.74 | 14.33 | 13.55 | 12.72 | NA | NA |
| 1978 | 12.70 | 12.81 | 13.80 | 14.33 | 13.55 | 12.82 | NA | NA |
| 1979 | 13.34 | 13.45 | 14.52 | 14.80 | 13.90 | 13.36 | 15.45 | 15.70 |
| 1980 | 26.00 | [5]30.37 | 34.50 | 29.97 | 27.50 | 25.20 | 28.00 | 26.02 |
| 1981 | 32.00 | 37.00 | 40.78 | 40.00 | 35.00 | 32.88 | 34.50 | 39.25 |
| 1982 | 34.00 | 34.20 | 36.50 | 36.50 | 35.00 | 32.88 | 26.50 | 36.60 |
| 1983 | 34.00 | 31.20 | 35.10 | 35.50 | 34.53 | 32.88 | 25.50 | 33.50 |
| 1984 | 29.00 | 28.00 | 30.15 | 30.00 | 29.53 | 27.88 | 25.00 | 30.00 |
| 1985 | 29.00 | 28.00 | 30.15 | 28.00 | 29.53 | 27.88 | 25.50 | 28.65 |
| 1986 | 28.00 | 28.05 | 30.15 | 28.65 | 28.53 | 27.10 | 21.93 | 26.00 |
| 1987 | 16.15 | 16.14 | 16.95 | 17.13 | 16.28 | 15.10 | 14.00 | 18.25 |
| 1988 | 17.52 | 15.55 | 18.52 | 18.92 | 17.56 | 17.62 | 11.10 | 18.00 |
| 1989 | 13.15 | 12.75 | 15.40 | 15.05 | 15.50 | 12.27 | 10.63 | 15.80 |
| 1990 | 18.40 | 18.20 | 20.40 | 21.20 | 18.55 | 24.69 | 17.05 | 21.00 |
| 1991 | 24.00 | 23.65 | 26.90 | 27.80 | 26.50 | 28.62 | 20.00 | 27.20 |
| 1992 | 15.90 | 15.50 | 17.20 | 18.20 | 18.65 | 19.67 | 10.75 | 17.75 |
| 1993 | 16.80 | 16.70 | 17.55 | 18.50 | 19.10 | 17.97 | 12.50 | 17.90 |
| 1994 | 12.40 | 12.40 | 12.55 | 13.50 | 14.15 | 12.97 | 9.01 | 13.15 |
| 1995 | 16.48 | 16.03 | 16.00 | 16.10 | 16.70 | 17.10 | 13.36 | 16.20 |
| 1996 | 18.20 | 17.73 | 19.20 | 19.70 | 20.05 | 18.81 | 15.79 | 19.37 |

[1] Nominal dollars.
[2] Prices for 1974 and 1975 are for crude oil with 40 degrees API gravity. Prices for 1980 include $4.72 in retroactive charges and market premiums.
[3] Prices from 1977 forward include 2 cents per barrel harbor dues.
[4] 1970-1985—26° API; 1986 forward—31° API.
[5] Price for 1980 includes $1.87 market premiums and credit charges.

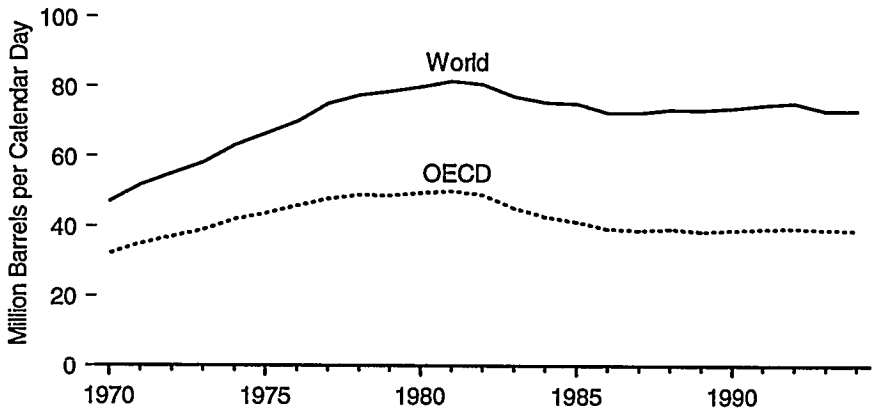
NA=Not available.

Notes: • Prices are usually f.o.b. at the foreign port of lading. • Prices are as of the first Friday in January, except in 1987, when prices are as of the first Friday in February.

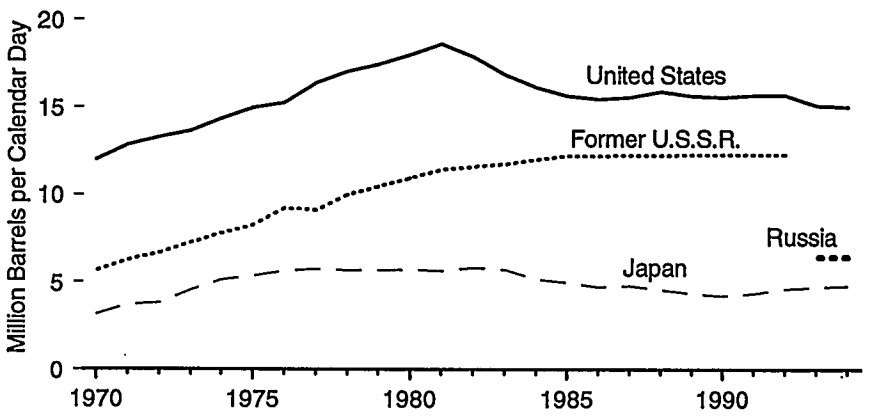
Sources: • 1970-1978—Petroleum and Energy Intelligence Weekly, Inc., *Petroleum Intelligence Weekly*. • 1979 forward—Energy Information Administration, *Weekly Petroleum Status Report*.

# Figure 11.8 World Crude Oil Refining Capacity

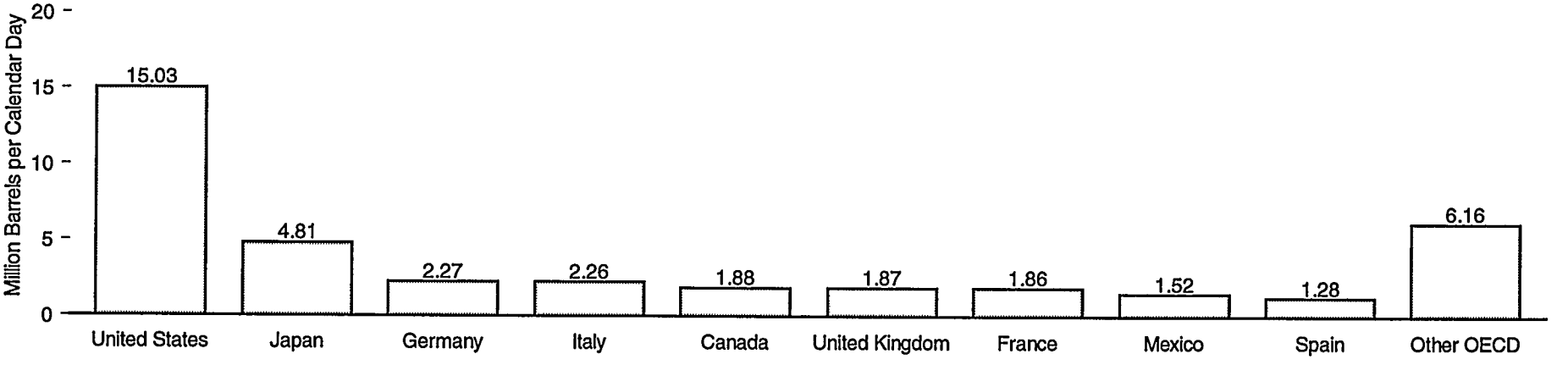
**World and OECD, 1970-1994**




**Capacity in Leading Countries, 1970-1994**




**OECD Crude Oil Refining Capacity by Country, 1994**




Notes: • Capacity is as of January 1. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.8.

# Table 11.8 World Crude Oil Refining Capacity, 1970-1994

(Million Barrels per Calendar Day)

| | OECD [1] | | | | | | | | | | | Non-OECD | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Canada | France | Germany[2] | Italy | Japan | Mexico[3] | Spain | United Kingdom | United States | Other | Total | Brazil | China | Russia | Saudi Arabia | Ukraine | Former U.S.S.R. | Other | World |
| 1970 | 1.40 | 2.32 | 2.36 | 2.96 | 3.14 | 0.50 | 0.69 | 2.30 | 12.02 | R4.32 | R32.00 | 0.50 | 0.30 | — | 0.38 | — | 5.64 | R8.27 | 47.10 |
| 1971 | 1.45 | 2.53 | 2.54 | 3.24 | 3.70 | 0.57 | 0.85 | 2.39 | 12.86 | R4.79 | R34.93 | 0.51 | 0.42 | — | 0.91 | — | 6.27 | R8.88 | 51.91 |
| 1972 | 1.45 | 2.69 | 2.56 | 3.68 | 3.82 | 0.59 | 0.87 | 2.59 | 13.29 | R5.46 | R37.00 | 0.56 | 0.48 | — | 0.51 | — | 6.68 | R9.90 | R55.14 |
| 1973 | 1.73 | 2.95 | 2.70 | 3.59 | 4.53 | 0.63 | 1.03 | 2.47 | 13.64 | R5.80 | R39.05 | 0.72 | 0.50 | — | 0.43 | — | 7.26 | R10.25 | 58.20 |
| 1974 | 1.79 | 3.14 | 2.83 | 3.88 | 5.15 | 0.63 | 1.16 | 2.76 | 14.36 | R6.29 | R41.99 | 0.79 | 0.60 | — | 0.43 | — | 7.81 | R11.53 | 63.15 |
| 1975 | 1.88 | 3.34 | 2.99 | 3.95 | 5.35 | 0.76 | 1.17 | 2.78 | 14.96 | R6.47 | R43.65 | 0.96 | 0.85 | — | 0.61 | — | 8.24 | R12.21 | 66.52 |
| 1976 | 2.02 | 3.31 | 3.10 | 4.08 | 5.63 | 0.76 | 1.32 | 2.89 | 15.24 | R7.37 | R45.73 | 0.99 | 1.01 | — | 0.54 | — | 9.23 | R12.44 | 69.93 |
| 1977 | 2.10 | 3.52 | 3.08 | 4.26 | 5.76 | 0.94 | 1.28 | 3.01 | 16.40 | R7.58 | R47.92 | 1.12 | 1.40 | — | 0.60 | — | 9.10 | R14.98 | R75.11 |
| 1978 | 2.17 | 3.46 | 3.08 | 4.23 | 5.67 | 1.38 | 1.27 | 2.91 | 17.05 | R7.68 | R48.89 | 1.16 | 1.46 | — | 0.59 | — | 9.98 | R15.38 | 77.46 |
| 1979 | 2.23 | 3.47 | 3.10 | 4.20 | 5.68 | 1.24 | 1.43 | 2.53 | 17.44 | R7.46 | R48.77 | 1.21 | 1.58 | — | 0.49 | — | 10.48 | R16.06 | 78.58 |
| 1980 | 2.22 | 3.40 | 2.99 | 4.13 | 5.71 | 1.39 | 1.46 | 2.53 | 17.99 | R7.66 | R49.47 | 1.21 | 1.60 | — | 0.49 | — | 10.95 | R16.14 | 79.85 |
| 1981 | 2.17 | 3.34 | 3.02 | 4.09 | 5.66 | 1.39 | 1.46 | 2.63 | 18.62 | R7.57 | R49.96 | 1.40 | 1.81 | — | 0.49 | — | 11.40 | R16.50 | 81.56 |
| 1982 | 2.20 | 3.29 | 2.94 | 4.00 | 5.81 | 1.47 | 1.52 | 2.48 | 17.89 | R7.35 | R48.95 | 1.41 | 1.81 | — | 0.49 | — | 11.60 | R16.38 | 80.63 |
| 1983 | 2.02 | 2.87 | 2.47 | 3.28 | 5.73 | 1.29 | 1.52 | 2.26 | 16.86 | R6.73 | R45.03 | 1.22 | 2.00 | — | 0.71 | — | 11.75 | R16.50 | 77.21 |
| 1984 | 1.81 | 2.67 | 2.39 | 3.05 | 5.17 | 1.27 | 1.49 | 2.09 | 16.14 | R6.56 | R42.64 | 1.30 | 2.05 | — | 0.86 | — | 12.00 | R16.57 | 75.42 |
| 1985 | 1.87 | 2.39 | 2.17 | 3.10 | 4.97 | 1.27 | 1.49 | 2.01 | 15.66 | R6.41 | R41.32 | 1.31 | 2.15 | — | 0.84 | — | 12.20 | R17.30 | 75.12 |
| 1986 | 1.86 | 1.95 | 1.93 | 2.74 | 4.72 | 1.27 | 1.37 | 1.79 | 15.46 | R6.14 | R39.22 | 1.31 | 2.15 | — | 1.12 | — | 12.20 | R16.57 | R72.55 |
| 1987 | 1.76 | 1.83 | 1.72 | 2.68 | 4.79 | 1.35 | 1.31 | 1.78 | 15.57 | R6.00 | R38.78 | 1.32 | 2.20 | — | 1.13 | — | 12.26 | R16.89 | 72.57 |
| 1988 | 1.87 | 1.94 | 1.65 | 2.56 | 4.57 | 1.35 | 1.31 | 1.80 | 15.92 | R6.24 | R39.21 | 1.41 | 2.20 | — | 1.38 | — | 12.26 | R17.12 | 73.57 |
| 1989 | 1.86 | 1.88 | 1.52 | 2.45 | 4.36 | 1.35 | 1.29 | 1.80 | 15.65 | R6.31 | R38.47 | 1.41 | 2.20 | — | 1.38 | — | 12.30 | R17.59 | 73.34 |
| 1990 | 1.85 | 1.82 | 1.51 | 2.60 | 4.20 | 1.51 | 1.29 | 1.83 | 15.57 | R6.40 | R38.79 | 1.40 | 2.20 | — | 1.48 | — | 12.30 | R17.69 | 73.86 |
| 1991 | 1.88 | 1.82 | 2.07 | 2.39 | 4.38 | 1.68 | 1.32 | 1.87 | 15.68 | R6.22 | R39.30 | 1.41 | 2.20 | — | 1.86 | — | 12.30 | R17.69 | 74.76 |
| 1992 | 1.91 | 1.82 | 2.06 | 2.39 | 4.61 | 1.57 | 1.32 | 1.86 | 15.70 | R6.23 | R39.46 | 1.41 | 2.20 | — | 1.86 | — | 12.30 | R18.12 | 75.34 |
| 1993 | 1.87 | 1.85 | 2.23 | 2.42 | 4.74 | 1.52 | 1.30 | 1.84 | 15.12 | R6.19 | R39.09 | 1.40 | 2.20 | 6.46 | 1.86 | 1.24 | — | R20.83 | 73.10 |
| 1994 | 1.88 | 1.86 | 2.27 | 2.26 | 4.81 | 1.52 | 1.28 | 1.87 | 15.03 | 6.16 | 38.94 | 1.25 | 2.20 | 6.46 | 1.61 | 1.24 | — | 21.35 | 73.06 |

[1] Organization for Economic Cooperation and Development. See Glossary for membership. "Other OECD" includes the United States territories of Puerto Rico, U.S. Virgin Islands, Guam, and Hawaiian Free Trade Zone. As of January 1, 1987, Hawaiian Free Trade Zone data are included in U.S. 50 States data.

[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

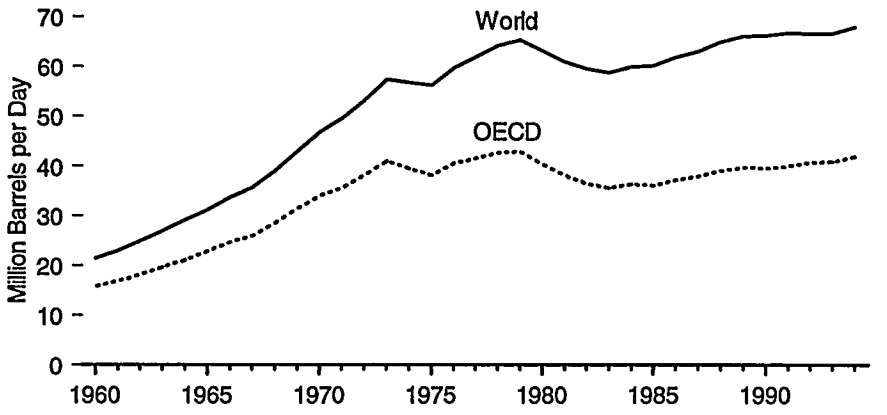
[3] Mexico, which joined the OECD on May 18, 1994, is included in the OECD for all years shown in this table.

Notes: • Capacity is as of January 1. • Totals may not equal sum of components due to independent rounding.

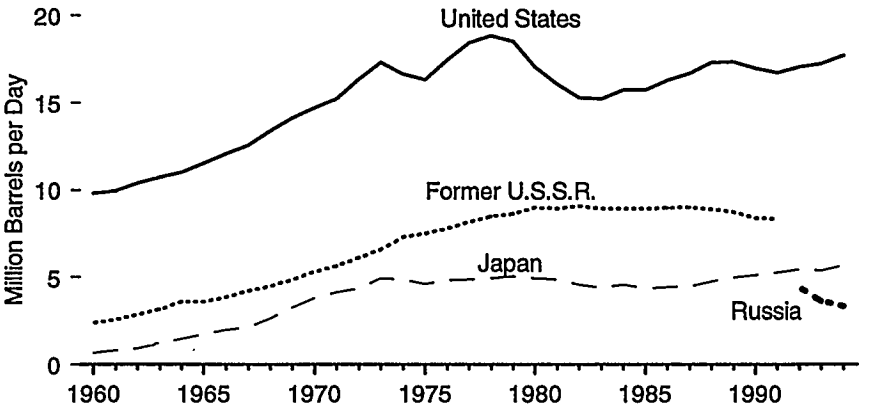
Sources: **United States:** • 1970-1977—Bureau of Mines, Mineral Industry Surveys, *Petroleum Refineries, Annual.* • 1978-1981—Energy Information Administration (EIA), Energy Data Reports, *Petroleum Refineries in the United States and U.S. Territories.* • 1982 forward—EIA, *Petroleum Supply Annual.* **China and U.S.S.R.:** • 1970-1976—Ballinger Publishing Company, *The Energy Decade, 1970-1980, A Statistical and Graphic Chronicle.* • 1977-forward—PennWell Publishing Company, *Oil and Gas Journal.* **All Other Countries:** PennWell Publishing Company, *Oil and Gas Journal.*

# Figure 11.9 World Petroleum Consumption

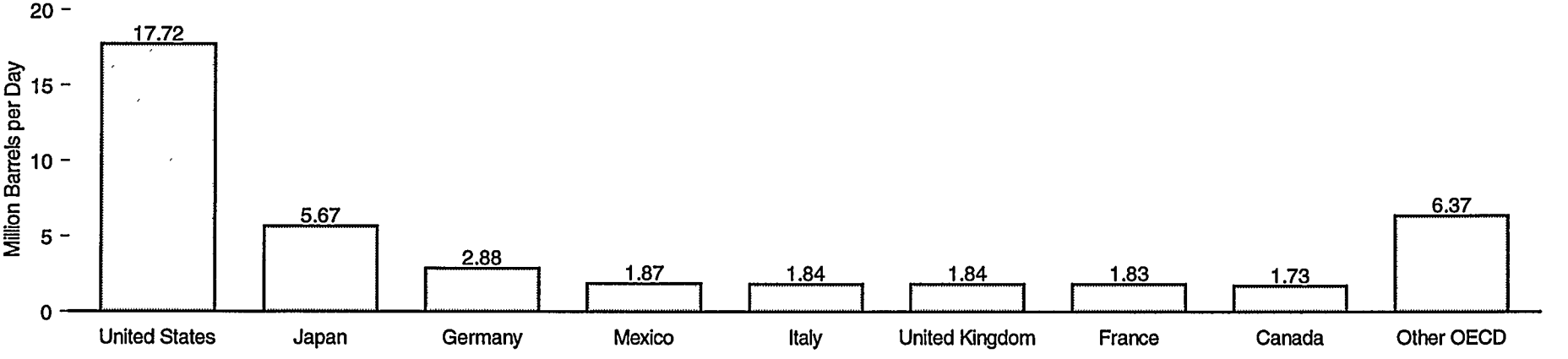
**World and OECD, 1960-1994**




**Leading Consumers, 1960-1994**




**OECD Consumers, 1994**




Notes: •OECD=Organization for Economic Cooperation and Development. See Glossary for membership. •Because vertical scales differ, graphs should not be compared.

Source: Table 11.9.

# Table 11.9 World Petroleum Consumption, 1960-1994

(Million Barrels per Day)

| | OECD [1] | | | | | | | | | | Non-OECD | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Canada | France | Germany[2] | Italy | Japan | Mexico[3] | United Kingdom | United States | Other | Total | Brazil | China | India | Russia | South Korea | Former U.S.S.R. | World |
| 1960 | 0.84 | 0.56 | 0.63 | 0.44 | 0.66 | 0.30 | 0.94 | 9.80 | R1.60 | R15.77 | 0.27 | 0.17 | 0.16 | — | 0.01 | 2.38 | 21.34 |
| 1961 | 0.87 | 0.63 | 0.79 | 0.54 | 0.82 | 0.29 | 1.04 | 9.98 | R1.80 | R16.75 | 0.28 | 0.17 | 0.17 | — | 0.02 | 2.57 | 23.00 |
| 1962 | 0.92 | 0.73 | 1.00 | 0.67 | 0.93 | 0.30 | 1.12 | 10.40 | R1.99 | R18.04 | 0.31 | 0.14 | 0.18 | — | 0.02 | 2.87 | 24.89 |
| 1963 | 0.99 | 0.86 | 1.17 | 0.77 | 1.21 | 0.31 | 1.27 | 10.74 | R2.26 | R19.57 | 0.34 | 0.17 | 0.21 | — | 0.03 | 3.15 | 26.92 |
| 1964 | 1.05 | 0.98 | 1.36 | 0.90 | 1.48 | 0.33 | 1.36 | 11.02 | R2.55 | R21.03 | 0.35 | 0.20 | 0.22 | — | 0.02 | 3.58 | 29.08 |
| 1965 | 1.14 | 1.09 | 1.61 | 0.98 | 1.74 | 0.34 | 1.49 | 11.51 | R2.88 | R22.78 | 0.33 | 0.23 | 0.25 | — | 0.03 | 3.61 | 31.14 |
| 1966 | 1.21 | 1.19 | 1.80 | 1.08 | 1.98 | 0.36 | 1.58 | 12.08 | R3.29 | R24.56 | 0.38 | 0.30 | 0.28 | — | 0.04 | 3.87 | 33.56 |
| 1967 | 1.25 | 1.34 | 1.86 | 1.19 | 2.14 | 0.39 | 1.64 | 12.56 | R3.49 | R25.87 | 0.38 | 0.28 | 0.26 | — | 0.07 | 4.22 | 35.59 |
| 1968 | 1.34 | 1.46 | 1.99 | 1.40 | 2.66 | 0.41 | 1.82 | 13.39 | R3.99 | R28.46 | 0.46 | 0.31 | 0.31 | — | 0.10 | 4.48 | 38.96 |
| 1969 | 1.42 | 1.66 | 2.33 | 1.69 | 3.25 | 0.45 | 1.98 | 14.14 | R4.47 | R31.39 | 0.48 | 0.44 | 0.34 | — | 0.15 | 4.87 | 42.89 |
| 1970 | 1.52 | 1.94 | 2.83 | 1.71 | 3.82 | 0.50 | 2.10 | 14.70 | R4.89 | R33.99 | 0.53 | 0.62 | 0.40 | — | 0.20 | 5.31 | 46.81 |
| 1971 | 1.56 | 2.12 | 2.94 | 1.84 | 4.14 | 0.52 | 2.14 | 15.21 | R5.04 | R35.51 | 0.58 | 0.79 | 0.42 | — | 0.23 | 5.66 | 49.42 |
| 1972 | 1.66 | 2.32 | 3.13 | 1.95 | 4.36 | 0.59 | 2.28 | 16.37 | R5.47 | R38.14 | 0.66 | 0.91 | 0.46 | — | 0.23 | 6.12 | 53.09 |
| 1973 | 1.73 | 2.60 | 3.34 | 2.07 | 4.95 | 0.67 | 2.34 | 17.31 | R5.85 | R40.85 | 0.78 | 1.12 | 0.49 | — | 0.28 | 6.60 | 57.24 |
| 1974 | 1.78 | 2.45 | 3.06 | 2.00 | 4.86 | 0.71 | 2.21 | 16.65 | R5.68 | R39.40 | 0.86 | 1.19 | 0.47 | — | 0.29 | 7.28 | 56.68 |
| 1975 | 1.78 | 2.25 | 2.96 | 1.86 | 4.62 | 0.75 | 1.91 | 16.32 | R5.59 | R38.04 | 0.92 | 1.36 | 0.50 | — | 0.31 | 7.52 | 56.20 |
| 1976 | 1.82 | 2.42 | 3.21 | 1.97 | 4.84 | 0.83 | 1.89 | 17.46 | R6.08 | R40.52 | 1.00 | 1.53 | 0.51 | — | 0.36 | 7.78 | 59.67 |
| 1977 | 1.85 | 2.29 | 3.21 | 1.90 | 4.88 | 0.88 | 1.91 | 18.43 | R6.11 | R41.46 | 1.02 | 1.64 | 0.55 | — | 0.42 | 8.18 | 61.83 |
| 1978 | 1.90 | 2.41 | 3.29 | 1.95 | 4.95 | 0.99 | 1.94 | 18.85 | R6.27 | R42.54 | 1.11 | 1.79 | 0.62 | — | 0.48 | 8.48 | 64.16 |
| 1979 | 1.97 | 2.46 | 3.37 | 2.04 | 5.05 | 1.10 | 1.97 | 18.51 | R6.36 | R42.85 | 1.18 | 1.84 | 0.66 | — | 0.53 | 8.64 | 65.22 |
| 1980 | 1.87 | 2.26 | 3.08 | 1.93 | 4.96 | 1.27 | 1.73 | 17.06 | R6.08 | R40.24 | 1.15 | 1.77 | 0.64 | — | 0.54 | 9.00 | 63.07 |
| 1981 | 1.77 | 2.02 | 2.80 | 1.87 | 4.85 | 1.40 | 1.59 | 16.06 | R5.65 | R38.02 | 1.09 | 1.71 | 0.73 | — | 0.54 | 8.94 | 60.90 |
| 1982 | 1.58 | 1.88 | 2.74 | 1.78 | 4.58 | 1.48 | 1.59 | 15.30 | R5.44 | R36.37 | 1.06 | 1.66 | 0.74 | — | 0.53 | 9.08 | 59.50 |
| 1983 | 1.45 | 1.84 | 2.66 | 1.75 | 4.40 | 1.35 | 1.53 | 15.23 | R5.27 | R35.48 | 0.98 | 1.73 | 0.77 | — | 0.56 | 8.95 | 58.74 |
| 1984 | 1.47 | 1.75 | 2.66 | 1.65 | 4.58 | 1.45 | 1.85 | 15.73 | R5.15 | R36.29 | 1.03 | 1.74 | 0.82 | — | 0.59 | 8.91 | 59.84 |
| 1985 | 1.50 | 1.78 | 2.70 | 1.72 | 4.38 | 1.47 | 1.63 | 15.73 | R5.20 | R36.10 | 1.08 | 1.89 | 0.90 | — | 0.57 | 8.95 | 60.10 |
| 1986 | 1.51 | 1.77 | 2.86 | 1.74 | 4.44 | 1.49 | 1.65 | 16.28 | R5.41 | R37.13 | 1.24 | 2.00 | 0.95 | — | 0.61 | 8.98 | 61.76 |
| 1987 | 1.55 | 1.79 | 2.77 | 1.86 | 4.48 | 1.52 | 1.60 | 16.67 | R5.54 | R37.77 | 1.26 | 2.12 | 0.99 | — | 0.64 | 9.00 | 63.01 |
| 1988 | 1.69 | 1.80 | 2.74 | 1.84 | 4.75 | 1.55 | 1.70 | 17.28 | R5.61 | R38.97 | 1.30 | 2.28 | 1.08 | — | 0.73 | 8.89 | 64.83 |
| 1989 | 1.73 | 1.86 | 2.58 | 1.93 | 4.98 | 1.66 | 1.74 | 17.33 | R5.73 | R39.53 | 1.32 | 2.38 | 1.15 | — | 0.84 | 8.74 | 66.03 |
| 1990 | 1.69 | 1.82 | 2.66 | 1.87 | 5.14 | 1.73 | 1.75 | 16.99 | R5.84 | R39.49 | 1.34 | 2.30 | 1.17 | — | 1.03 | 8.39 | 66.16 |
| 1991 | 1.62 | 1.94 | 2.83 | 1.86 | 5.28 | 1.80 | 1.80 | 16.71 | R6.03 | R39.87 | 1.35 | 2.50 | 1.19 | — | 1.20 | 8.35 | 66.71 |
| 1992 | 1.64 | 1.93 | 2.84 | 1.94 | 5.45 | 1.83 | 1.80 | 17.03 | R6.14 | R40.60 | 1.37 | 2.66 | 1.28 | 4.42 | 1.46 | — | 66.57 |
| 1993 | R1.69 | R1.88 | 2.90 | R1.85 | R5.40 | 1.84 | R1.82 | 17.24 | R6.17 | R40.78 | R1.40 | R2.96 | 1.31 | R3.65 | 1.69 | — | R66.55 |
| 1994P | 1.73 | 1.83 | 2.88 | 1.84 | 5.67 | 1.87 | 1.84 | 17.72 | 6.37 | 41.75 | 1.43 | 3.18 | 1.34 | 3.33 | 1.70 | — | 67.87 |

[1] Organization for Economic Cooperation and Development. See Glossary for membership. "Other OECD" includes the United States territories of Puerto Rico, U.S. Virgin Islands, Guam, and Hawaiian Free Trade Zone. As of January 1, 1987, Hawaiian Free Trade Zone data are included in U.S. 50 States data.

[2] Through 1969, the data for Germany and Total OECD are for the former West Germany only. For 1970 through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

[3] Mexico, which joined the OECD on May 18, 1994, is included in the OECD for all years shown in this table.

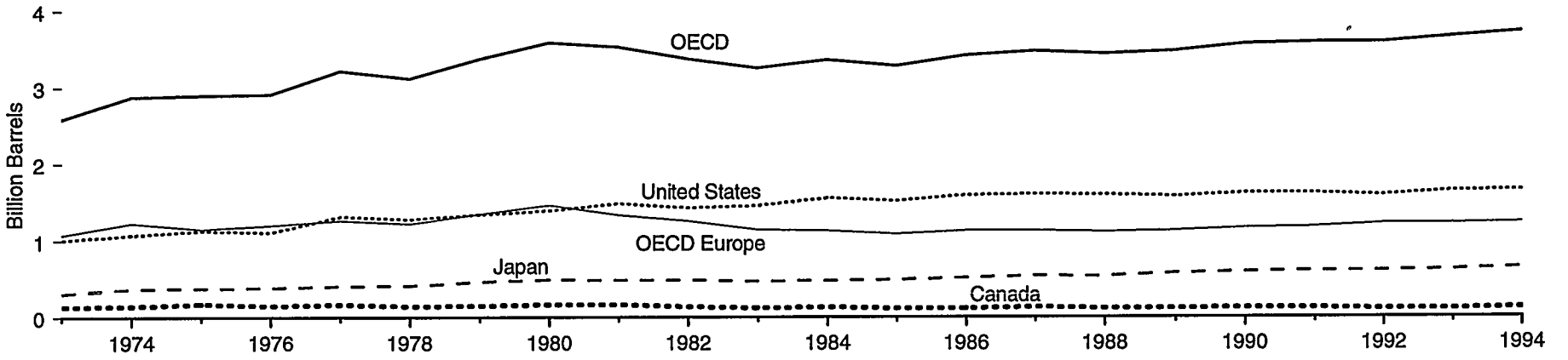
R=Revised data. P=Preliminary data. — = Not applicable.

Note: Totals may not equal sum of components due to independent rounding.

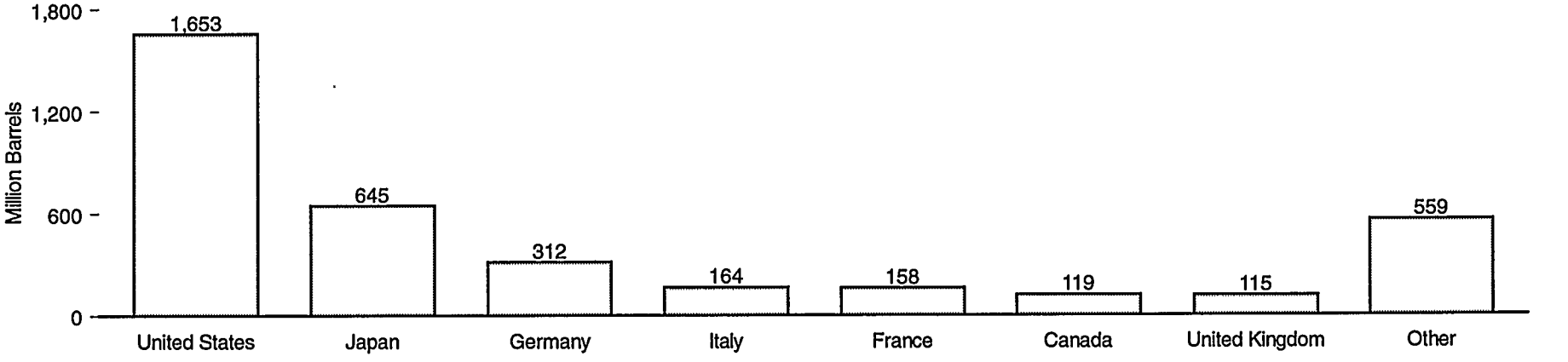
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

## Figure 11.10 Petroleum Stocks in OECD Countries, End of Year

**Total, 1973-1994**




**By Country, 1994**




Note: OECD=Organization for Economic Cooperation and Development. See Glossary for membership. Data for Mexico, which joined the OECD on May 18, 1994, are not available.

Source: Table 11.10.

# Table 11.10 Petroleum Stocks in OECD Countries, End of Year 1973-1994

(Million Barrels)

| Year | France | Germany [1] | Italy | United Kingdom | Other OECD [2] Europe | OECD Europe | Canada | Japan | United States | Other OECD [3] | OECD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 201 | 181 | 152 | 156 | 380 | 1,070 | 140 | 303 | 1,008 | 67 | 2,588 |
| 1974 | 249 | 213 | 167 | 191 | 437 | 1,227 | 145 | 370 | 1,074 | 64 | 2,880 |
| 1975 | 225 | 187 | 143 | 165 | 434 | 1,154 | 174 | 375 | 1,133 | 67 | 2,903 |
| 1976 | 234 | 208 | 143 | 165 | 455 | 1,205 | 153 | 380 | 1,112 | 68 | 2,918 |
| 1977 | 239 | 225 | 161 | 148 | 495 | 1,268 | 167 | 409 | 1,312 | 68 | 3,224 |
| 1978 | 201 | 238 | 154 | 157 | 469 | 1,219 | 144 | 413 | 1,278 | 68 | 3,122 |
| 1979 | 226 | 272 | 163 | 169 | 523 | 1,353 | 150 | 460 | 1,341 | 75 | 3,379 |
| 1980 | 243 | 319 | 170 | 168 | 564 | 1,464 | 164 | 495 | 1,392 | 72 | 3,587 |
| 1981 | 214 | 297 | 167 | 143 | 516 | 1,337 | 161 | 482 | 1,484 | 67 | 3,531 |
| 1982 | 193 | 272 | 179 | 125 | 489 | 1,258 | 136 | 484 | 1,430 | 68 | 3,376 |
| 1983 | 153 | 249 | 149 | 118 | 473 | 1,142 | 121 | 470 | 1,454 | 68 | 3,255 |
| 1984 | 152 | 239 | 159 | 112 | 468 | 1,130 | 128 | 479 | 1,556 | 69 | 3,362 |
| 1985 | 139 | 233 | 157 | 123 | 440 | 1,092 | 113 | 494 | 1,519 | 66 | 3,284 |
| 1986 | 127 | 252 | 155 | 124 | 475 | 1,133 | 111 | 509 | 1,593 | 72 | 3,418 |
| 1987 | 127 | 259 | 169 | 121 | 454 | 1,130 | 126 | 540 | 1,607 | 71 | 3,474 |
| 1988 | 140 | 266 | 155 | 112 | 445 | 1,118 | 116 | 538 | 1,597 | 71 | 3,440 |
| 1989 | 138 | 271 | 164 | 118 | 442 | 1,133 | 114 | 577 | 1,581 | 71 | 3,476 |
| 1990 | 140 | 265 | 172 | 112 | 474 | 1,163 | 121 | 590 | 1,621 | 73 | 3,568 |
| 1991 | 153 | 288 | 160 | 119 | 461 | 1,181 | 119 | 606 | 1,617 | 65 | 3,588 |
| 1992 | 146 | 310 | 174 | 113 | 476 | 1,219 | 107 | 603 | 1,592 | 67 | 3,588 |
| 1993 | 158 | R309 | R163 | 118 | R475 | R1,221 | R105 | R618 | 1,647 | R69 | R3,661 |
| 1994 | 158 | 312 | 164 | 115 | 490 | 1,240 | 119 | 645 | 1,653 | 69 | 3,726 |

[1] Through 1990, the data for Germany are for the former West Germany only. Beginning in 1991, the data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.

[2] Organization for Economic Cooperation and Development (OECD). See Glossary for membership.

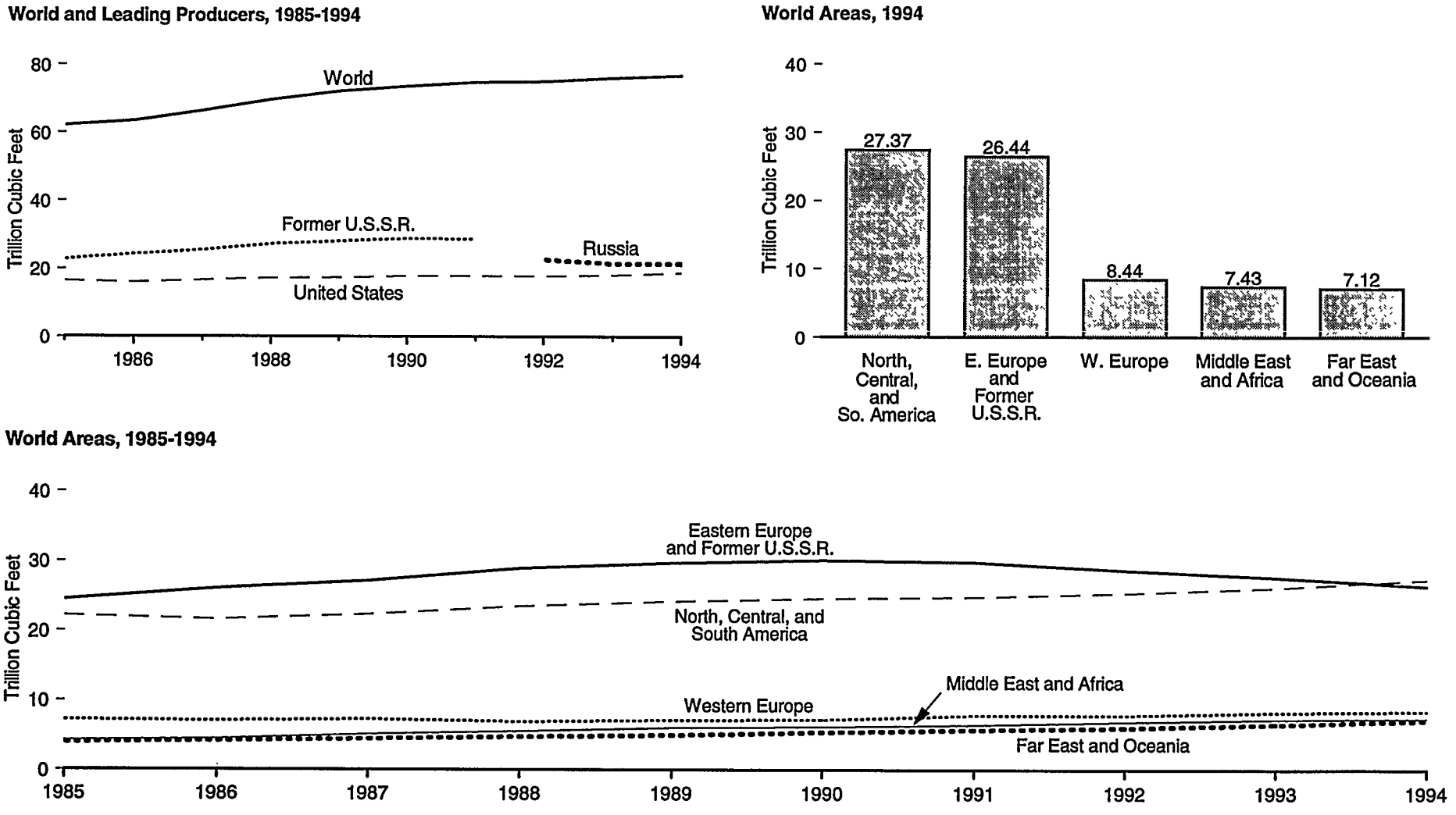
[3] Australia, New Zealand, and United States Territories. Data for Mexico, which joined the OECD on May 18, 1994, are not available.

R=Revised data.

Notes: • Includes crude oil, lease condensate, natural gas plant liquids, unfinished oils, and finished petroleum products. See Note 2 at end of section. • Organization for Economic Cooperation and Development (OECD). See Glossary for membership. • Totals may not equal sum of components due to independent rounding.

Sources: **United States:** Table 5.14. **All Other Data:** OECD, International Energy Agency, Monthly Oil Statistics Database.

# Figure 11.11 World Dry Natural Gas Production




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.11.

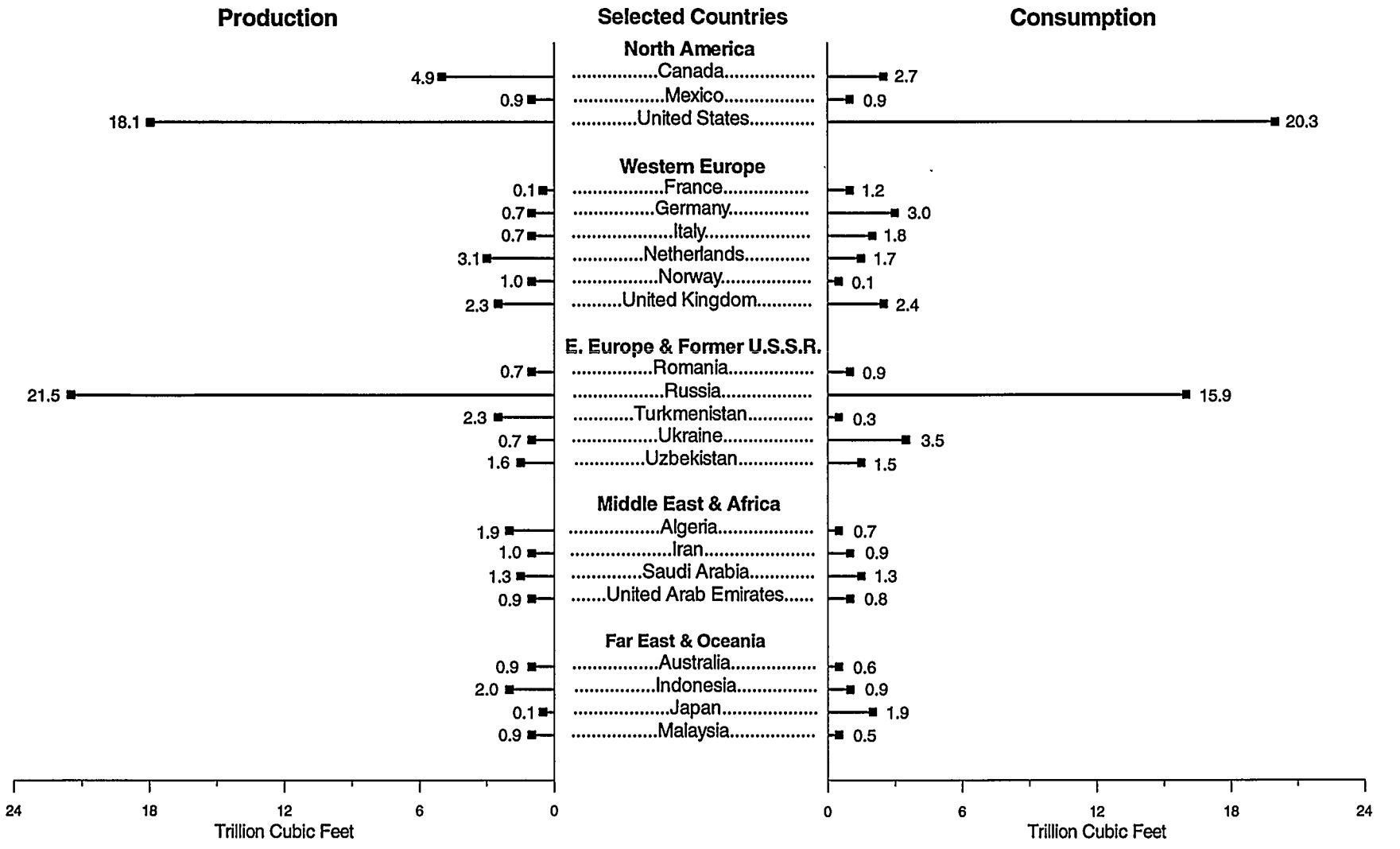
# Table 11.11 World Dry Natural Gas Production, 1985-1994

(Trillion Cubic Feet)

| Region and Country | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 P |
|---|---|---|---|---|---|---|---|---|---|---|
| **North, Central, and South America** | **22.21** | **21.62** | **22.33** | **23.47** | **24.16** | R24.62 | R24.84 | R25.42 | R26.20 | **27.37** |
| Argentina | 0.50 | 0.55 | 0.53 | 0.63 | 0.72 | 0.63 | R0.70 | R0.71 | R0.76 | 0.78 |
| Canada | 3.04 | 2.86 | 3.10 | 3.57 | 3.80 | R3.85 | R4.06 | R4.52 | R4.91 | 5.27 |
| Mexico | 0.95 | 0.92 | 0.86 | 0.92 | 0.93 | 0.94 | 0.94 | 0.92 | R0.90 | 0.91 |
| United States | 16.45 | 16.06 | 16.62 | 17.10 | 17.31 | 17.81 | 17.70 | 17.84 | R18.10 | 18.75 |
| Venezuela | 0.62 | 0.67 | 0.66 | 0.66 | 0.77 | R0.76 | R0.79 | 0.76 | R0.82 | 0.88 |
| Other | 0.65 | 0.56 | 0.55 | 0.59 | 0.64 | R0.62 | 0.65 | R0.66 | R0.73 | 0.78 |
| **Western Europe** | **7.22** | **7.07** | **7.32** | **6.91** | **7.16** | **7.19** | **7.83** | **7.89** | R8.32 | **8.44** |
| Germany [1] | 0.77 | 0.71 | 0.79 | 0.74 | 0.71 | R0.66 | 0.67 | 0.68 | R0.68 | 0.71 |
| Italy | 0.50 | 0.56 | 0.58 | 0.59 | 0.60 | 0.61 | 0.61 | 0.64 | R0.69 | 0.73 |
| Netherlands | 3.01 | 2.76 | 2.77 | 2.45 | 2.67 | 2.69 | 3.04 | 3.06 | 3.11 | 2.95 |
| Norway | 0.94 | 0.99 | 1.06 | 1.05 | 1.09 | 0.98 | 0.97 | 1.04 | R0.97 | 1.04 |
| United Kingdom | 1.52 | 1.60 | 1.68 | 1.62 | 1.58 | 1.75 | 2.01 | 1.93 | 2.31 | 2.47 |
| Other | 0.45 | 0.45 | 0.44 | 0.46 | 0.51 | R0.50 | R0.53 | R0.54 | R0.56 | 0.54 |
| **Eastern Europe and Former U.S.S.R.** | **24.50** | **26.03** | **27.14** | **28.95** | **29.70** | **30.13** | **29.85** | R28.68 | R27.68 | **26.44** |
| Romania | 1.27 | 1.34 | 1.32 | 1.28 | 1.13 | 1.00 | 0.88 | 0.78 | 0.75 | 0.69 |
| Russia | — | — | — | — | — | — | — | 22.62 | R21.49 | 21.43 |
| Turkmenistan | — | — | — | — | — | — | — | R2.12 | R2.30 | 1.26 |
| Ukraine | — | — | — | — | — | — | — | R0.74 | R0.68 | 0.65 |
| Former U.S.S.R. | 22.71 | 24.19 | 25.36 | 27.19 | 28.11 | 28.78 | 28.62 | — | — | — |
| Uzbekistan | — | — | — | — | — | — | — | R1.51 | R1.59 | 1.67 |
| Other | 0.53 | 0.51 | 0.46 | 0.47 | 0.46 | 0.35 | 0.35 | R0.91 | R0.88 | 0.75 |
| **Middle East and Africa** | **4.24** | **4.51** | **5.13** | **5.55** | **6.08** | **6.17** | **6.52** | R6.91 | R7.24 | **7.43** |
| Algeria | 1.36 | 1.33 | 1.52 | 1.63 | 1.71 | 1.79 | 1.93 | 1.97 | R1.90 | 1.78 |
| Egypt | 0.18 | 0.20 | 0.22 | 0.24 | 0.27 | 0.29 | 0.32 | 0.35 | 0.40 | 0.42 |
| Iran | 0.60 | 0.54 | 0.56 | 0.71 | 0.78 | 0.84 | 0.92 | 0.88 | R0.96 | 1.12 |
| Qatar | 0.19 | 0.19 | 0.20 | 0.21 | 0.22 | 0.28 | 0.33 | 0.40 | R0.48 | 0.48 |
| Saudi Arabia | 0.72 | 0.89 | 0.95 | 1.03 | 1.05 | 1.08 | 1.13 | 1.20 | 1.27 | 1.33 |
| United Arab Emirates | 0.48 | 0.54 | 0.68 | 0.66 | 0.81 | 0.78 | 0.92 | 1.02 | R0.94 | 0.95 |
| Other | R0.71 | R0.82 | R1.00 | R1.07 | R1.24 | R1.13 | R0.98 | R1.08 | R1.30 | 1.35 |
| **Far East and Oceania** | **4.00** | **4.21** | **4.50** | **4.78** | **4.98** | **5.44** | **5.76** | R6.07 | R6.55 | **7.12** |
| Australia | 0.46 | 0.52 | 0.53 | 0.56 | 0.57 | 0.72 | 0.75 | 0.82 | 0.86 | 0.93 |
| China | 0.46 | 0.48 | 0.49 | 0.49 | 0.51 | 0.51 | 0.53 | 0.53 | 0.56 | 0.59 |
| India | 0.14 | 0.18 | 0.23 | 0.31 | 0.32 | 0.40 | 0.45 | 0.48 | R0.53 | 0.59 |
| Indonesia | 1.23 | 1.18 | 1.29 | 1.34 | 1.42 | 1.53 | 1.72 | 1.79 | R1.97 | 2.24 |
| Malaysia | 0.44 | 0.53 | 0.55 | 0.58 | 0.61 | 0.65 | 0.75 | 0.80 | 0.88 | 0.92 |
| Pakistan | 0.37 | 0.39 | 0.42 | 0.44 | 0.47 | 0.48 | 0.53 | 0.55 | 0.58 | 0.63 |
| Other | 0.93 | 0.93 | 0.98 | 1.05 | 1.08 | 1.15 | R1.03 | R1.10 | R1.16 | 1.23 |
| **World** | **62.17** | **63.45** | **66.41** | **69.65** | **72.09** | R73.56 | R74.81 | R74.97 | R76.00 | **76.80** |

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.
R=Revised data. P=Preliminary data. — = Not applicable.
Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

## Figure 11.12 World Dry Natural Gas Supply and Disposition, 1993




Source: Table 11.12.

# Table 11.12 World Dry Natural Gas Supply and Disposition, 1993

(Billion Cubic Feet)

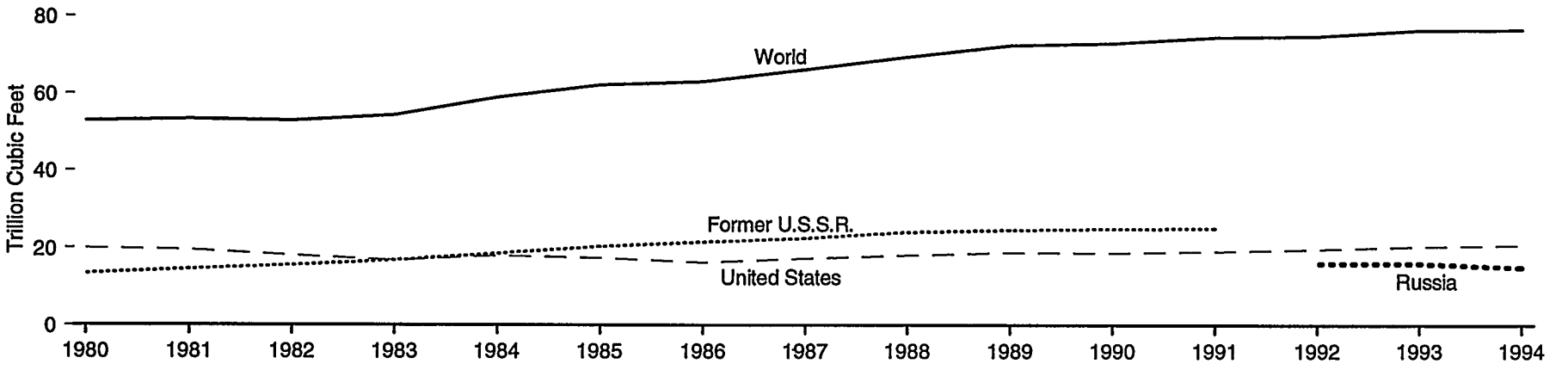
| Region and Country | Supply | | Disposition | |
|---|---|---|---|---|
| | Dry Natural Gas Production | Imports [1] | Exports [1] | Apparent Consumption [2] |
| **North, Central, and South America** | **26,204** | **2,492** | **2,441** | **26,229** |
| Argentina | 760 | 73 | 0 | 833 |
| Canada | 4,910 | 29 | 2,226 | 2,713 |
| Mexico | 898 | 40 | 2 | 936 |
| United States | 18,095 | 2,350 | 140 | 20,279 |
| Venezuela | 815 | 0 | 0 | 815 |
| Other | 726 | 0 | 73 | 653 |
| **Western Europe** | **8,321** | **6,170** | **2,594** | **11,936** |
| Belgium and Luxembourg | (s) | 416 | 0 | 416 |
| France | 115 | 1,047 | 20 | 1,172 |
| Germany | 678 | 2,399 | 65 | 3,042 |
| Italy | 688 | 1,135 | 1 | 1,801 |
| Netherlands | 3,112 | 137 | 1,552 | 1,696 |
| Norway | 967 | 0 | 877 | 90 |
| United Kingdom | 2,313 | 149 | 22 | 2,440 |
| Other | 448 | 887 | 57 | 1,278 |
| **Eastern Europe and Former U.S.S.R.** | **27,684** | **6,080** | **8,148** | **25,614** |
| Czech Republic | 8 | 249 | (s) | 257 |
| Hungary | 189 | 187 | 0 | 376 |
| Kazakstan | 237 | 251 | 0 | 487 |
| Poland | 175 | 208 | 0 | 383 |
| Romania | 746 | 162 | 0 | 908 |
| Russia | 21,489 | 370 | 5,919 | 15,940 |
| Turkmenistan | 2,303 | 0 | 1,967 | 335 |
| Ukraine | 678 | 2,835 | 7 | 3,507 |
| Uzbekistan | 1,591 | 206 | 256 | 1,541 |
| Other | 269 | 1,612 | (s) | 1,878 |
| **Middle East and Africa** | **7,237** | **40** | **1,460** | **5,816** |
| Algeria | 1,902 | 0 | 1,247 | 655 |
| Egypt | 399 | 0 | 0 | 399 |
| Iran | 956 | 0 | 18 | 938 |
| Qatar | 477 | 0 | 0 | 477 |
| Saudi Arabia | 1,268 | 0 | 0 | 1,268 |
| United Arab Emirates | 937 | 0 | 139 | 798 |
| Other | 1,299 | 40 | 57 | 1,282 |
| **Far East and Oceania** | **6,551** | **2,212** | **2,043** | **6,720** |
| Australia | 864 | 0 | 234 | 630 |
| China | 558 | 0 | 0 | 558 |
| India | 532 | 0 | 0 | 532 |
| Indonesia | 1,973 | 0 | 1,123 | 850 |
| Japan | 77 | 1,873 | 0 | 1,949 |
| Malaysia | 880 | 0 | 423 | 458 |
| Pakistan | 583 | 0 | 0 | 583 |
| Other | 1,084 | 340 | 264 | 1,160 |
| **World** | **75,995** | **16,994** | **16,686** | **76,315** |

[1] Includes liquefied natural gas.
[2] Includes stock changes.
(s)=Less than 500 million cubic feet.

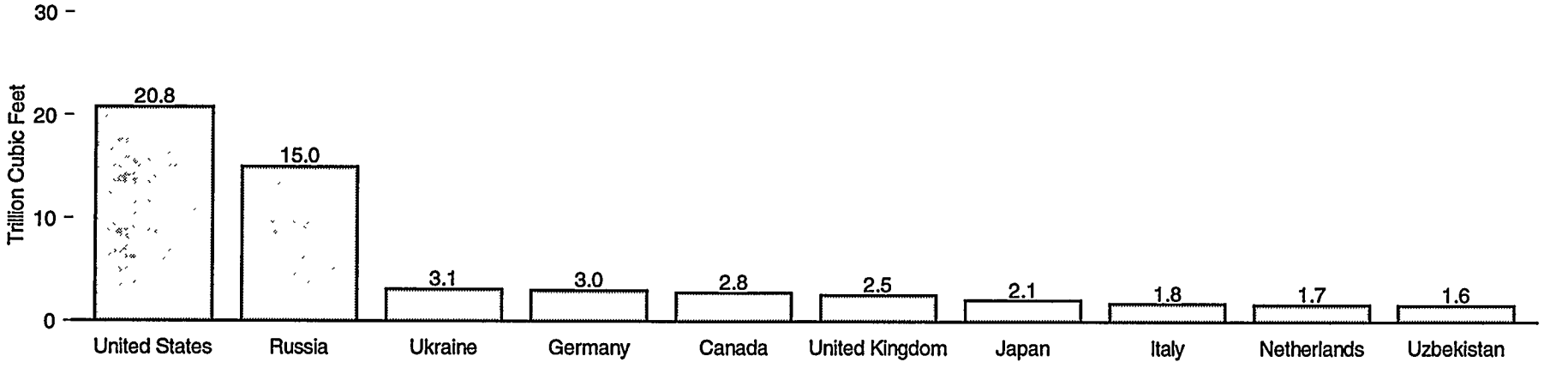
Note: Totals may not equal sum of components due to independent rounding.
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.13 World Dry Natural Gas Consumption

**World and Leading Consumers, 1980-1994**




**Top Consuming Countries, 1994**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.13.

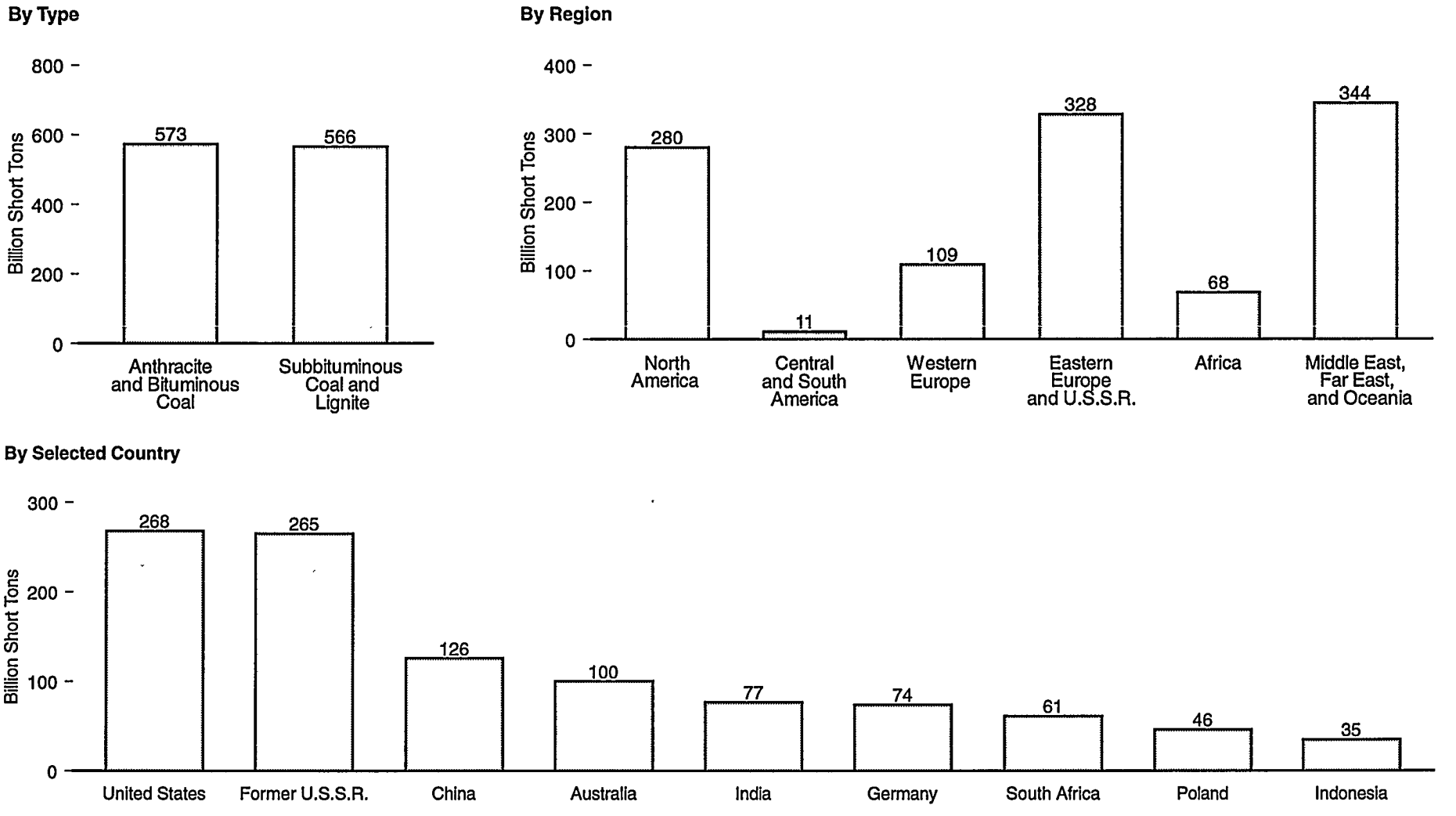
# Table 11.13 World Dry Natural Gas Consumption, 1980-1994

(Billion Cubic Feet)

| Year | Canada | France | Germany[1] | Italy | Iran | Japan | Mexico | Nether-lands | Russia | Saudi Arabia | Ukraine | United Kingdom | United States | Former U.S.S.R. | Uzbek-istan | Other | World |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | 1,883 | 1,006 | 2,465 | 973 | 232 | 903 | 908 | 1,493 | — | 517 | — | 1,702 | 19,877 | 13,328 | — | R7,643 | 52,930 |
| 1981 | 1,708 | 996 | 2,359 | 983 | 155 | 886 | 930 | 1,421 | — | 460 | — | 1,671 | 19,404 | 14,440 | — | R7,865 | 53,278 |
| 1982 | 1,664 | 913 | 2,189 | 989 | 200 | 919 | 1,016 | 1,511 | — | 201 | — | 1,570 | 18,001 | 15,522 | — | R8,260 | 52,955 |
| 1983 | 1,807 | 1,049 | 2,274 | 1,009 | 310 | 1,008 | 1,078 | 1,371 | — | 200 | — | 1,774 | 16,835 | 16,822 | — | R8,844 | 54,381 |
| 1984 | 1,855 | 1,029 | 2,372 | 1,171 | 476 | 1,367 | 990 | 1,395 | — | 253 | — | 1,900 | 17,951 | 18,512 | — | R9,583 | 58,854 |
| 1985 | 2,165 | 1,120 | 2,369 | 1,156 | 600 | 1,468 | 955 | 1,613 | — | 716 | — | 1,991 | 17,281 | 20,302 | — | R10,325 | 62,061 |
| 1986 | 2,131 | 1,127 | 2,408 | 1,238 | 536 | 1,494 | 923 | 1,620 | — | 890 | — | 2,020 | 16,221 | 21,522 | — | R10,876 | 63,006 |
| 1987 | 2,112 | 1,057 | 2,592 | 1,371 | 565 | 1,543 | 865 | 1,672 | — | 946 | — | 2,079 | 17,211 | 22,462 | — | R11,665 | 66,140 |
| 1988 | 2,331 | 961 | 2,519 | 1,460 | 706 | 1,618 | 926 | 1,513 | — | 1,028 | — | 1,972 | 18,030 | 24,092 | — | R12,243 | 69,399 |
| 1989 | 2,498 | 991 | 2,635 | 1,578 | 784 | 1,731 | 943 | 1,550 | — | 1,052 | — | 1,951 | 18,801 | 24,529 | — | R13,270 | 72,313 |
| 1990 | R2,378 | 1,022 | 2,624 | 1,672 | 837 | 1,851 | 946 | 1,538 | — | 1,077 | — | 2,059 | 18,716 | 24,961 | — | R13,236 | R72,916 |
| 1991 | R2,400 | 1,143 | 2,883 | 1,773 | 811 | 1,976 | 994 | 1,715 | — | 1,130 | — | 2,218 | 19,035 | 25,014 | — | R13,430 | R74,522 |
| 1992 | R2,596 | 1,139 | 2,858 | 1,757 | 883 | 2,023 | 1,015 | 1,669 | 15,967 | 1,201 | R3,920 | 2,127 | 19,544 | — | R1,353 | R16,780 | R74,831 |
| 1993 | R2,713 | R1,172 | R3,042 | 1,801 | 938 | R1,949 | R936 | R1,696 | R15,940 | 1,268 | R3,507 | R2,440 | R20,279 | — | R1,541 | R17,092 | R76,315 |
| 1994P | 2,785 | 1,226 | 2,965 | 1,777 | 1,123 | 2,083 | 943 | 1,667 | 14,988 | 1,331 | 3,083 | 2,547 | 20,755 | — | 1,564 | 17,681 | 76,519 |

[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.
R=Revised data. P=Preliminary data. — = Not applicable.
Note: Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.
Sources: **United States:** Table 6.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

## Figure 11.14 World Recoverable Reserves of Coal




Notes: • Recoverable reserves are as of December 31, 1993, except for U. S. recoverable reserves, which are as of December 31, 1994. • Because vertical scales differ, graphs should not be compared.

Source: Table 11.14.

# Table 11.14 World Recoverable Reserves of Coal

(Million Short Tons)

| Region and Country | Anthracite and Bituminous Coal | Subbituminous Coal and Lignite | Total |
|---|---|---|---|
| **North America** | **124,091** | **155,411** | **279,502** |
| Canada | 4,970 | 4,535 | 9,505 |
| Mexico | 948 | 387 | 1,335 |
| United States [1] | 118,173 | 150,287 | 268,460 |
| Other | 0 | 202 | 202 |
| **Central and South America** | **6,227** | **5,013** | **11,240** |
| Brazil | 0 | 3,136 | 3,136 |
| Chile | 34 | 1,268 | 1,302 |
| Colombia | 4,674 | 330 | 5,003 |
| Peru | 1,058 | 110 | 1,168 |
| Other | 461 | 170 | 631 |
| **Western Europe** | **30,544** | **78,281** | **108,825** |
| Germany | 26,455 | 47,730 | 74,186 |
| Greece | 0 | 3,307 | 3,307 |
| Spain | 937 | 661 | 1,598 |
| Turkey | 179 | 7,701 | 7,879 |
| United Kingdom | 2,205 | 551 | 2,756 |
| Former Yugoslavia | 70 | 18,152 | 18,222 |
| Other | 698 | 179 | 877 |
| **Eastern Europe and U.S.S.R.** | **149,200** | **179,232** | **328,431** |
| Bulgaria | 14 | 2,974 | 2,988 |
| Former Czechoslovakia | 1,810 | 3,858 | 5,668 |
| Hungary | 657 | 4,260 | 4,917 |
| Poland | 32,077 | 14,330 | 46,407 |
| Romania | 1 | 3,436 | 3,437 |
| Slovakia | 0 | 251 | 251 |
| Former U.S.S.R. | 114,640 | 150,122 | 264,762 |
| **Africa** | **66,585** | **1,397** | **67,982** |
| Botswana | 3,858 | 0 | 3,858 |
| South Africa | 60,994 | 0 | 60,994 |
| Swaziland | 128 | 1,101 | 1,229 |
| Zimbabwe | 809 | 0 | 809 |
| Other | 796 | 295 | 1,091 |
| **Middle East, Far East, and Oceania** | **196,630** | **146,941** | **343,571** |
| Australia | 49,979 | 50,265 | 100,244 |
| China | 68,564 | 57,651 | 126,215 |
| India | 75,009 | 2,094 | 77,103 |
| Indonesia | 1,060 | 34,283 | 35,343 |
| Japan | 886 | 19 | 905 |
| Pakistan | 0 | 809 | 809 |
| Thailand | 0 | 1,101 | 1,101 |
| Other | 1,132 | 718 | 1,850 |
| **World** | **573,277** | **566,274** | **1,139,551** |

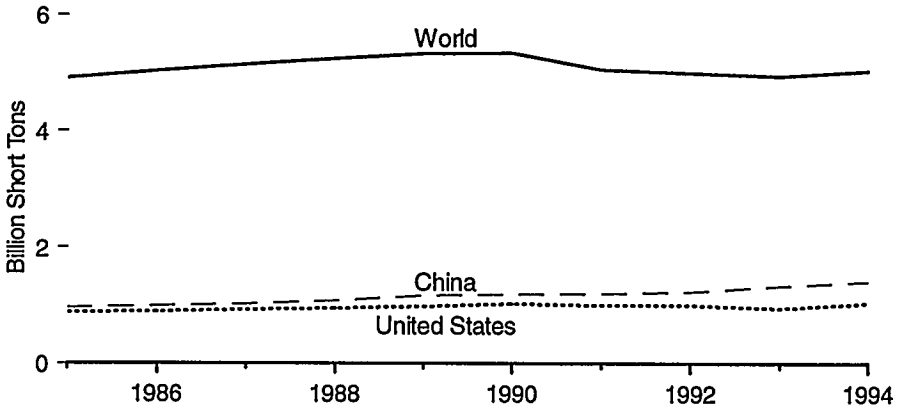
[1] U.S. data are more current than other data on this table. They represent recoverable reserves as of December 31, 1994; data for the other countries are as of December 31, 1993, the most recent period for which they are available. U.S. reserves represent both measured and indicated tonnage. The U.S. term "measured" approximates the term "proved," which is used by the World Energy Council. The U.S. "measured and indicated" data have been combined prior to depletion adjustments and cannot be recaptured as "measured alone."

Notes: • World Energy Council definition of "Proved Recoverable Reserves" is the tonnage of Proved Amount in Place that can be recovered (extracted from the earth in raw form) under present and expected local economic conditions with existing technology. • The EIA does not certify the international reserves data but reproduces the information as a matter of convenience for the reader. • Totals may not equal sum of components due to independent rounding.

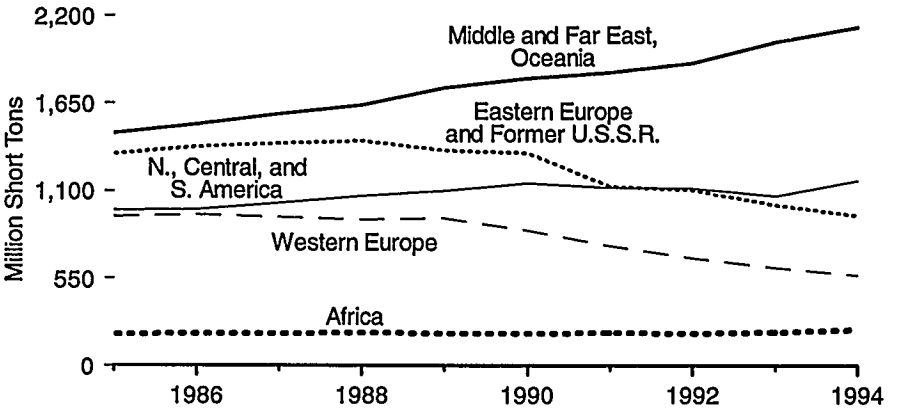
Sources: **United States:** Energy Information Administration, Unpublished File Data of the Coal Reserves Database, (October 1995). **All Other Data:** World Energy Council, *1995 Survey of Energy Resources*. World Energy Conference (1995).

# Figure 11.15 World Coal Production

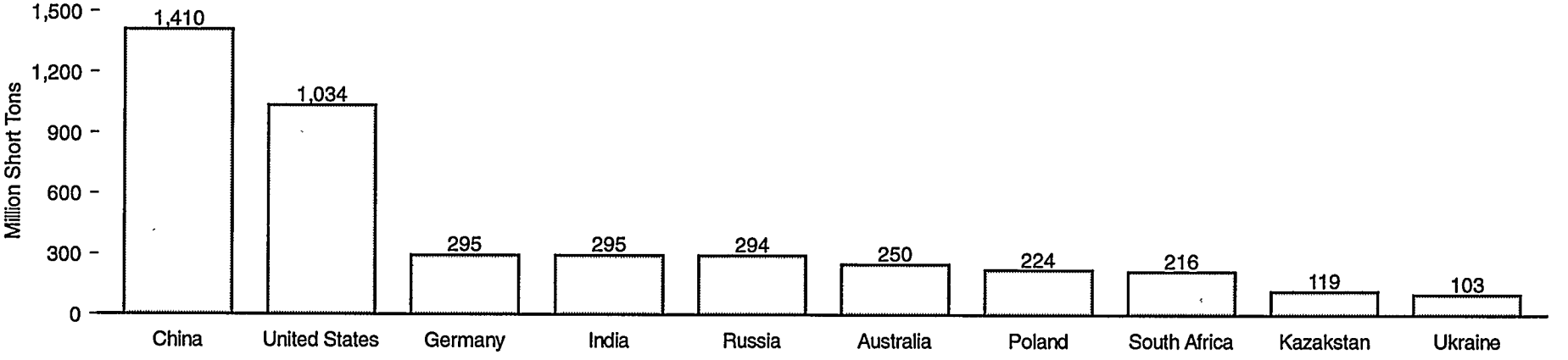
**World and Leading Producers, 1985-1994**




**World Areas, 1985-1994**




**Top Producing Countries, 1994**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.15.

# Table 11.15 World Coal Production, 1985-1994

(Million Short Tons)

| Region and Country | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 P |
|---|---|---|---|---|---|---|---|---|---|---|
| **North, Central, and South America** | R978 | R984 | R1,021 | R1,065 | R1,100 | R1,146 | R1,120 | R1,113 | R1,066 | 1,163 |
| Canada | 67 | 64 | 67 | 78 | 78 | 75 | 78 | 72 | 76 | 80 |
| Colombia | R10 | 12 | 16 | 17 | 21 | 23 | 26 | 26 | 26 | 28 |
| Mexico | 7 | 7 | 9 | 8 | 8 | 9 | 8 | 7 | 7 | 10 |
| United States | 884 | 890 | 919 | 950 | 981 | 1,029 | 996 | 998 | 945 | 1,034 |
| Other | R11 | R11 | R10 | R12 | R13 | R10 | R11 | R10 | R11 | 11 |
| **Western Europe** | R939 | R951 | R935 | R917 | R926 | R850 | R753 | R676 | R617 | 570 |
| France | R21 | R20 | R21 | R16 | R16 | R14 | R13 | R12 | R8 | 7 |
| Germany[1] | 578 | 568 | 554 | 552 | 540 | 479 | R389 | 346 | R319 | 295 |
| Greece | 40 | 42 | 49 | R53 | 57 | 57 | 58 | 61 | R60 | 63 |
| Serbia and Montenegro | — | — | — | — | — | — | — | 47 | 41 | 41 |
| Spain | R53 | R52 | R47 | R45 | R48 | R48 | R44 | R44 | R42 | 40 |
| Turkey | R49 | R57 | R57 | R48 | R64 | R57 | R61 | 57 | R53 | 60 |
| United Kingdom | 104 | 119 | 115 | 115 | 111 | 104 | 105 | 94 | 75 | 53 |
| Former Yugoslavia | 77 | 77 | 79 | 80 | 82 | 84 | R78 | — | — | — |
| Other | R18 | R15 | R12 | R8 | R7 | 6 | 5 | R15 | R18 | 12 |
| **Eastern Europe and Former U.S.S.R.** | 1,331 | 1,374 | 1,397 | 1,411 | R1,353 | R1,335 | R1,129 | R1,104 | R1,013 | 941 |
| Bulgaria | 34 | 39 | 41 | 38 | 38 | 35 | R31 | 33 | 32 | 32 |
| Czech Republic | — | — | — | — | — | — | — | — | R94 | 89 |
| Estonia | — | — | — | — | — | — | — | 21 | 16 | 16 |
| Hungary | 27 | R25 | 25 | 23 | R22 | R19 | 19 | R18 | R14 | 13 |
| Kazakstan | — | — | — | — | — | — | — | R141 | R128 | 119 |
| Poland | 275 | 286 | 293 | 294 | 275 | 237 | 231 | 219 | R219 | 224 |
| Romania | 51 | 52 | 57 | 65 | 68 | 42 | R36 | R43 | R40 | 41 |
| Russia | — | — | — | — | — | — | — | R372 | R332 | 294 |
| Ukraine | — | — | — | — | — | — | — | 147 | 128 | 103 |
| Former U.S.S.R. | 801 | 828 | 838 | 851 | 816 | R882 | R702 | — | — | — |
| Other | R144 | R143 | R143 | R141 | R134 | R120 | R111 | R111 | R10 | 9 |
| **Africa** | 197 | 202 | 203 | 208 | R202 | 201 | R205 | R201 | R209 | 225 |
| South Africa | 191 | 195 | 195 | 200 | 194 | 193 | R196 | R192 | 201 | 216 |
| Other | 6 | 7 | 8 | 8 | 8 | R8 | 9 | 9 | R8 | 9 |
| **Middle East, Far East, and Oceania** | R1,461 | R1,519 | R1,583 | R1,637 | R1,747 | R1,805 | R1,844 | R1,902 | R2,037 | 2,129 |
| Australia | 172 | 187 | 209 | 196 | 216 | 226 | 236 | 248 | R247 | 250 |
| China | 962 | 986 | 1,023 | 1,080 | 1,162 | 1,190 | 1,199 | R1,231 | R1,331 | 1,410 |
| India | R191 | R207 | R209 | R211 | R220 | R235 | R252 | R262 | R290 | 295 |
| Indonesia | 2 | 3 | 4 | 5 | 9 | 12 | R15 | R23 | 30 | 32 |
| Japan | 19 | 15 | 15 | 14 | 13 | 11 | 10 | 9 | 8 | 8 |
| Mongolia | 8 | 9 | 9 | 10 | 10 | 10 | 9 | 8 | 8 | 8 |
| North Korea | R61 | R62 | R64 | R68 | R71 | R74 | R75 | R74 | R78 | 79 |
| South Korea | 25 | 27 | 27 | 27 | 23 | 19 | 17 | 13 | 10 | 8 |
| Thailand | 6 | 6 | 8 | 8 | 10 | 14 | 16 | 17 | R17 | 19 |
| Other | R16 | R17 | R17 | R18 | R14 | R15 | R15 | R16 | R18 | 18 |
| **World** | R4,906 | R5,029 | R5,139 | R5,238 | R5,329 | R5,337 | R5,052 | 4,996 | R4,943 | 5,027 |

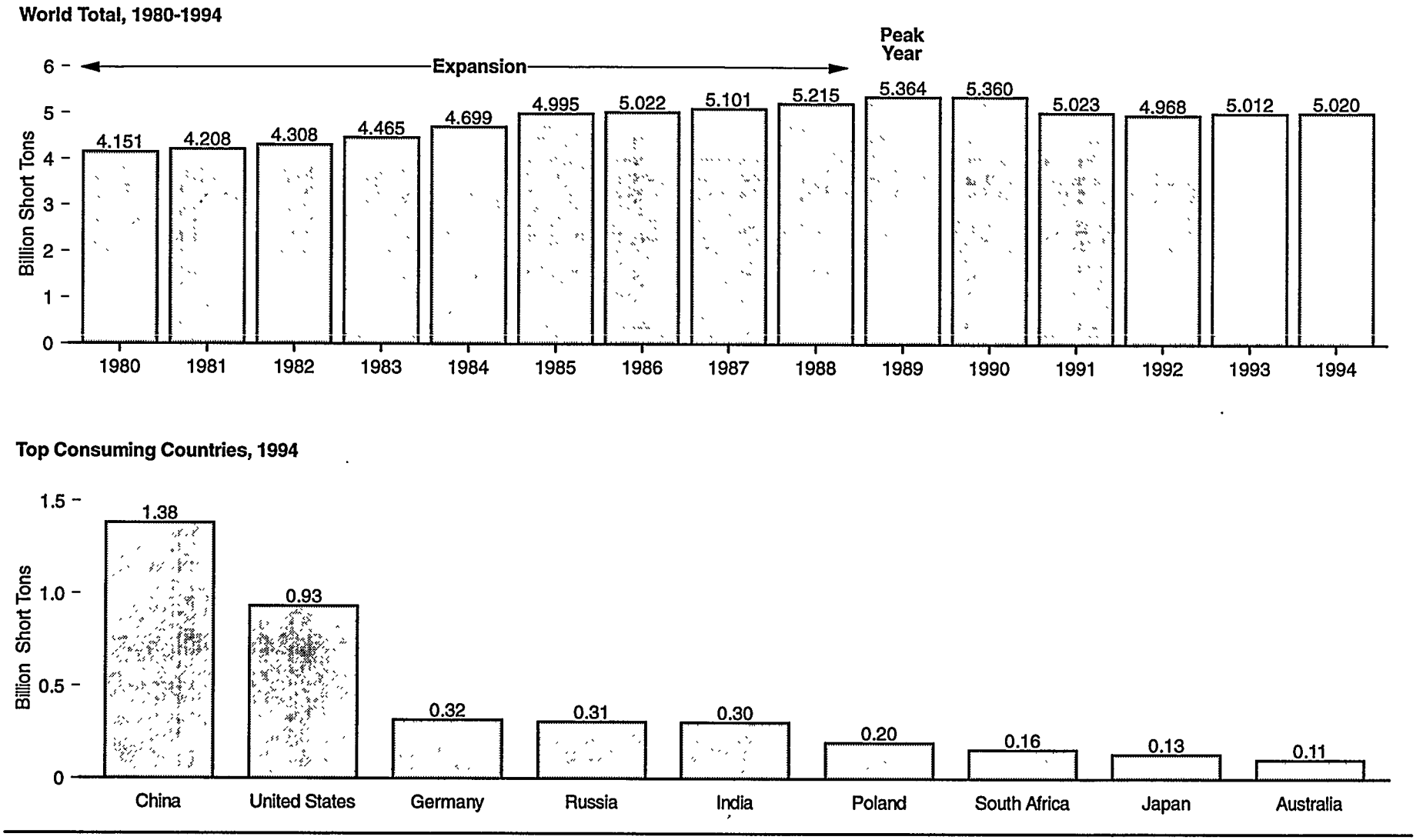
[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

R=Revised data. P=Preliminary data. — = Not applicable.

Notes: • Coal includes anthracite, subanthracite, bituminous coal, subbituminous coal, lignite, and brown coal. • Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.16 World Coal Consumption




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.16.

# Table 11.16 World Coal Consumption, 1980-1994

(Million Short Tons)

| Year | Australia | China | Czech Republic | Germany [1] | India | Japan | Kazak-stan | North Korea | Poland | Russia | South Africa | Ukraine | United Kingdom | United States | Former U.S.S.R. | Other | World |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1980 | 74 | 677 | — | 535 | 130 | 98 | — | 53 | 221 | — | 105 | — | 133 | 703 | 751 | 670 | 4,151 |
| 1981 | 75 | 669 | — | 544 | 139 | 106 | — | 53 | 200 | — | 117 | — | 130 | 733 | 755 | 687 | 4,208 |
| 1982 | 80 | 733 | — | 548 | 147 | 105 | — | 54 | 208 | — | 123 | — | 122 | 707 | 773 | 707 | 4,308 |
| 1983 | 78 | 797 | — | 549 | 161 | 100 | — | 58 | 213 | — | 127 | — | 123 | 737 | 773 | 750 | 4,465 |
| 1984 | 80 | 884 | — | 562 | 180 | 113 | — | 62 | 227 | — | 137 | — | 88 | 791 | 769 | 805 | 4,699 |
| 1985 | 86 | 999 | — | 585 | 194 | 119 | — | 64 | 238 | — | 142 | — | 116 | 818 | 777 | 857 | 4,995 |
| 1986 | 85 | 994 | — | 576 | 208 | 109 | — | 65 | 247 | — | 145 | — | 123 | 804 | 801 | 865 | 5,022 |
| 1987 | 93 | 996 | — | 565 | 206 | 111 | — | 67 | 258 | — | 148 | — | 129 | 837 | 804 | 886 | 5,101 |
| 1988 | 96 | 1,034 | — | 561 | 212 | 123 | — | 71 | 254 | — | 153 | — | 123 | 884 | 815 | 890 | 5,215 |
| 1989 | 104 | 1,188 | — | 553 | 224 | 123 | — | 74 | 242 | — | 143 | — | 126 | 890 | 777 | 920 | 5,364 |
| 1990 | 116 | 1,235 | — | 492 | 243 | 122 | — | 76 | 202 | — | 138 | — | 116 | 895 | 848 | 875 | 5,360 |
| 1991 | 113 | 1,165 | — | 402 | 252 | 130 | — | 78 | 202 | — | 143 | — | 118 | 888 | 673 | 859 | 5,023 |
| 1992 | 111 | 1,213 | — | 359 | 266 | 126 | 99 | 76 | 192 | 366 | 139 | 153 | 111 | 892 | — | 864 | 4,968 |
| 1993 | 101 | 1,303 | 88 | 340 | 295 | 128 | 94 | 80 | 194 | 344 | 144 | 132 | 97 | 926 | — | 746 | 5,012 |
| 1994[P] | 105 | 1,380 | 84 | 316 | 303 | 133 | 87 | 81 | 195 | 305 | 156 | 104 | 71 | 930 | — | 769 | 5,020 |

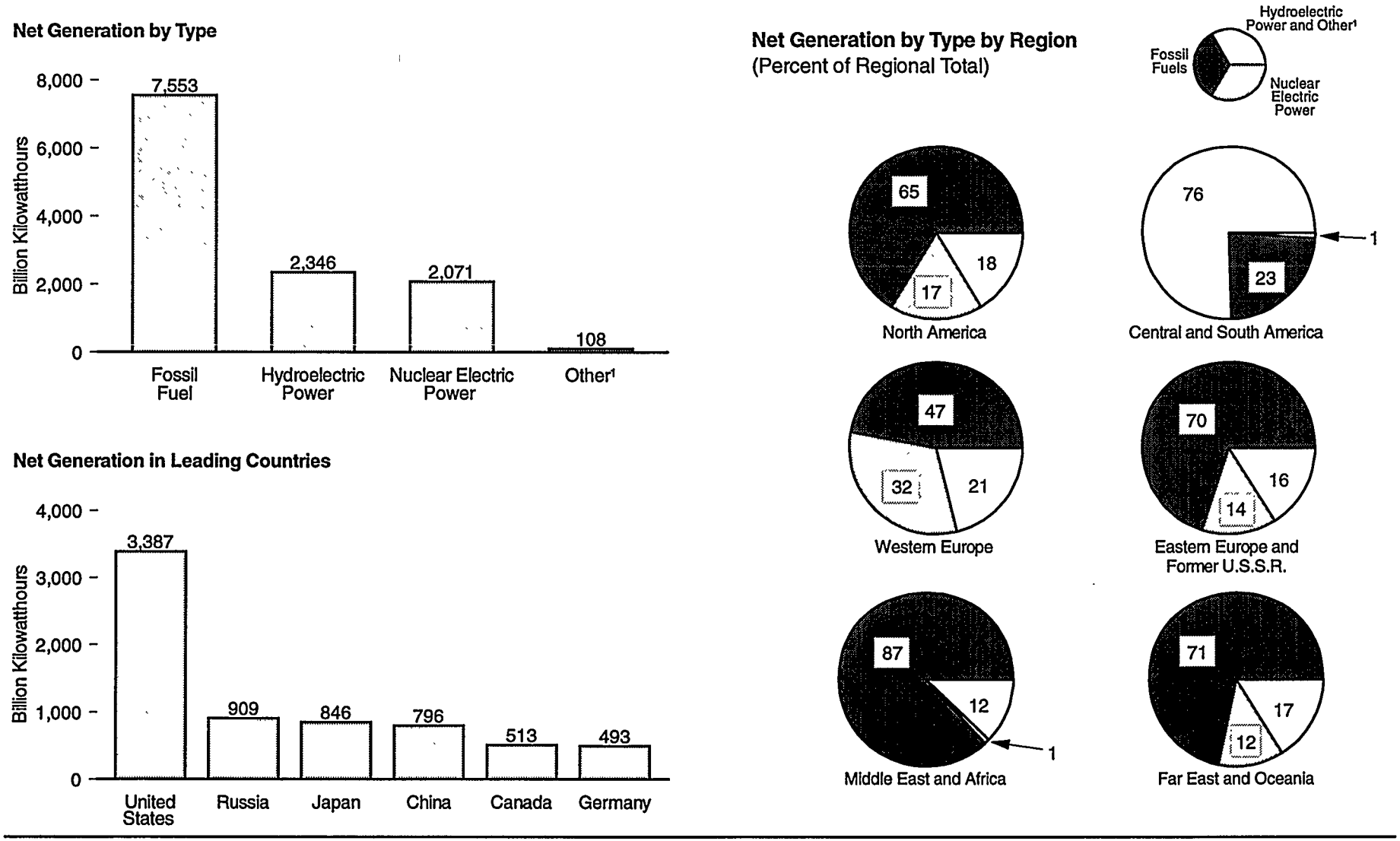
[1] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.

P=Preliminary data. — = Not applicable.

Notes: • Most data in this table are revised, because the methodology to calculate apparent consumption of coal was modified. • Totals may not equal sum of components due to independent rounding and the inclusion of more recent U.S. data from an alternative source.

Sources: **United States:** Table 7.1. **All Other Data:** Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.17 World Net Generation of Electricity, 1993



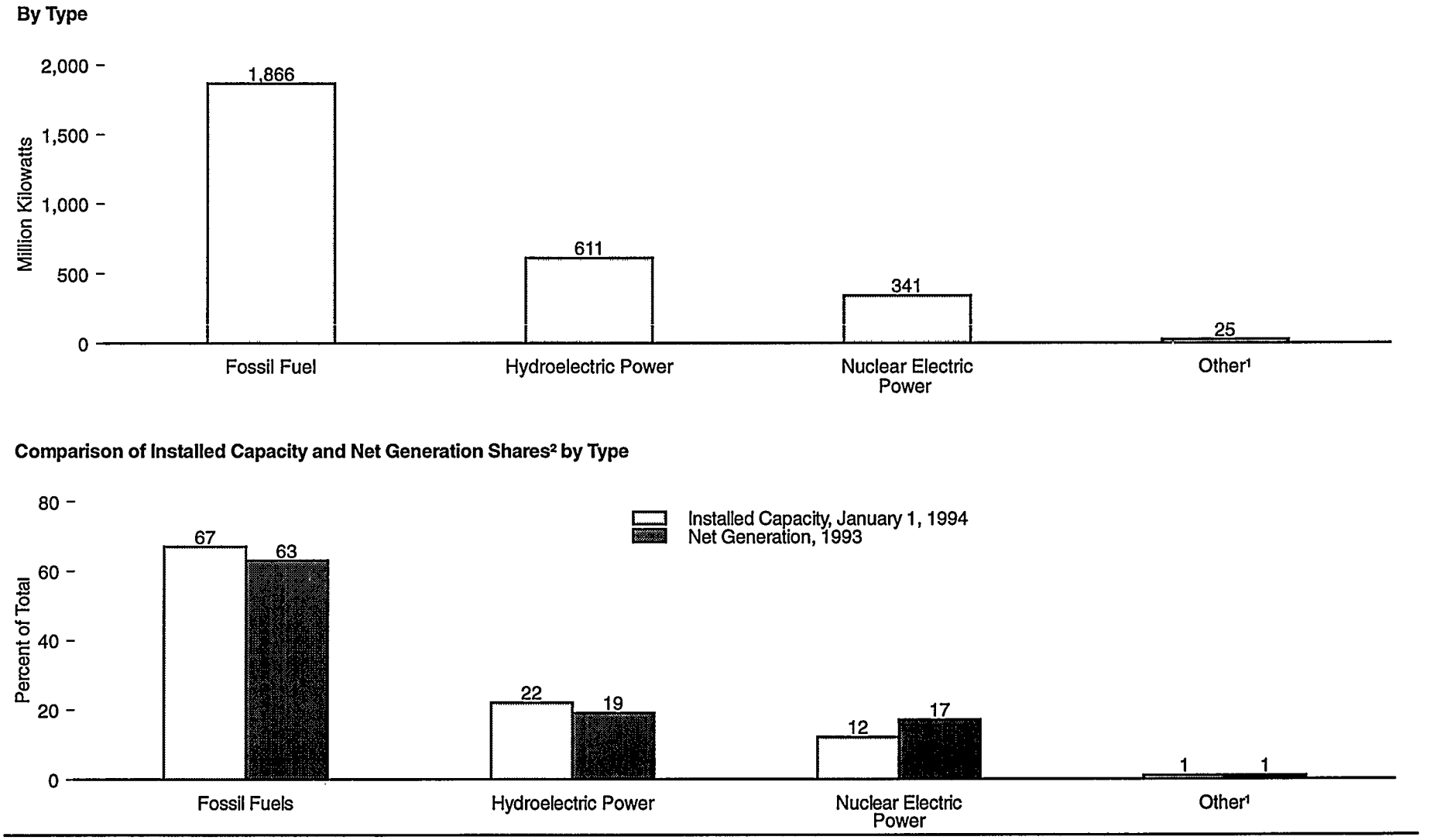

¹ Geothermal, biomass, wind, photovoltaic, and solar thermal generation.
Notes: • Data include both electric utility and non-electric utility sources.
• Because vertical scales differ, graphs should not be compared.
Source: Table 11.17.

# Table 11.17 World Net Generation of Electricity by Type, 1993
(Billion Kilowatthours)

| Region and Country | Fossil Fuel | Nuclear Electric Power | Hydro-electric Power | Other [1] | Total |
|---|---|---|---|---|---|
| **North America** | **2,615.0** | **703.7** | **634.3** | **81.4** | **4,034.4** |
| Canada | 103.6 | 88.6 | 320.3 | (s) | 512.6 |
| Mexico | 97.5 | 4.7 | 26.0 | 5.6 | 133.8 |
| United States | 2,413.2 | 610.4 | 287.9 | 75.8 | 3,387.2 |
| Other | 0.8 | 0.0 | 0.0 | 0.0 | 0.8 |
| **Central and South America** | **129.9** | **7.7** | **420.4** | **7.9** | **565.9** |
| Argentina | 29.3 | 7.3 | 23.9 | 0.0 | 60.5 |
| Brazil | 8.3 | (s) | 232.4 | 7.0 | 248.1 |
| Colombia | 11.6 | 0.0 | 27.7 | 0.0 | 39.3 |
| Venezuela | 22.5 | 0.0 | 47.0 | 0.0 | 69.5 |
| Other | 58.3 | 0.0 | 89.4 | 0.9 | 148.5 |
| **Western Europe** | **1,140.5** | **777.4** | **499.0** | **7.5** | **2,424.4** |
| Belgium | 26.2 | 39.5 | (s) | (s) | 66.0 |
| Finland | 26.0 | 18.9 | 13.5 | 0.0 | 58.4 |
| France | 33.2 | 350.2 | 63.1 | 0.5 | 447.1 |
| Germany | 329.5 | 145.8 | 17.5 | (s) | 493.0 |
| Italy | 164.2 | 0.0 | 41.0 | 3.8 | 209.0 |
| Netherlands | 68.4 | 3.8 | (s) | (s) | 72.4 |
| Norway | 0.5 | 0.0 | 117.8 | (s) | 118.3 |
| Spain | 70.2 | 53.7 | 24.1 | 0.0 | 148.0 |
| Sweden | 8.6 | 58.7 | 73.9 | (s) | 141.2 |
| Switzerland | 1.0 | 22.2 | 35.4 | (s) | 58.6 |
| Turkey | 37.4 | 0.0 | 33.6 | (s) | 71.1 |
| United Kingdom | 216.1 | 81.0 | 4.2 | 1.5 | 302.8 |
| Other | 159.1 | 3.8 | 74.5 | 1.3 | 238.6 |
| **Eastern Europe and Former U.S.S.R.** | **1,202.5** | **246.0** | **266.7** | **(s)** | **1,715.3** |
| Czech Republic | 42.0 | 12.5 | 1.6 | 0.0 | 56.1 |
| Kazakstan | 65.6 | (s) | 7.6 | 0.0 | 73.6 |
| Poland | 122.5 | 0.0 | 3.5 | 0.0 | 126.0 |
| Russia | 622.5 | 113.2 | 173.4 | (s) | 909.2 |
| Ukraine | 134.8 | 70.2 | 11.1 | 0.0 | 216.2 |
| Other | 215.2 | 49.6 | 69.5 | 0.0 | 334.3 |
| **Middle East** | **232.5** | **0.0** | **18.5** | **(s)** | **251.1** |
| Iran | 57.3 | 0.0 | 10.9 | 0.0 | 68.2 |
| Saudi Arabia | 59.5 | 0.0 | 0.0 | 0.0 | 59.5 |
| Other | 115.7 | 0.0 | 7.6 | (s) | 123.3 |
| **Africa** | **253.7** | **7.3** | **49.7** | **(s)** | **311.0** |
| Egypt | 36.6 | 0.0 | 8.4 | 0.0 | 45.0 |
| South Africa | 145.5 | 7.3 | (s) | 0.0 | 152.9 |
| Other | 71.6 | 0.0 | 41.1 | (s) | 113.0 |
| **Far East and Oceania** | **1,978.6** | **329.3** | **456.9** | **10.9** | **2,775.7** |
| Australia | 138.4 | 0.0 | 16.0 | 0.0 | 154.3 |
| China | 644.6 | 2.5 | 149.2 | 0.0 | 796.2 |
| India | 262.3 | 5.9 | 70.0 | (s) | 338.2 |
| Indonesia | 43.0 | 0.0 | 12.0 | 1.0 | 56.0 |
| Japan | 513.8 | 234.0 | 96.8 | 1.7 | 846.3 |
| South Korea | 75.5 | 55.2 | 5.9 | 0.0 | 136.7 |
| Taiwan | 70.1 | 31.3 | 6.8 | 0.0 | 108.3 |
| Thailand | 58.8 | 0.0 | 3.7 | 0.0 | 62.5 |
| Other | 172.1 | (s) | 96.6 | 8.1 | 277.2 |
| **World** | **7,552.8** | **2,071.4** | **2,345.5** | **108.1** | **12,077.7** |

[1] Geothermal, biomass, wind, photovoltaic, and solar thermal generation.
(s)=Less than 0.5 billion kilowatthours.
Notes: • Data include both electric utility and non-electric utility sources. • Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

## Figure 11.18 World Electrical Installed Capacity by Type, January 1, 1994




[1] Geothermal, biomass, wind, photovoltaic, and solar thermal sources.
[2] Sum of components may not equal 100 percent due to independent rounding.

Note: Data include both electric utility and non-electric utility sources.
Sources: Tables 11.17 and 11.18.

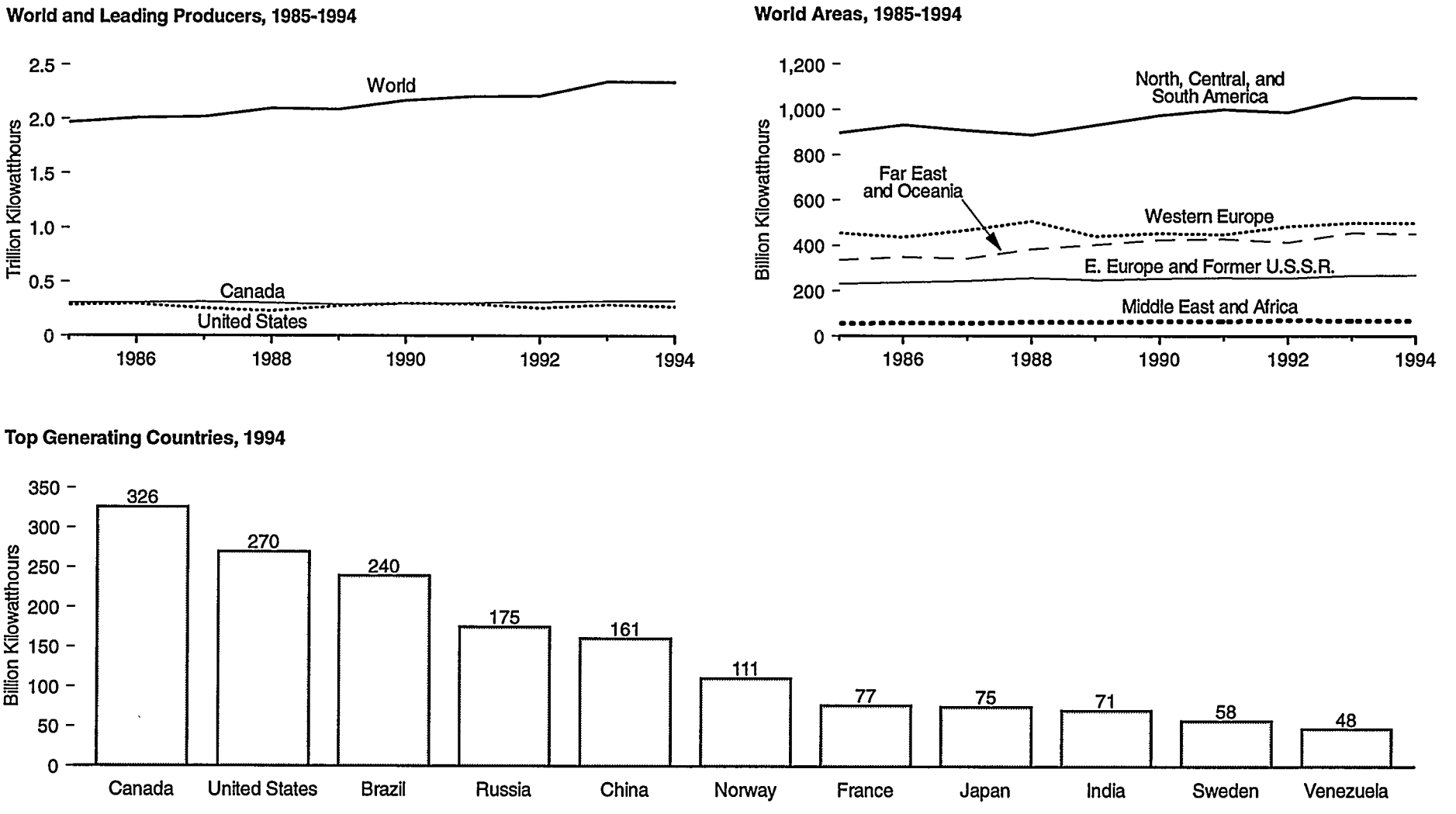
# Table 11.18 World Electrical Installed Capacity by Type, January 1, 1994

(Million Kilowatts)

| Region and Country | Fossil Fuel | Nuclear Electric Power | Hydroelectric Power[1] | Other[2] | Total |
|---|---|---|---|---|---|
| **North America** | **599.0** | **115.2** | **146.8** | **16.4** | **877.4** |
| Canada | 33.0 | 15.5 | 61.2 | (s) | 109.7 |
| Mexico | 23.8 | 0.7 | 8.2 | 0.7 | 33.3 |
| United States | [3] 541.6 | [3] 99.0 | [3] 77.4 | [3] 15.6 | [3] 733.6 |
| Other | 0.7 | 0.0 | 0.0 | (s) | 0.7 |
| **Central and South America** | **43.4** | **1.7** | **92.3** | **4.8** | **142.3** |
| Argentina | 10.0 | 1.0 | 7.0 | 0.0 | 18.0 |
| Brazil | 2.1 | 0.7 | 48.6 | 4.7 | 56.0 |
| Colombia | 2.6 | 0.0 | 7.7 | 0.0 | 10.4 |
| Venezuela | 8.1 | 0.0 | 10.7 | 0.0 | 18.8 |
| Other | 20.6 | 0.0 | 18.3 | (s) | 39.1 |
| **Western Europe** | **319.1** | **122.6** | **140.8** | **1.7** | **584.1** |
| Austria | 6.1 | 0.0 | 11.2 | 0.0 | 17.3 |
| Finland | 9.0 | 2.4 | 2.7 | 0.0 | 14.1 |
| France | 23.5 | 59.0 | 20.6 | (s) | 103.4 |
| Germany | 82.8 | 22.7 | 3.0 | (s) | 108.6 |
| Italy | 43.3 | 0.0 | 12.8 | 0.5 | 56.6 |
| Netherlands | 16.9 | 0.5 | (s) | (s) | 17.6 |
| Norway | (s) | 0.0 | 26.0 | 0.0 | 26.3 |
| Spain | 20.4 | 7.0 | 11.5 | (s) | 39.0 |
| Sweden | 8.8 | 10.0 | 16.0 | (s) | 34.8 |
| Switzerland | 0.8 | 3.0 | 10.0 | (s) | 13.8 |
| Turkey | 10.6 | 0.0 | 9.7 | (s) | 20.3 |
| United Kingdom | 52.3 | 11.9 | 1.4 | (s) | 65.7 |
| Other | 44.2 | 6.1 | 15.8 | 0.6 | 66.7 |
| **Eastern Europe and Former U.S.S.R.** | **313.0** | **45.4** | **83.1** | **(s)** | **441.5** |
| Czech Republic | 11.1 | 1.8 | 1.4 | 0.0 | 14.2 |
| Kazakstan | 12.4 | (s) | 3.5 | 0.0 | 16.3 |
| Poland | 27.1 | 0.0 | 2.0 | 0.0 | 29.2 |
| Romania | 16.4 | 0.0 | 5.9 | (s) | 22.3 |
| Russia | 148.7 | 21.2 | 43.4 | (s) | 213.4 |
| Ukraine | 36.7 | 12.9 | 4.7 | 0.0 | 54.3 |
| Other | 60.5 | 9.1 | 22.2 | (s) | 91.8 |
| **Middle East** | **70.1** | **0.0** | **4.0** | **(s)** | **74.2** |
| Iran | 18.9 | 0.0 | 2.0 | 0.0 | 20.9 |
| Saudi Arabia | 18.4 | 0.0 | 0.0 | 0.0 | 18.4 |
| Other | 32.8 | 0.0 | 2.1 | (s) | 34.8 |
| **Africa** | **56.1** | **1.9** | **19.0** | **(s)** | **77.2** |
| Egypt | 9.0 | 0.0 | 2.8 | 0.0 | 11.8 |
| South Africa | 24.0 | 1.9 | 0.6 | 0.0 | 26.5 |
| Other | 23.1 | 0.0 | 15.7 | (s) | 38.9 |
| **Far East and Oceania** | **465.7** | **54.7** | **124.6** | **1.7** | **646.7** |
| Australia | 29.8 | 0.0 | 6.9 | (s) | 36.7 |
| China | 137.1 | 1.2 | 44.6 | 0.0 | 182.9 |
| India | 62.3 | 2.1 | 19.6 | (s) | 84.0 |
| Indonesia | 12.5 | 0.0 | 3.3 | (s) | 15.9 |
| Japan | 134.1 | 38.6 | 21.0 | (s) | 194.0 |
| South Korea | 20.4 | 7.6 | 2.5 | 0.0 | 30.5 |
| Taiwan | 13.9 | 5.1 | 2.6 | 0.0 | 21.7 |
| Thailand | 11.4 | 0.0 | 2.5 | 0.0 | 13.9 |
| Other | 44.2 | (s) | 21.7 | 1.2 | 67.2 |
| **World** | **1,866.4** | **341.4** | **610.7** | **24.7** | **2,843.2** |

[1] Excludes pumped storage.
[2] Geothermal, biomass, wind, photovoltaic, and solar thermal capacity.
[3] Net summer capability.
(s)=Less than 0.5 million kilowatts.
Notes: • Data include both electric utility and nonutility sources. • Totals may not equal sum of components due to independent rounding.
Sources: Energy Information Administration (EIA), Office of Energy Markets and End Use, International Database, June 1996, except U.S. capacity, which is net summer capability at electric utilities from EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 1, and at nonutilities from Table 8.2 in this report.

# Figure 11.19 World Hydroelectric Power Net Generation




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 11.19.

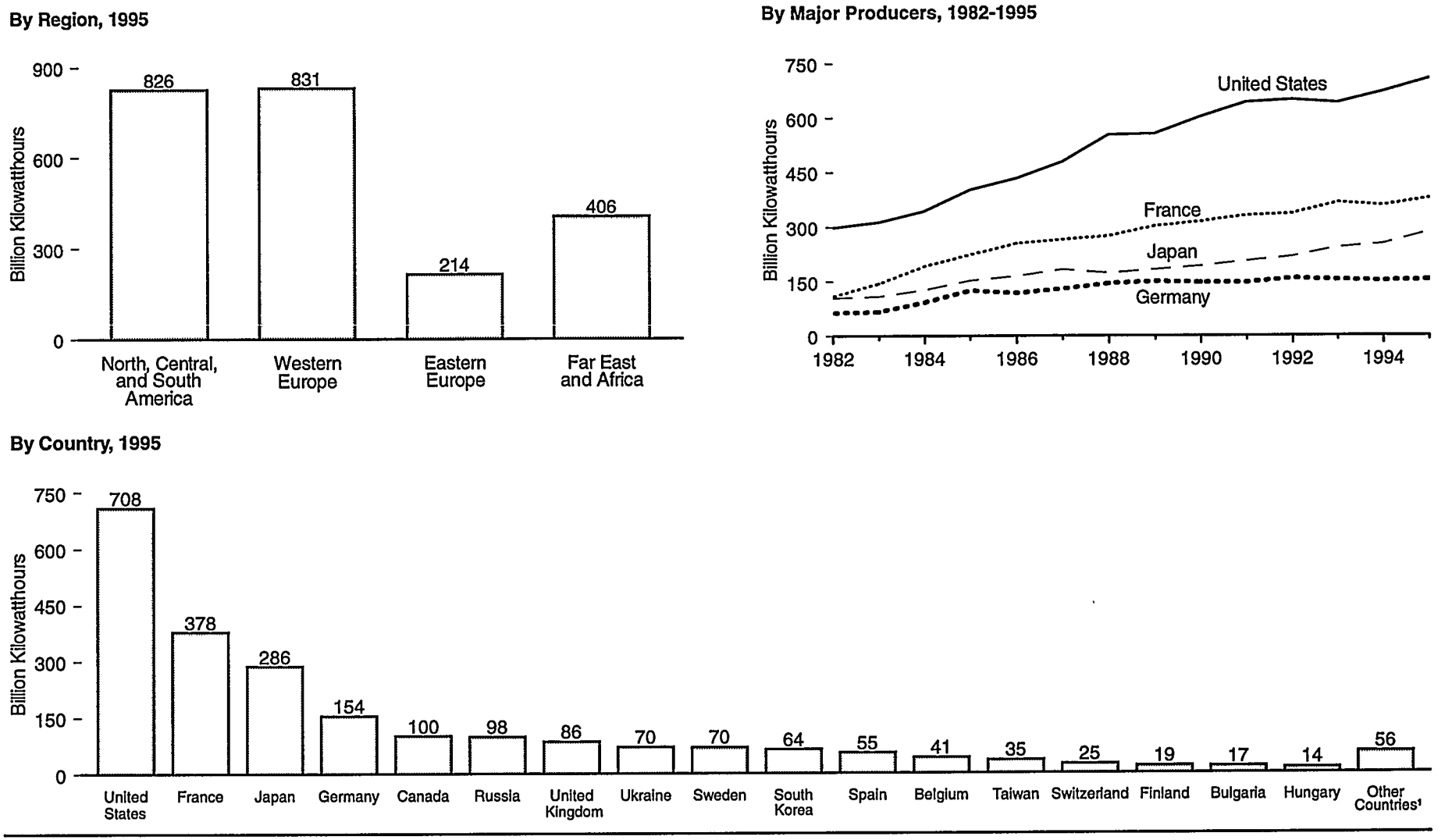
# Table 11.19 World Hydroelectric Power Net Generation, 1985-1994

(Billion Kilowatthours)

| Region and Country | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994[P] |
|---|---|---|---|---|---|---|---|---|---|---|
| **North, Central, and South America** | **897** | **931** | **907** | **887** | [R]932 | [R]975 | [R]1,001 | [R]988 | [R]1,055 | **1,051** |
| Argentina | 20 | 21 | 22 | 16 | 13 | 18 | 16 | 19 | [R]24 | 25 |
| Brazil | 177 | 181 | 184 | 197 | 203 | 205 | 216 | 221 | [R]232 | 240 |
| Canada | 301 | 308 | 313 | 303 | 288 | 293 | 304 | [R]313 | [R]320 | 326 |
| Chile | 10 | 11 | 12 | 11 | 10 | 12 | 13 | [R]17 | [R]17 | 18 |
| Colombia | 22 | 25 | 21 | 24 | 26 | 27 | 27 | 22 | [R]28 | 28 |
| Mexico | 26 | 20 | 18 | 21 | 24 | 24 | 22 | [R]26 | [R]26 | 20 |
| Paraguay | 4 | 12 | 18 | 20 | 24 | 27 | 29 | 27 | 31 | 35 |
| Peru | 9 | 10 | 11 | 10 | 10 | 10 | 11 | 10 | [R]11 | 12 |
| United States[1] | 284 | 294 | 253 | 226 | [R]276 | [R]296 | [R]291 | [R]258 | [R]288 | 270 |
| Venezuela | 22 | 25 | 31 | 34 | 34 | 37 | 44 | 47 | [R]47 | 48 |
| Other | [R]22 | [R]24 | [R]24 | [R]24 | [R]24 | [R]27 | [R]26 | [R]28 | [R]30 | 31 |
| **Western Europe** | **453** | **437** | **467** | **508** | **440** | **453** | **450** | [R]484 | [R]499 | **499** |
| Austria | 30 | 30 | 25 | 35 | 35 | 31 | 31 | 34 | [R]36 | 35 |
| Finland | 12 | 12 | 14 | 13 | 13 | 11 | 13 | 15 | 13 | 12 |
| France | 60 | 61 | 69 | 74 | 46 | 53 | 56 | 67 | 63 | 77 |
| Germany[2] | 17 | 18 | 20 | 20 | 18 | 17 | 15 | 17 | 18 | 19 |
| Italy | 41 | 41 | 39 | 40 | 34 | 31 | 42 | 42 | 41 | 44 |
| Norway | 101 | 95 | 102 | 108 | 117 | 120 | 109 | 116 | 118 | 111 |
| Serbia and Montenegro | — | — | — | — | — | — | — | 11 | 10 | 11 |
| Spain | 31 | 26 | 27 | 35 | 19 | 25 | 27 | 19 | 24 | 27 |
| Sweden | 70 | 60 | 71 | 69 | 71 | 72 | [R]63 | 74 | [R]74 | 58 |
| Switzerland | 32 | 33 | 34 | 35 | 29 | 30 | 32 | 32 | 35 | 39 |
| Turkey | 12 | 12 | 18 | 28 | 18 | 23 | 22 | 26 | 34 | 30 |
| Other | [R]47 | [R]49 | [R]47 | [R]50 | [R]41 | [R]41 | [R]41 | [R]30 | [R]33 | 36 |
| **Eastern Europe and Former U.S.S.R.** | **231** | **238** | **244** | **257** | **248** | **254** | **259** | [R]256 | [R]267 | **269** |
| Romania | 12 | 11 | 11 | 13 | 12 | 11 | 14 | 12 | 13 | 13 |
| Russia | — | — | — | — | — | — | — | [R]171 | 173 | 175 |
| Former U.S.S.R. | 205 | 213 | 217 | 229 | 221 | 231 | 233 | — | — | — |
| Other | 14 | 14 | 16 | 15 | 15 | 12 | 13 | [R]73 | [R]81 | 80 |
| **Middle East and Africa** | **56** | [R]58 | [R]58 | [R]63 | [R]63 | 66 | [R]67 | [R]70 | 68 | 68 |
| Egypt | 8 | 8 | 8 | 8 | 8 | 10 | [R]9 | [R]8 | [R]8 | 8 |
| Zambia | 10 | 10 | 8 | 8 | 7 | 8 | 8 | 8 | 8 | 8 |
| Other | 38 | [R]40 | [R]41 | [R]46 | [R]48 | [R]49 | [R]51 | [R]53 | [R]52 | 52 |
| **Far East and Oceania** | **336** | [R]349 | [R]343 | **384** | **404** | [R]425 | [R]431 | [R]415 | [R]457 | **452** |
| Australia | 14 | 14 | 13 | 13 | 14 | 14 | 16 | 15 | 16 | 16 |
| China | [R]91 | 94 | [R]99 | 108 | 117 | 125 | 124 | [R]130 | [R]149 | 161 |
| India | 51 | 53 | 47 | 57 | 62 | 71 | 72 | 69 | [R]70 | 71 |
| Indonesia | 6 | 7 | 8 | 8 | 9 | 10 | 10 | 13 | 12 | 12 |
| Japan | 82 | 80 | 74 | 90 | 91 | 88 | 97 | 82 | [R]97 | 75 |
| Korea, North | 28 | 29 | 29 | 31 | 31 | 31 | 31 | [R]24 | [R]24 | 24 |
| New Zealand | 20 | 22 | 22 | 23 | 22 | 23 | 23 | 20 | [R]23 | 26 |
| Pakistan | 12 | 14 | 15 | 17 | 17 | 17 | 18 | 20 | [R]21 | 21 |
| Other | [R]32 | [R]36 | [R]36 | [R]36 | [R]42 | [R]45 | [R]41 | [R]42 | [R]45 | 45 |
| **World** | [R]1,972 | **2,012** | **2,019** | [R]2,099 | [R]2,088 | [R]2,173 | [R]2,209 | [R]2,212 | [R]2,345 | **2,340** |

[1] Electric utility and industrial hydroelectric power.
[2] Through 1990, this is East and West Germany. Beginning in 1991, this is unified Germany.
R=Revised data. P=Preliminary data. — = Not applicable.
Notes: • See Note 3 at end of section. • Generation data consist of both utility and non-utility sources.
• Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, Office of Energy Markets and End Use, International Database, June 1996.

# Figure 11.20 World Nuclear Electricity Gross Generation




[1] "Other countries" are Argentina, Brazil, Mexico, Netherlands, Lithuania, Romania, Slovenia, India, Pakistan, and South Africa.

Note: Because vertical scales differ, graphs should not be compared.
Source: Table 11.20.

# Table 11.20 World Nuclear Electricity Gross Generation, 1982-1995

(Billion Kilowatthours)

| Region and Country | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **North, Central, and South America** | **343.1** | **370.2** | **404.1** | **474.8** | **514.6** | **566.3** | **645.2** | **646.9** | **690.7** | **742.6** | **744.0** | **752.7** | **795.5** | **825.6** |
| Argentina | 1.9 | 3.4 | 4.5 | 5.8 | 5.7 | 5.2 | 5.1 | 5.0 | 7.4 | 7.7 | 7.1 | 7.7 | 8.2 | 7.1 |
| Brazil | 0.1 | 0.2 | 2.1 | 3.4 | 0.1 | 1.0 | 0.3 | 1.6 | 2.0 | 1.4 | 1.8 | 0.4 | 0.0 | 2.5 |
| Canada | 42.6 | 53.0 | 53.8 | 62.9 | 74.6 | 80.6 | 85.6 | 83.2 | 75.8 | 86.1 | 81.3 | 97.6 | 110.7 | 100.4 |
| Mexico | — | — | — | — | — | — | — | — | — | 4.2 | 3.9 | 4.9 | 4.2 | 7.9 |
| United States [1] | 298.6 | 313.6 | 343.8 | 402.7 | 434.1 | 479.5 | 554.1 | 557.0 | 603.4 | 643.0 | 650.0 | 642.0 | 672.4 | 707.7 |
| **Western Europe** | **321.8** | **377.2** | **485.4** | **582.8** | **631.5** | **648.3** | **688.1** | **732.0** | **738.6** | **769.7** | **783.9** | **817.0** | **815.5** | **830.9** |
| Belgium | 15.6 | 24.1 | 27.7 | 34.5 | 38.6 | 41.9 | 43.1 | 41.2 | 42.7 | 42.9 | 43.5 | 41.9 | 40.6 | 41.4 |
| Finland | 16.5 | 17.4 | 18.5 | 18.8 | 18.8 | 19.4 | 19.3 | 18.8 | 18.9 | 19.2 | 19.0 | 19.6 | 19.1 | 18.9 |
| France | 108.9 | 144.2 | 191.2 | 224.0 | 254.3 | 265.5 | 274.9 | 302.5 | 314.1 | 331.4 | 337.6 | 366.7 | 359.1 | 377.6 |
| Germany [2] | 63.4 | 65.8 | 92.6 | 125.8 | 118.9 | 130.2 | 145.2 | 149.5 | 147.2 | 147.3 | 158.8 | 153.5 | 151.1 | 154.3 |
| Italy [3] | 6.8 | 5.8 | 6.9 | 7.0 | 8.7 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Netherlands | 3.9 | 3.6 | 3.8 | 3.9 | 4.2 | 3.6 | 3.7 | 4.0 | 3.4 | 3.3 | 3.8 | 3.9 | 4.0 | 4.0 |
| Spain | 8.8 | 10.7 | 23.1 | 28.0 | 37.5 | 41.3 | 50.4 | 56.1 | 54.3 | 55.6 | 55.8 | 56.1 | 55.1 | 54.5 |
| Sweden | 38.8 | 40.4 | 51.3 | 58.6 | 69.9 | 67.2 | 69.4 | 65.6 | 68.2 | 76.8 | 63.5 | 61.4 | 72.8 | 69.9 |
| Switzerland | 15.0 | 15.5 | 16.3 | 22.4 | 22.5 | 23.0 | 22.7 | 22.8 | 23.6 | 22.9 | 23.4 | 23.3 | 24.2 | 24.8 |
| United Kingdom | 44.1 | 49.6 | 54.1 | 59.7 | 58.2 | 56.2 | 59.4 | 71.6 | 66.1 | 70.4 | 78.5 | 90.4 | 89.5 | 85.5 |
| **Eastern Europe [4]** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **271.5** | **263.0** | R,E232.4 | **214.4** |
| Bulgaria | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 12.2 | 14.0 | R14.9 | 17.2 |
| Czech Republic | — | — | — | — | NA | NA | NA | NA | NA | NA | 12.9 | 13.2 | R,E12.7 | NA |
| Hungary | — | — | NA | NA | NA | NA | NA | NA | NA | NA | 13.8 | 13.8 | 14.0 | 14.0 |
| Kazakstan | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.5 | 0.4 | R,E0.4 | NA |
| Lithuania | — | — | — | — | NA | NA | NA | NA | NA | NA | 16.4 | 12.9 | R,E7.0 | [5]9.7 |
| Romania [6] | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.0 |
| Russia | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 125.6 | 120.4 | 97.7 | 98.3 |
| Slovakia | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 11.7 | 11.6 | R12.7 | NA |
| Slovenia | — | — | NA | NA | NA | NA | NA | NA | NA | NA | 4.0 | 4.0 | 4.6 | 4.8 |
| Ukraine | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 74.6 | 72.7 | 68.4 | 70.4 |
| **Far East and Africa** | **123.6** | **140.1** | **171.9** | **207.9** | **232.9** | **266.1** | **259.6** | **275.2** | **293.2** | **313.0** | **325.1** | **353.0** | R,E377.0 | **405.9** |
| China | — | — | — | — | — | — | — | — | — | — | — | E2.6 | R,E14.2 | NA |
| India | 2.2 | 2.9 | 4.1 | 4.5 | 5.1 | 5.5 | 6.1 | 4.0 | 6.3 | 5.4 | 6.3 | 6.2 | 5.0 | 8.0 |
| Japan | 104.5 | 109.1 | 127.2 | 152.0 | 164.8 | 182.8 | 173.6 | 183.7 | 191.9 | 205.8 | 218.0 | 243.5 | 253.8 | 286.1 |
| Pakistan | 0.1 | 0.2 | 0.3 | 0.3 | 0.5 | 0.3 | 0.2 | 0.1 | 0.4 | 0.4 | 0.6 | 0.4 | 0.6 | 0.5 |
| South Africa | — | — | — | 5.9 | 9.3 | 6.6 | 11.1 | 11.7 | 8.9 | 9.7 | 9.9 | 7.7 | 10.3 | 11.9 |
| South Korea | 3.8 | 9.0 | 11.8 | 16.5 | 26.1 | 37.8 | 38.7 | 47.4 | 52.8 | 56.3 | 56.4 | 58.1 | 58.3 | 64.0 |
| Taiwan | 13.1 | 18.9 | 24.3 | 28.7 | 26.9 | 33.1 | 29.9 | 28.3 | 32.9 | 35.3 | 33.8 | 34.3 | 34.8 | 35.3 |
| **World [7]** | **788.5** | **887.5** | **1,061.5** | **1,265.4** | **1,378.9** | **1,480.8** | **1,592.8** | **1,654.2** | **1,722.5** | **1,825.2** | **2,124.5** | **2,185.6** | R2,220.4 | **2,276.8** |

[1] See Note 3 at end of section.
[2] Through 1990, the data for Germany are for the former West Germany only. Beginning in 1991, the data for Germany are for the unified Germany, i.e., the former East Germany and West Germany.
[3] In 1987, Italy's citizens voted for a nuclear power moratorium, which shut down their nuclear power plants indefinitely.
[4] The gross generation estimates for 1992 through 1995 for Eastern European countries are calculated as 5 percent more than the annual net nuclear generation reported by the International Atomic Energy Agency and published annually in *Nuclear Power Reactors in the World.*
[5] Covers March through December only.
[6] Romania has one nuclear generating unit, which is undergoing testing. Its commercial operation is projected to begin in 1996.
[7] Eastern European countries are included in the total figure beginning in 1992.
R=Revised data. E=Estimate. NA=Not available. — = Not applicable.
Note: Totals may not equal sum of components due to independent rounding.
Source: McGraw-Hill Publishing Co., Inc., *Nucleonics Week.*

## International Energy Notes

1. World primary energy production comprises crude oil (including lease condensate), natural gas plant liquids, dry natural gas, coal, net electricity from hydroelectric power and nuclear electric power, and net electricity generated for distribution from geothermal, wind, and solar thermal energy. Crude oil production is measured at the wellhead and includes lease condensate. Natural gas plant liquids are products obtained from processing natural gas at natural gas processing plants, including natural gas plants, cycling plants, and fractionators. Dry natural gas production is that amount of natural gas produced that is available to be marketed and consumed as a gas. Production of coal (anthracite, subanthracite, lignite, bituminous coal, subbituminous coal, and brown coal) is the sum of sales, mine consumption, issues to miners, and issues to coking, briquetting, and other ancillary plants at mines. Coal production data include quantities extracted from surface and underground workings and normally exclude wastes removed at mines or associated preparation plants. The data on production of electricity from hydroelectric power, nuclear electric power, and electricity generated for distribution from geothermal, wind, and solar thermal energy include data on both electric utility and industrial production reported on a net basis, thus excluding electricity that is generally used by the electric power plant for its own operating purposes or electricity losses in the transformers that are considered integral parts of the station.

2. Petroleum stocks reported by the Organization for Economic Cooperation and Development (OECD) include those held at (or in) the following locations or facilities: leases, refineries, natural gas processing plants, bulk terminals, tanks associated with pipelines, barges, intercoastal tankers, ocean tankers in port, inland ship bunkers, major final consumers, and the strategic storage reserve. For an individual country, stocks include those held for the account of that country but located in another country. U.S. stocks include those held in the 50 States and the District of Columbia. "Other OECD" includes stocks held in Puerto Rico and the Virgin Islands. The OECD definition of petroleum stocks excludes petroleum in pipelines, rail tank cars, tank trucks, oceangoing ship bunkers, service stations, retail stores, and tankers at sea. An exception is U.S. stocks, which include petroleum in pipelines.

3. Data on the generation of electricity in the United States represent net generation, which is gross output of electricity (measured at the generator terminals) minus power plant use. Nuclear electricity generation data identified by individual countries in Table 11.20 are gross output of electricity.

# 12. Environmental Indicators

## Emissions of Greenhouse Gases

Greenhouse gases—carbon dioxide, methane, nitrous oxide, carbon monoxide, and other gases—are those which block infrared radiation from Earth to space and reradiate the captured heat to the atmosphere. This warming effect, known as the greenhouse effect, keeps Earth's climate hospitable to plant, animal, and human life. But some scientists believe that anthropogenic (human-caused) additions to greenhouse gases will raise global average temperatures and produce deleterious changes in the global climate.

***Carbon dioxide.*** Anthropogenic emissions of carbon dioxide, which accounts for the largest share by far of all anthropogenic emissions of greenhouse gases, rose to 5.2 billion metric tons of gas in 1994, up from 4.7 billion metric tons in 1985 (12.1).* Energy-related carbon dioxide emissions—those produced by the burning of fossil fuels—totaled 1.4 billion metric tons of carbon in 1994 (12.2). (There is one metric ton of carbon in every 3.667 metric tons of carbon dioxide gas.) Consumption of petroleum, particularly motor gasoline, by the transportation sector and coal burning at electric utilities were the biggest sources of carbon dioxide emissions in 1994 (12.3).

***Methane.*** Energy-related activities also accounted for a big share of methane emissions (7.4 million metric tons of methane) in 1993 (12.4). But landfills emitted 10 million metric tons and agricultural sources (such as digestive processes in ruminant animals and the anaerobic decomposition of organic materials in animal waste and rice paddies) emitted 8.7 million metric tons of methane in 1993.

***Nitrous oxide.*** Emissions of nitrous oxide, which, molecule for molecule, has a warming potential greater than that of either carbon dioxide or methane, rose to 0.5 million metric tons of gas in 1993 (12.1).

***Criteria pollutants.*** The Clean Air Act of 1970 requires that air quality standards be established for pollutants that harm public health. Some criteria pollutants, such as carbon monoxide, nitrogen oxides, and nonmethane volatile organic compounds (VOC's), also influence atmospheric concentrations of greenhouse gases. In 1993, carbon monoxide and nonmethane VOC emissions were higher than in the previous year but lower than in 1985 (12.1). Emissions of nitrogen oxides were fairly stable over the 9-year period.

**Numbers in parentheses indicate related tables. Annual data are the most recent available; they frequently are preliminary and may be revised in future publications. Percentages and numbers in text are calculated by using data in the tables.*

## Emissions and Environmental Equipment at Electric Utilities

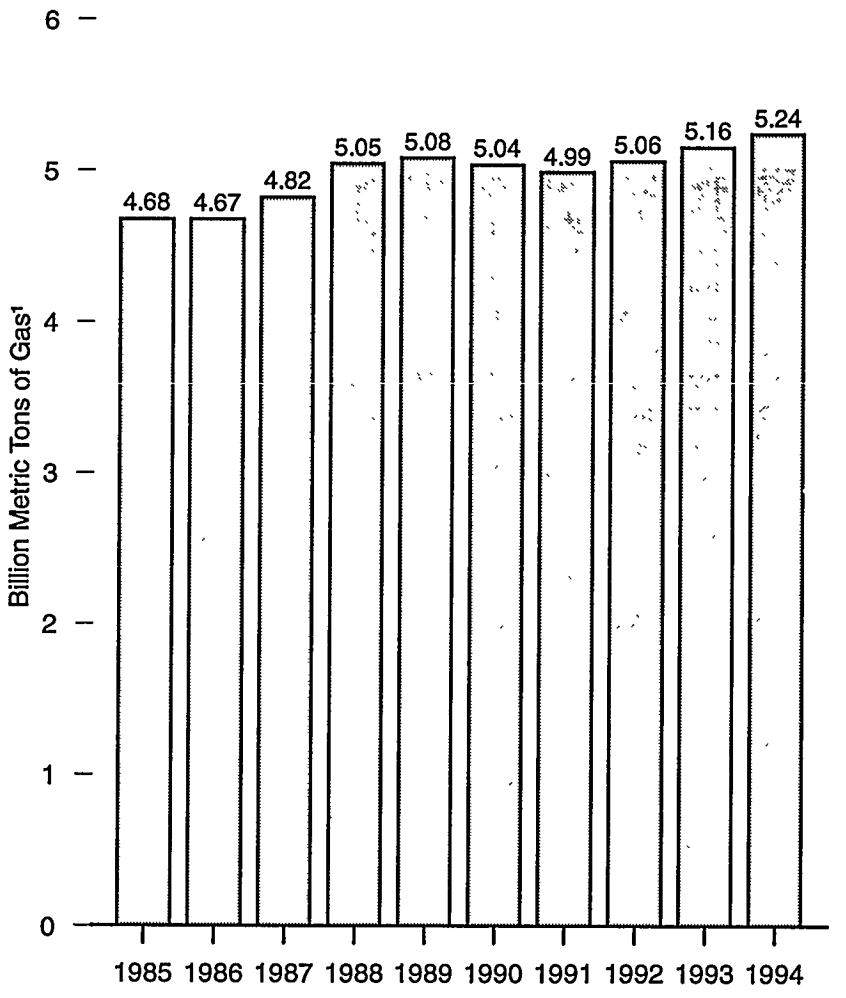
In general, changes in electric utility consumption of fossil fuels are accompanied by concomitant changes in the emission of carbon dioxide. In 1985 (the first year of the Energy Information Administration's electric utility emissions data series), consumption of fossil fuels to generate electricity totaled 19 quadrillion Btu (8.5). Emissions of carbon dioxide from fossil-fueled steam-electric generating units totaled 1.7 billion short tons (12.5). In 1994, consumption of fossil fuels to generate electricity rose to 21 quadrillion Btu, 11 percent higher than in 1985 (8.5), and carbon dioxide emissions from fossil-fueled steam-electric generating units were 13 percent higher than in 1985 (12.5).

***Some scientists believe that anthropogenic (human-caused) additions to greenhouse gases will produce deleterious changes in the global climate.***

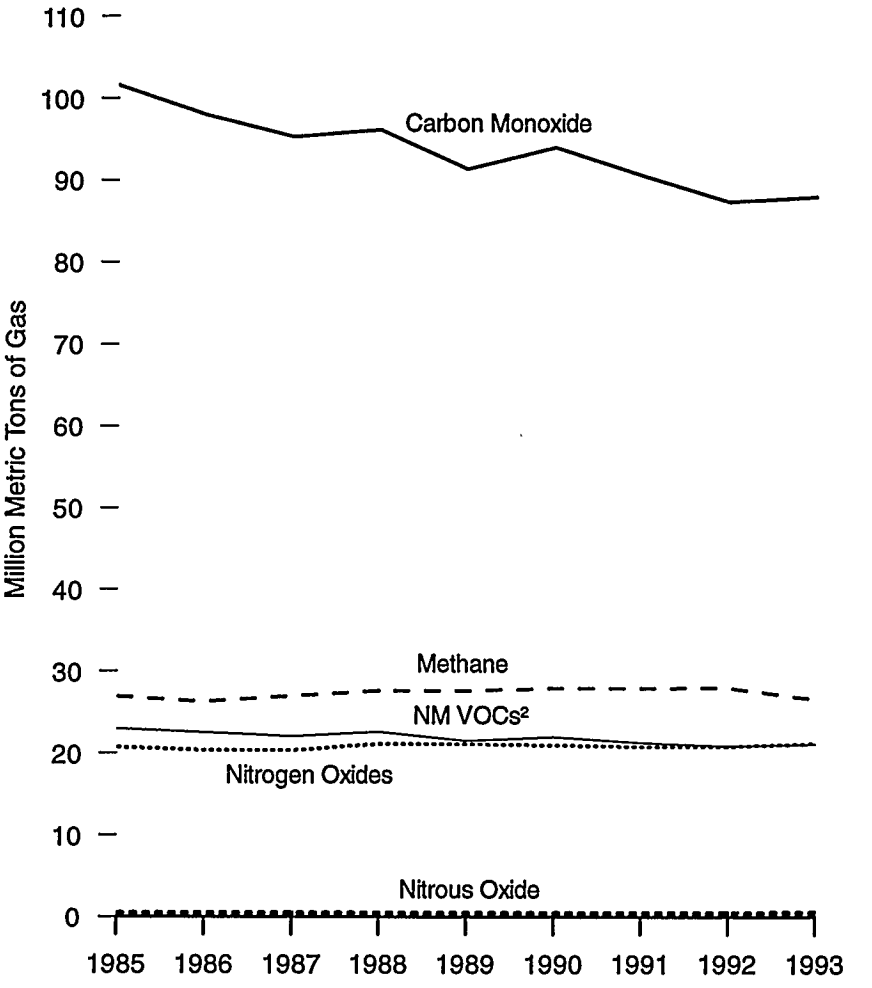
By contrast, emissions of sulfur dioxide were actually lower in 1994 than they were in 1985. As is true of carbon dioxide emissions, most emissions of sulfur dioxide were attributable to coal combustion. However, such sulfur dioxide emissions can be controlled through the use of coal with a lower sulfur content and the use of scrubbers. From 1985 through 1994, the amount of coal-fired capacity equipped with scrubbers increased 42 percent to 81 million kilowatts (12.6). Although the amount of electricity generated by burning coal at electric utilities rose 17 percent during the 1985-to-1994 period (8.3), coal-related sulfur dioxide emissions declined 15 percent (12.5).

## Figure 12.1 Estimated Emissions of Greenhouse Gases

### Carbon Dioxide, 1985-1994




### Other Greenhouse Gases, 1985-1993




[1] Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

[2] Nonmethane volatile organic compounds.

Source: Table 12.1.

# Table 12.1 Estimated Emissions of Greenhouse Gases by Gas, 1985-1994

(Million Metric Tons of Gas)

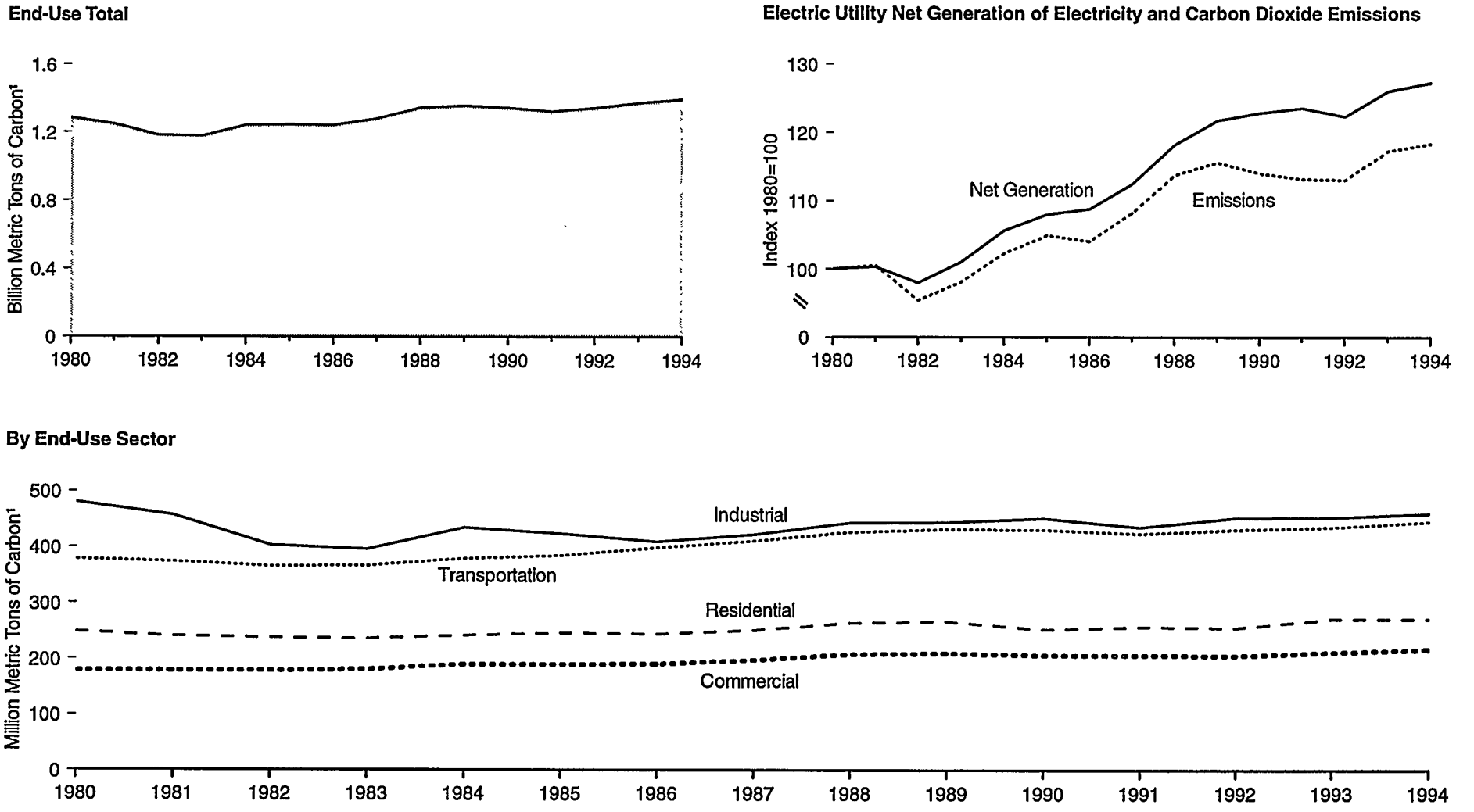
| Gas | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Carbon Dioxide**[1] | R4,677.5 | R4,674.0 | R4,820.6 | R5,046.1 | R5,080.7 | R5,035.5 | R4,988.1 | R5,062.9 | R5,156.0 | R5,243.4 |
| **Methane** | R26.9 | R26.3 | R27.0 | R27.6 | R27.6 | R27.9 | R27.9 | R28.0 | R26.6 | NA |
| **Nitrous Oxide** | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | R0.5 | NA |
| **Halocarbons and Minor Gases** | | | | | | | | | | |
| CFC[2]-11, CFC-12, CFC-113 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | R0.2 | R0.1 |
| HCFC[3]-22 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | R0.1 | R0.1 |
| HFC[4]-23 and PFCs[5] | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) | ([6]) |
| Methyl Chloroform | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | R0.2 | R0.1 |
| **Criteria Pollutants** | | | | | | | | | | |
| Carbon Monoxide | R101.6 | R98.0 | R95.3 | R96.2 | R91.4 | R94.1 | R90.6 | R87.4 | R88.1 | NA |
| Nitrogen Oxides | R20.7 | R20.3 | R20.3 | R21.1 | R21.1 | R21.0 | R20.8 | R20.8 | R21.2 | NA |
| Nonmethane VOCs[7] | R23.0 | R22.5 | R22.1 | R22.6 | R21.5 | R22.0 | R21.3 | R20.9 | R21.1 | NA |

[1] Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.
[2] Chlorofluorocarbons.
[3] Chlorodifluoromethane.
[4] Hydrofluorocarbons.
[5] Perfluorocarbons.
[6] Estimated HFC-23 and perfluorocarbon emissions combined totaled 5.5 thousand metric tons in 1985, and 6.4 thousand metric tons in 1994.
[7] Volatile organic compounds.

R=Revised data. NA=Not available.

Sources: • 1985 and 1986—Energy Information Administration (EIA), Office of Integrated Analysis and Forecasting estimates. • 1987 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1994*, October 1995, Table ES1.

# Figure 12.2 Carbon Dioxide Emissions From Fossil Energy Consumption by Sector, 1980-1994




[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

Sources: Tables 8.1 and 12.2.

# Table 12.2 Carbon Dioxide Emissions From Fossil Energy Consumption by Sector, 1980-1994

(Million Metric Tons of Carbon[1])

| Year | Residential | Commercial | Industrial | Transportation | End-Use Total | Electric Utilities [2] |
|---|---|---|---|---|---|---|
| 1980 | 248.4 | 178.3 | R480.5 | R378.1 | R1,285.2 | 418.3 |
| 1981 | R239.8 | 178.3 | R456.9 | R374.1 | R1,249.1 | 420.5 |
| 1982 | 237.6 | R178.1 | R403.7 | R365.6 | R1,185.0 | 399.3 |
| 1983 | R236.1 | 180.0 | R396.2 | R366.9 | R1,179.3 | 410.4 |
| 1984 | R241.1 | 188.8 | R434.4 | R379.0 | R1,243.4 | 427.9 |
| 1985 | 245.8 | 189.6 | R424.1 | R384.4 | R1,243.9 | 438.9 |
| 1986 | 244.0 | 190.4 | R409.0 | R399.1 | R1,242.5 | 435.4 |
| 1987 | 251.0 | 197.2 | R422.7 | R411.1 | R1,282.0 | 452.6 |
| 1988 | R264.8 | 207.6 | R444.1 | R427.5 | R1,344.0 | 475.9 |
| 1989 | 267.5 | 210.0 | R445.6 | R432.7 | R1,355.8 | 483.5 |
| 1990 | R253.0 | 206.7 | R452.4 | R432.1 | R1,344.2 | 476.9 |
| 1991 | R257.1 | 206.4 | R436.6 | R424.5 | R1,324.6 | 473.5 |
| 1992 | 255.9 | 205.5 | R453.6 | R431.4 | R1,346.3 | 472.9 |
| 1993 | 271.6 | 212.1 | 454.0 | 436.7 | 1,372.5 | 490.6 |
| 1994P | 271.6 | 216.9 | 461.4 | 446.3 | 1,396.2 | 494.9 |

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

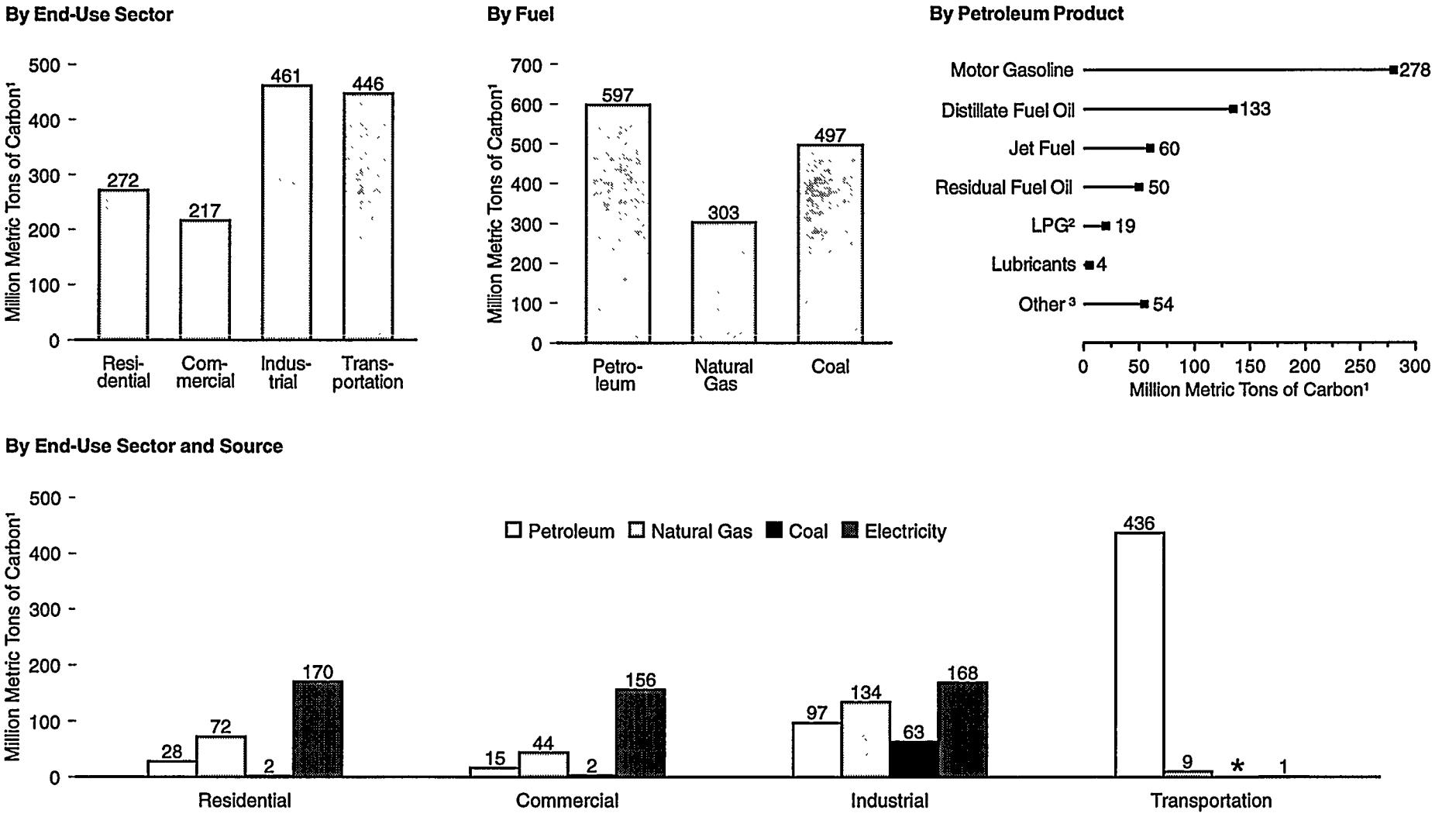
[2] Electric utility emissions are distributed across end-use sectors.

R=Revised data. P=Preliminary data.

Notes: • Includes energy from petroleum, natural gas, and coal. • Totals may not equal sum of components due to independent rounding.

Sources: • 1980 and 1981—Energy Information Administration (EIA), Office of Integated Analysis and Forecasting (OIAF) estimates. • 1982 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1994*, October 1995, Tables 5 and C1-C5, except 1980 to 1982, and 1986, which are OIAF estimates.

# Figure 12.3 Carbon Dioxide Emissions From Energy Use by Sector, 1994




[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

[2] Liquefied petroleum gases.

[3] "Other" includes aviation gasoline, kerosene, and other products.

* Included in the industrial sector.

Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.3.

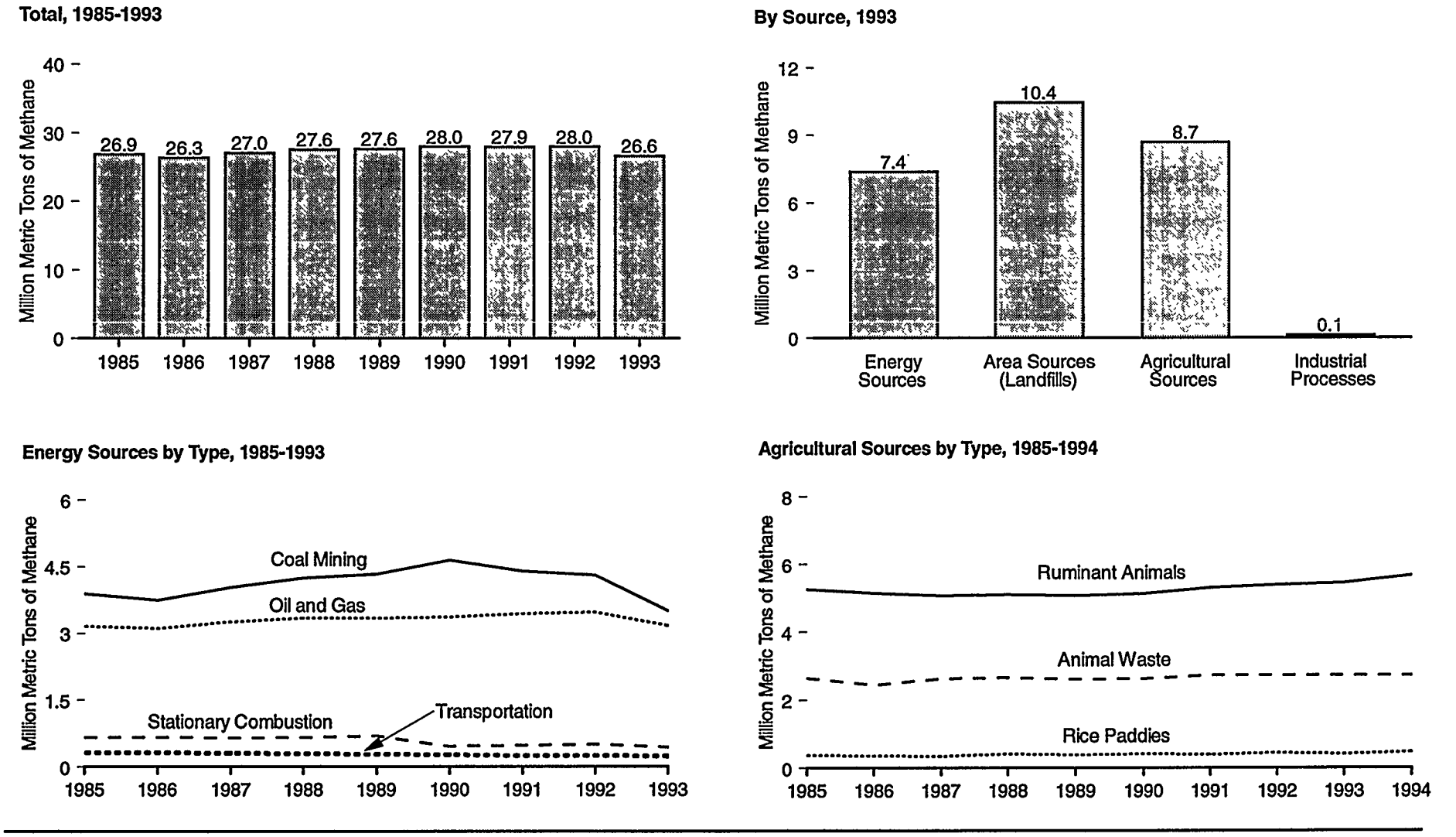
# Table 12.3 Carbon Dioxide Emissions From Energy Use by Sector, 1994

(Million Metric Tons of Carbon[1])

| Energy Source | Residential | Commercial | Industrial | Transportation | End-Use Total | Electric Utilities [2] | Total |
|---|---|---|---|---|---|---|---|
| Petroleum | 27.6 | 15.4 | 96.9 | 436.2 | 576.1 | 20.6 | 596.8 |
| Aviation Gasoline | — | — | — | 0.7 | 0.7 | — | 0.7 |
| Distillate Fuel | 18.8 | 9.5 | 22.3 | 80.3 | 130.9 | [3] 1.9 | 132.8 |
| Jet Fuel | — | — | — | 60.4 | 60.4 | — | 60.4 |
| Kerosene | 1.5 | 0.3 | 0.3 | — | 2.0 | — | 2.0 |
| Liquefied Petroleum Gases | 7.4 | 1.3 | 9.8 | 0.4 | 18.8 | — | 18.8 |
| Lubricants | — | — | 1.8 | 1.7 | 3.5 | — | 3.5 |
| Motor Gasoline | — | 0.6 | 3.5 | 273.5 | 277.6 | — | 277.6 |
| Residual Fuel | — | 3.8 | 8.9 | 19.2 | 31.8 | [4] 18.0 | 49.8 |
| Other | — | — | 50.4 | — | 50.4 | [5] 0.7 | 51.1 |
| Natural Gas | 72.1 | 43.6 | 133.5 | 9.4 | 258.7 | 44.0 | 302.6 |
| Coal | 1.5 | 2.2 | 62.8 | ([6]) | 66.4 | 430.4 | 496.8 |
| Electricity | 170.4 | 155.7 | 168.2 | 0.7 | 494.9 | — | — |
| Total | 271.6 | 216.9 | 461.4 | 446.3 | 1,396.2 | 494.9 | 1,396.2 |

[1] Tons of carbon can be converted to tons of carbon dioxide gas by multiplying by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.
[2] Electric utility emissions are distributed across end-use sectors. Electric utilities include independent power producers but exclude cogeneration facilities.
[3] Light fuel oil.
[4] Heavy fuel oil.
[5] Petroleum coke.
[6] Included in the industrial sector.
— = Not applicable.
Note: • Data are preliminary. • Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 1987-1994*, October 1995, Tables 4 and C1-C5 and unpublished estimates.

# Figure 12.4 Methane Emissions From Anthropogenic Sources




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.4.

# Table 12.4 Methane Emissions From Anthropogenic Sources, 1985-1994

(Million Metric Tons of Methane)

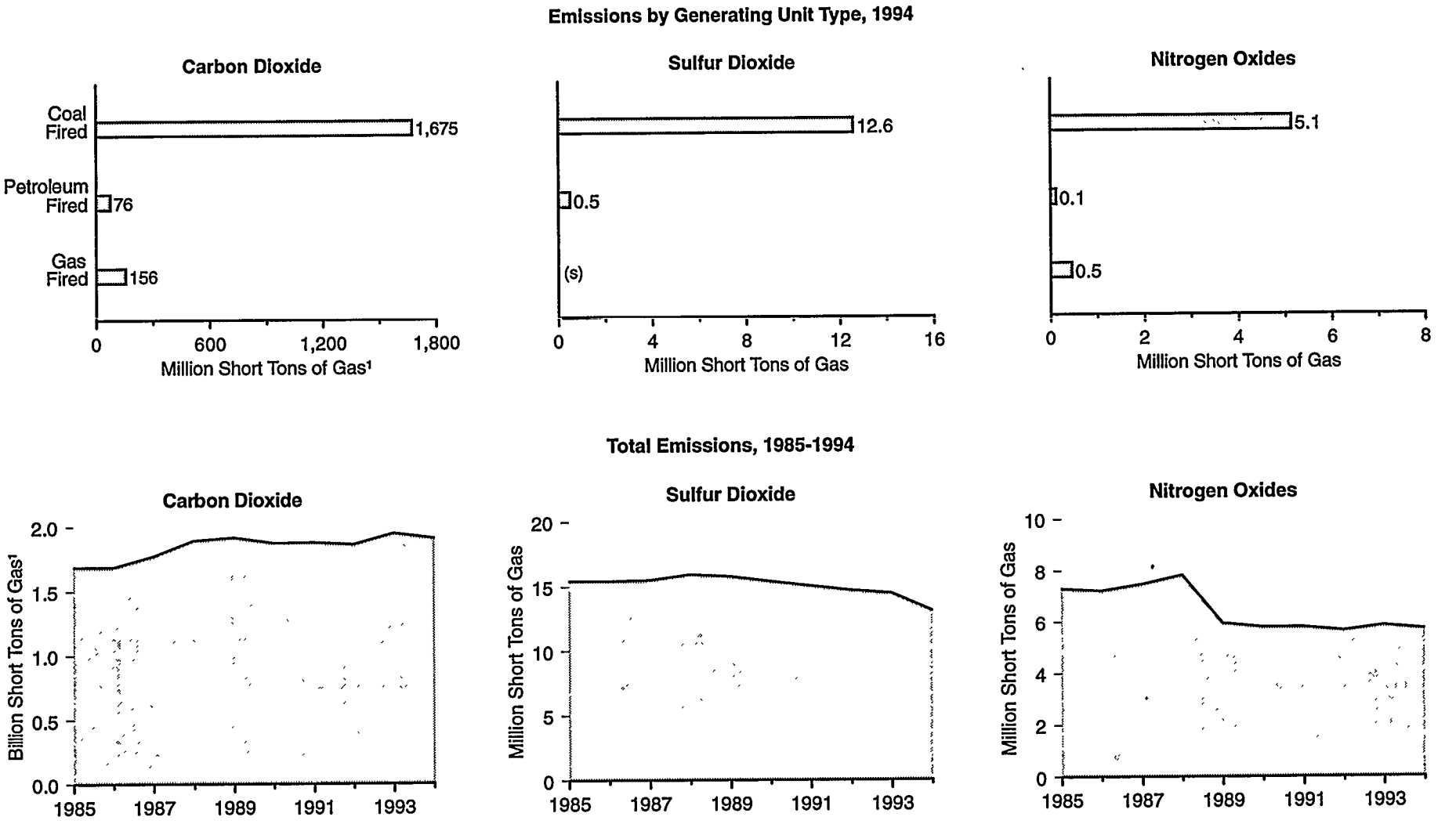
| | Energy Sources | | | | | Area Sources | Agricultural Sources | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Oil and Gas | Coal Mining | Transportation | Stationary Combustion | Total | Landfills | Ruminant Animals | Animal Waste | Rice Paddies | Crop Residue Burning | Total | Industrial Processes | Total |
| 1985 | R3.15 | R3.89 | 0.32 | 0.66 | R8.02 | R10.31 | R5.27 | 2.64 | 0.36 | 0.14 | R8.41 | 0.11 | R26.86 |
| 1986 | R3.11 | R3.75 | 0.31 | 0.66 | R7.82 | R10.34 | 5.14 | R2.44 | 0.34 | 0.13 | R8.04 | 0.10 | R26.30 |
| 1987 | R3.25 | R4.03 | 0.30 | 0.65 | R8.23 | R10.53 | R5.08 | R2.63 | 0.33 | 0.12 | R8.16 | 0.11 | R27.03 |
| 1988 | R3.34 | R4.25 | 0.29 | 0.66 | R8.54 | R10.64 | R5.10 | R2.65 | 0.41 | 0.10 | R8.26 | 0.12 | R27.56 |
| 1989 | R3.34 | R4.33 | 0.28 | 0.69 | R8.64 | R10.65 | R5.08 | R2.61 | 0.38 | 0.12 | R8.19 | 0.12 | R27.60 |
| 1990 | R3.37 | R4.64 | 0.27 | 0.46 | R8.73 | R10.81 | R5.13 | R2.62 | 0.40 | 0.13 | R8.28 | 0.12 | R27.95 |
| 1991 | R3.44 | R4.40 | 0.25 | 0.48 | R8.57 | R10.72 | R5.31 | R2.72 | 0.39 | 0.12 | R8.54 | 0.11 | R27.94 |
| 1992 | R3.48 | R4.31 | R0.25 | 0.51 | R8.55 | R10.60 | R5.39 | R2.73 | 0.44 | 0.14 | 8.69 | 0.12 | R27.96 |
| 1993 | R3.18 | R3.51 | R0.24 | R0.44 | R7.37 | R10.43 | R5.46 | R2.73 | R0.40 | 0.11 | R8.69 | R0.12 | R26.62 |
| 1994 | 3.26 | NA | NA | 0.43 | NA | NA | 5.67 | 2.72 | 0.46 | 0.15 | 9.00 | 0.12 | NA |

R=Revised data.

Notes: • Most data on this table are revised, and the units are million metric tons versus thousand metric tons used last year. • Estimates of methane emissions are, in general, highly uncertain. The level of precision is probably on the order of 30 to 50 percent. For additional information, see "Uncertainties Associated with Methane Emissions" in the source report, page 100. • Anthropogenic, in the context of emissions, means "produced as the result of human activities." • Ruminant animals, such as cattle, buffalo, sheep, goats, and camels, emit methane as a product of the digestive process. • Under certain conditions, methane may be produced naturally via anaerobic decomposition of organic materials in landfills, animal wastes, and rice paddies. • Totals may not equal sum of components due to independent rounding.

Sources: • 1985 and 1986—Energy Information Administration (EIA), Office of Integrated Analysis and Forecasting estimates. • 1987 forward—EIA, *Emissions of Greenhouse Gases in the United States 1987-1994*, October 1995, Table 15.

# Figure 12.5 Emissions From Fossil-Fueled Steam-Electric Generating Units at Electric Utilities




¹ Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

(s)=Less than 0.05 million short tons.

Note: Because horizontal and vertical scales differ, graphs should not be compared.

Source: Table 12.5.

# Table 12.5 Emissions From Fossil-Fueled Steam-Electric Generating Units at Electric Utilities, 1985-1994

(Thousand Short Tons of Gas)

| Year | Coal Fired | | | Petroleum Fired | | | Gas Fired | | | Total [1] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Dioxide[2] | Sulfur Dioxide | Nitrogen Oxides | Carbon Dioxide[2] | Sulfur Dioxide | Nitrogen Oxides | Carbon Dioxide[2] | Sulfur Dioxide | Nitrogen Oxides | Carbon Dioxide[2] | Sulfur Dioxide | Nitrogen Oxides |
| 1985 | 1,430,704 | 14,871 | 6,439 | 81,401 | 552 | 185 | 173,710 | 1 | 666 | 1,686,382 | 15,426 | 7,293 |
| 1986 | 1,422,436 | 14,654 | 6,380 | 110,655 | 762 | 260 | 150,581 | 1 | 572 | 1,685,809 | 15,418 | 7,217 |
| 1987 | 1,509,662 | 14,883 | 6,613 | 94,278 | 630 | 219 | 165,227 | 1 | 629 | 1,771,414 | 15,515 | 7,464 |
| 1988 | 1,623,317 | 15,202 | 6,963 | 114,303 | 716 | 272 | 149,834 | 1 | 580 | 1,891,049 | 15,923 | 7,822 |
| 1989 | 1,623,130 | 15,297 | 7,045 | 120,688 | 760 | 284 | 158,666 | 1 | 605 | 1,917,606 | 15,760 | 5,956 |
| 1990 | 1,613,100 | 15,038 | 7,076 | 91,978 | 623 | 219 | 157,091 | 1 | 588 | 1,874,153 | 15,369 | 5,801 |
| 1991 | 1,621,926 | 14,695 | 7,078 | 87,697 | 637 | 209 | 159,562 | 1 | 602 | 1,878,839 | 15,012 | 5,801 |
| 1992 | 1,625,788 | 14,445 | 7,113 | 69,803 | 531 | 167 | 159,221 | 1 | 601 | 1,863,361 | 14,680 | 5,674 |
| 1993 | 1,711,673 | 13,844 | 5,288 | 84,129 | 583 | 136 | 146,584 | 1 | 424 | 1,946,266 | 14,432 | 5,852 |
| 1994 | 1,675,006 | 12,590 | 5,148 | 75,523 | 510 | 118 | 156,222 | 1 | 450 | 1,909,510 | 13,104 | 5,719 |

[1] Total also includes plants fired by light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse.

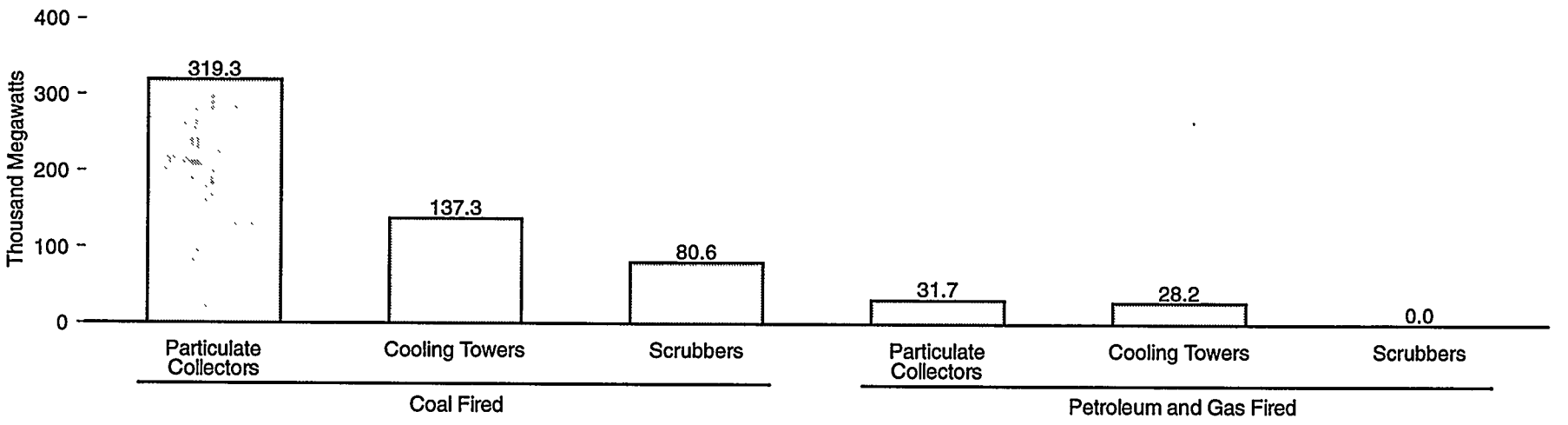
[2] Carbon dioxide gas can be converted to units of carbon by dividing by 3.667. One ton of carbon = 3.667 tons of carbon dioxide gas.

Notes: • Historical data are revised to reflect changed emission factors for the calculation of carbon dioxide and sulfur dioxide and reductions from nitrogen oxides control technologies. See Technical Notes in the *Electric Power Annual 1992* for additional information. • Emissions are based on fuel consumption data reported on Form EIA-767, "Steam-Electric Plant Operation and Design Report," for steam-electric generating units of 10 megawatts or larger. Total carbon dioxide emissions based on fuel consumption data reported on Form EIA-759, "Monthly Power Plant Report," are published in *Emissions of Greenhouse Gases in the United States 1985-1990*. • All data are preliminary and may be revised in future publications. • Totals may not equal sum of components due to independent rounding.

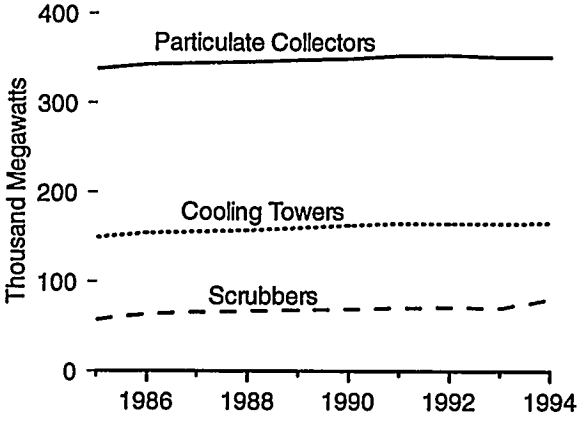
Sources: **Coal Fired, Petroleum Fired, and Gas Fired:** • 1985-1992—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1993—EIA, *Electric Power Annual 1993* (December 1994), Table 47. • 1994—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 25. **Total:** • 1985-1989—EIA, Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1990 forward—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 22.

## Figure 12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment

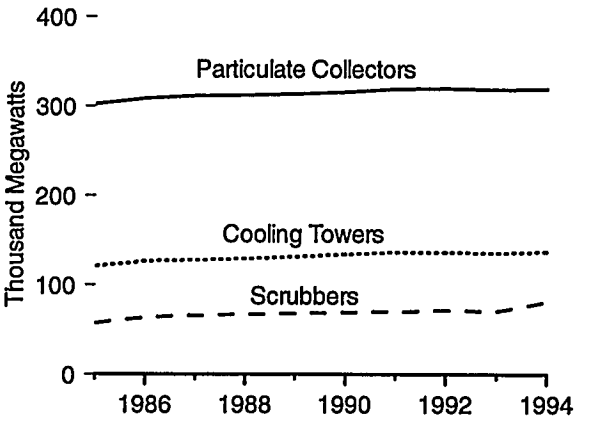
**By Fuel and Equipment Type, 1994**



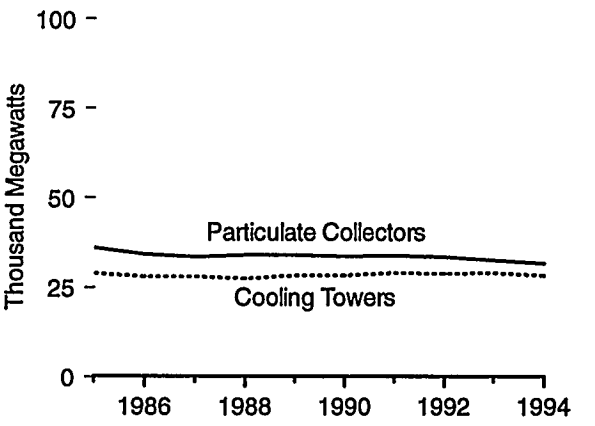

**Total Equipment by Type, 1985-1994**




**Coal-Fired Units by Equipment Type, 1985-1994**




**Petroleum- and Gas-Fired Units by Equipment Type, 1985-1994**




Note: Because vertical scales differ, graphs should not be compared.

Source: Table 12.6.

# Table 12.6 Installed Nameplate Capacity of Fossil-Fueled Steam-Electric Generators for Electric Utility Plants With Environmental Equipment, 1985-1994

(Megawatts)

| Year | Coal Fired | | | | Petroleum and Gas Fired | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Particulate Collectors | Cooling Towers | Scrubbers | Total [1] | Particulate Collectors | Cooling Towers | Scrubbers | Total [1] | Particulate Collectors | Cooling Towers | Scrubbers | Total [1] |
| 1985 | 302,056 | 120,591 | 56,955 | 304,706 | 36,054 | 28,895 | 65 | 62,371 | 338,110 | 149,486 | 57,020 | 367,078 |
| 1986 | 308,566 | 126,731 | 63,735 | 311,217 | 34,258 | 27,919 | 65 | 59,618 | 342,825 | 154,650 | 63,800 | 370,835 |
| 1987 | 311,043 | 127,875 | 65,688 | 312,885 | 33,431 | 27,912 | 65 | 58,783 | 344,474 | 155,786 | 65,753 | 371,668 |
| 1988 | 311,776 | 129,366 | 67,156 | 313,618 | 34,063 | 27,434 | 65 | 58,937 | 345,839 | 156,800 | 67,221 | 372,555 |
| 1989 | 313,708 | 131,697 | 67,506 | 315,549 | 33,975 | 28,386 | 65 | 59,736 | 347,655 | 160,087 | 67,534 | 375,257 |
| 1990 | 315,681 | 134,199 | 69,057 | 317,522 | 33,639 | 28,359 | 65 | 59,372 | 349,319 | 162,557 | 69,122 | 376,894 |
| 1991 | 319,127 | 136,270 | 70,294 | 319,189 | 33,864 | 29,067 | 260 | 59,773 | 352,990 | 165,337 | 70,554 | 378,963 |
| 1992 | 320,016 | 136,542 | 71,157 | 320,078 | 33,509 | 28,764 | 195 | 59,116 | 353,525 | 165,306 | 71,351 | 379,194 |
| 1993 | 318,830 | 136,028 | 70,890 | 318,893 | 32,620 | 28,922 | 0 | 58,580 | 351,451 | 164,951 | 70,890 | 377,473 |
| 1994 | 319,309 | 137,266 | 80,617 | 319,600 | 31,695 | 28,186 | 0 | 57,123 | 351,004 | 165,452 | 80,617 | 376,723 |

[1] Components are not additive because some generators are included in more than one category.

Notes: • Historical data are revised to include emissions from other fuels (including light oil, methane, coal-oil mixture, propane gas, blast furnace gas, wood, and refuse); to incorporate reevaluation and resubmission of data by respondents to The Clean Air Act Amendments of 1990; and to reflect revisions to the methodology used to estimate emissions. • All data are preliminary and may be revised in future publications. • Coverage is plants with fossil-fueled steam-electric capacity of 100 megawatts or greater.

Sources: **Coal Fired and Petroleum and Gas Fired:** • 1985-1993—Energy Information Administration (EIA), Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1994—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Tables 26 and 27. **Total:** • 1985 and 1989—EIA, Form EIA-767, "Steam-Electric Plant Operation and Design Report." • 1990 forward—EIA, *Electric Power Annual 1994, Volume II* (November 1995), Table 23.

# Appendix A

# Thermal Conversion Factors

## Using Thermal Conversion Factors

The thermal conversion factors presented in the following seven tables can be used to estimate the heat content in British thermal units (Btu) of a given amount of energy measured in physical units, such as barrels or cubic feet. For example, 10 barrels of asphalt has a heat content of approximately 66.36 million Btu (10 barrels x 6.636 million Btu/barrel = 66.36 million Btu).

In general, the annual thermal conversion factors presented in Tables A2 through A7 are computed from final annual data. However, if the current year's final data are not available in time for publication, thermal conversion factors for the current year are computed from the best available data and are labeled "preliminary." The source of each factor is described in the section entitled "Thermal Conversion Factor Source Documentation," which follows Table A7 in this appendix.

Thermal conversion factors for hydrocarbon mixes are weighted averages of the thermal conversion factors for each hydrocarbon included in the mix. For example, in calculating the thermal conversion factor for a 60-40 butane-propane mixture, the thermal conversion factor for butane is weighted 1.5 times more heavily than the thermal conversion factor for propane.

More information about British thermal units (the standardized unit of measure for energy) can be found in Appendix D, "Energy Units in Perspective," and in the Glossary.

**Table A1. Approximate Heat Content of Petroleum Products**
(Million Btu per Barrel)

| Energy Source | Heat Content |
|---|---|
| Asphalt | 6.636 |
| Aviation Gasoline | 5.048 |
| Butane | 4.326 |
| Butane-Propane Mixture (60 percent-40 percent) | 4.130 |
| Distillate Fuel Oil | 5.825 |
| Ethane | 3.082 |
| Ethane-Propane Mixture (70 percent-30 percent) | 3.308 |
| Isobutane | 3.974 |
| Jet Fuel, Kerosene-Type | 5.670 |
| Jet Fuel, Naphtha-Type | 5.355 |
| Kerosene | 5.670 |
| Lubricants | 6.065 |
| Motor Gasoline | 5.253 |
| Natural Gasoline | 4.620 |
| Pentanes Plus | 4.620 |
| Petrochemical Feedstocks | |
| Naphtha less than 401° F | 5.248 |
| Other Oils equal to or greater than 401° F | 5.825 |
| Still Gas | 6.000 |
| Petroleum Coke | 6.024 |
| Plant Condensate | 5.418 |
| Propane | 3.836 |
| Residual Fuel Oil | 6.287 |
| Road Oil | 6.636 |
| Special Naphthas | 5.248 |
| Still Gas | 6.000 |
| Unfinished Oils | 5.825 |
| Unfractionated Stream | 5.418 |
| Waxes | 5.537 |
| Miscellaneous | 5.796 |

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A2. Approximate Heat Content of Crude Oil, Crude Oil and Products, and Natural Gas Plant Liquids, 1949-1995

(Million Btu per Barrel)

| Year | Crude Oil Only | | | Crude Oil and Products | | Natural Gas Plant Liquids Production |
|---|---|---|---|---|---|---|
| | Production | Imports | Exports | Imports | Exports | |
| 1949 | 5.800 | 5.952 | 5.800 | 6.059 | 5.692 | 4.544 |
| 1950 | 5.800 | 5.943 | 5.800 | 6.080 | 5.766 | 4.522 |
| 1951 | 5.800 | 5.938 | 5.800 | 6.075 | 5.762 | 4.495 |
| 1952 | 5.800 | 5.938 | 5.800 | 6.067 | 5.774 | 4.464 |
| 1953 | 5.800 | 5.924 | 5.800 | 6.052 | 5.742 | 4.450 |
| 1954 | 5.800 | 5.931 | 5.800 | 6.052 | 5.745 | 4.415 |
| 1955 | 5.800 | 5.924 | 5.800 | 6.040 | 5.768 | 4.406 |
| 1956 | 5.800 | 5.916 | 5.800 | 6.024 | 5.754 | 4.382 |
| 1957 | 5.800 | 5.918 | 5.800 | 6.023 | 5.780 | 4.369 |
| 1958 | 5.800 | 5.916 | 5.800 | 5.993 | 5.779 | 4.366 |
| 1959 | 5.800 | 5.916 | 5.800 | 6.020 | 5.829 | 4.311 |
| 1960 | 5.800 | 5.911 | 5.800 | 6.021 | 5.834 | 4.295 |
| 1961 | 5.800 | 5.900 | 5.800 | 5.991 | 5.832 | 4.283 |
| 1962 | 5.800 | 5.890 | 5.800 | 6.004 | 5.841 | 4.273 |
| 1963 | 5.800 | 5.894 | 5.800 | 6.002 | 5.840 | 4.264 |
| 1964 | 5.800 | 5.882 | 5.800 | 5.998 | 5.844 | 4.268 |
| 1965 | 5.800 | 5.872 | 5.800 | 5.997 | 5.743 | 4.264 |
| 1966 | 5.800 | 5.863 | 5.800 | 5.993 | 5.729 | 4.259 |
| 1967 | 5.800 | 5.838 | 5.800 | 5.999 | 5.777 | 4.232 |
| 1968 | 5.800 | 5.836 | 5.800 | 5.977 | 5.763 | 4.218 |
| 1969 | 5.800 | 5.825 | 5.800 | 5.974 | 5.714 | 4.170 |
| 1970 | 5.800 | 5.822 | 5.800 | 5.985 | 5.810 | 4.146 |
| 1971 | 5.800 | 5.824 | 5.800 | 5.961 | 5.775 | 4.117 |
| 1972 | 5.800 | 5.809 | 5.800 | 5.935 | 5.741 | 4.070 |
| 1973 | 5.800 | 5.817 | 5.800 | 5.897 | 5.752 | 4.049 |
| 1974 | 5.800 | 5.827 | 5.800 | 5.884 | 5.774 | 4.011 |
| 1975 | 5.800 | 5.821 | 5.800 | 5.858 | 5.748 | 3.984 |
| 1976 | 5.800 | 5.808 | 5.800 | 5.856 | 5.745 | 3.964 |
| 1977 | 5.800 | 5.810 | 5.800 | 5.834 | 5.797 | 3.941 |
| 1978 | 5.800 | 5.802 | 5.800 | 5.839 | 5.808 | 3.925 |
| 1979 | 5.800 | 5.810 | 5.800 | 5.810 | 5.832 | 3.955 |
| 1980 | 5.800 | 5.812 | 5.800 | 5.796 | 5.820 | 3.914 |
| 1981 | 5.800 | 5.818 | 5.800 | 5.775 | 5.821 | 3.930 |
| 1982 | 5.800 | 5.826 | 5.800 | 5.775 | 5.820 | 3.872 |
| 1983 | 5.800 | 5.825 | 5.800 | 5.774 | 5.800 | 3.839 |
| 1984 | 5.800 | 5.823 | 5.800 | 5.745 | 5.850 | 3.812 |
| 1985 | 5.800 | 5.832 | 5.800 | 5.736 | 5.814 | 3.815 |
| 1986 | 5.800 | 5.903 | 5.800 | 5.808 | 5.832 | 3.797 |
| 1987 | 5.800 | 5.901 | 5.800 | 5.820 | 5.858 | 3.804 |
| 1988 | 5.800 | 5.900 | 5.800 | 5.820 | 5.840 | 3.800 |
| 1989 | 5.800 | 5.906 | 5.800 | 5.833 | 5.857 | 3.826 |
| 1990 | 5.800 | 5.934 | 5.800 | 5.849 | 5.833 | 3.822 |
| 1991 | 5.800 | 5.948 | 5.800 | 5.873 | 5.823 | 3.807 |
| 1992 | 5.800 | 5.953 | 5.800 | 5.877 | 5.777 | 3.804 |
| 1993 | 5.800 | 5.954 | 5.800 | 5.883 | 5.779 | 3.801 |
| 1994 | 5.800 | [R]5.950 | 5.800 | [R]5.861 | 5.781 | 3.794 |
| 1995[P] | 5.800 | 5.956 | 5.800 | 5.875 | 5.751 | 3.797 |

R=Revised data. P=Preliminary data.
Note: Includes lease condensate.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A3. Approximate Heat Content of Petroleum Product Weighted Averages, 1949-1995

(Million Btu per Barrel)

| Year | Consumption | | | | | Imports | Exports |
|---|---|---|---|---|---|---|---|
| | Residential and Commercial | Industrial | Transportation | Electric Utilities | Total | | |
| 1949 | 5.631 | 5.947 | 5.465 | 6.254 | 5.649 | 6.261 | 5.651 |
| 1950 | 5.626 | 5.940 | 5.461 | 6.254 | 5.649 | 6.263 | 5.751 |
| 1951 | 5.626 | 5.913 | 5.458 | 6.254 | 5.634 | 6.265 | 5.753 |
| 1952 | 5.621 | 5.905 | 5.442 | 6.254 | 5.621 | 6.261 | 5.768 |
| 1953 | 5.606 | 5.897 | 5.426 | 6.254 | 5.608 | 6.268 | 5.732 |
| 1954 | 5.603 | 5.883 | 5.412 | 6.254 | 5.595 | 6.252 | 5.738 |
| 1955 | 5.607 | 5.866 | 5.408 | 6.254 | 5.591 | 6.234 | 5.765 |
| 1956 | 5.601 | 5.856 | 5.406 | 6.254 | 5.585 | 6.225 | 5.744 |
| 1957 | 5.587 | 5.842 | 5.405 | 6.254 | 5.577 | 6.219 | 5.774 |
| 1958 | 5.582 | 5.832 | 5.393 | 6.254 | 5.567 | 6.091 | 5.778 |
| 1959 | 5.549 | 5.811 | 5.389 | 6.254 | 5.557 | 6.142 | 5.830 |
| 1960 | 5.570 | 5.800 | 5.388 | 6.267 | 5.555 | 6.161 | 5.835 |
| 1961 | 5.570 | 5.795 | 5.386 | 6.268 | 5.552 | 6.102 | 5.833 |
| 1962 | 5.555 | 5.784 | 5.386 | 6.267 | 5.545 | 6.138 | 5.842 |
| 1963 | 5.532 | 5.759 | 5.384 | 6.266 | 5.534 | 6.126 | 5.841 |
| 1964 | 5.517 | 5.728 | 5.388 | 6.267 | 5.528 | 6.129 | 5.845 |
| 1965 | 5.535 | 5.728 | 5.387 | 6.267 | 5.532 | 6.123 | 5.742 |
| 1966 | 5.523 | 5.722 | 5.388 | 6.266 | 5.532 | 6.112 | 5.728 |
| 1967 | 5.473 | 5.682 | 5.391 | 6.266 | 5.515 | 6.128 | 5.758 |
| 1968 | 5.450 | 5.646 | 5.394 | 6.263 | 5.504 | 6.095 | 5.762 |
| 1969 | 5.399 | 5.603 | 5.394 | 6.259 | 5.492 | 6.093 | 5.713 |
| 1970 | 5.404 | 5.604 | 5.393 | 6.252 | 5.503 | 6.088 | 5.811 |
| 1971 | 5.392 | 5.600 | 5.389 | 6.245 | 5.504 | 6.062 | 5.775 |
| 1972 | 5.368 | 5.564 | 5.388 | 6.233 | 5.500 | 6.045 | 5.741 |
| 1973 | 5.387 | 5.568 | 5.395 | 6.245 | 5.515 | 5.983 | 5.752 |
| 1974 | 5.377 | 5.538 | 5.394 | 6.238 | 5.504 | 5.959 | 5.773 |
| 1975 | 5.358 | 5.528 | 5.392 | 6.250 | 5.494 | 5.935 | 5.747 |
| 1976 | 5.383 | 5.538 | 5.395 | 6.251 | 5.504 | 5.980 | 5.743 |
| 1977 | 5.389 | 5.555 | 5.400 | 6.249 | 5.518 | 5.908 | 5.796 |
| 1978 | 5.382 | 5.553 | 5.404 | 6.251 | 5.519 | 5.955 | 5.814 |
| 1979 | 5.471 | 5.418 | 5.428 | 6.258 | 5.494 | 5.811 | 5.864 |
| 1980 | 5.468 | 5.376 | 5.440 | 6.254 | 5.479 | 5.748 | 5.841 |
| 1981 | 5.409 | 5.313 | 5.432 | 6.258 | 5.448 | 5.659 | 5.837 |
| 1982 | 5.392 | 5.263 | 5.422 | 6.258 | 5.415 | 5.664 | 5.829 |
| 1983 | 5.286 | 5.273 | 5.415 | 6.255 | 5.406 | 5.677 | 5.800 |
| 1984 | 5.384 | 5.223 | 5.422 | 6.251 | 5.395 | 5.613 | 5.867 |
| 1985 | 5.326 | 5.221 | 5.423 | 6.247 | 5.387 | 5.572 | 5.819 |
| 1986 | 5.357 | 5.286 | 5.427 | 6.257 | 5.418 | 5.624 | 5.839 |
| 1987 | 5.316 | 5.253 | 5.430 | 6.249 | 5.403 | 5.599 | 5.860 |
| 1988 | 5.320 | 5.248 | 5.434 | 6.250 | 5.410 | 5.618 | 5.842 |
| 1989 | 5.257 | 5.233 | 5.440 | 6.241 | 5.410 | 5.641 | 5.869 |
| 1990 | 5.208 | 5.272 | 5.445 | 6.247 | 5.411 | 5.614 | 5.838 |
| 1991 | 5.163 | 5.192 | 5.442 | 6.248 | 5.384 | 5.636 | 5.827 |
| 1992 | 5.169 | 5.188 | 5.445 | 6.243 | 5.378 | 5.623 | 5.774 |
| 1993 | 5.148 | 5.200 | 5.438 | 6.241 | 5.379 | 5.620 | 5.777 |
| 1994 | R5.154 | R5.171 | R5.442 | 6.231 | R5.371 | 5.538 | 5.779 |
| 1995P | 5.150 | 5.150 | 5.439 | 6.210 | 5.358 | 5.510 | 5.746 |

R=Revised data. P=Preliminary data.

Note: Weighted averages of the products included in each category are calculated by using heat content values shown in Table A1.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A4. Approximate Heat Content of Natural Gas, 1949-1995

(Btu per Cubic Foot)

| Year | Production | | Consumption | | | Imports | Exports |
|---|---|---|---|---|---|---|---|
| | Dry | Marketed (Wet) | Sectors Other Than Electric Utilities | Electric Utilities | Total | | |
| 1949 | 1,035 | 1,120 | 1,035 | 1,035 | 1,035 | — | 1,035 |
| 1950 | 1,035 | 1,119 | 1,035 | 1,035 | 1,035 | — | 1,035 |
| 1951 | 1,035 | 1,114 | 1,035 | 1,035 | 1,035 | — | 1,035 |
| 1952 | 1,035 | 1,115 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1953 | 1,035 | 1,116 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1954 | 1,035 | 1,115 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1955 | 1,035 | 1,120 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1956 | 1,035 | 1,116 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1957 | 1,035 | 1,113 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1958 | 1,035 | 1,110 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1959 | 1,035 | 1,109 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1960 | 1,035 | 1,107 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1961 | 1,035 | 1,108 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1962 | 1,035 | 1,107 | 1,035 | 1,035 | 1,035 | 1,035 | 1,035 |
| 1963 | 1,031 | 1,103 | 1,031 | 1,031 | 1,031 | 1,031 | 1,031 |
| 1964 | 1,032 | 1,102 | 1,032 | 1,032 | 1,032 | 1,032 | 1,032 |
| 1965 | 1,032 | 1,101 | 1,032 | 1,032 | 1,032 | 1,032 | 1,032 |
| 1966 | 1,033 | 1,103 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| 1967 | 1,032 | 1,105 | 1,032 | 1,032 | 1,032 | 1,032 | 1,032 |
| 1968 | 1,031 | 1,115 | 1,031 | 1,031 | 1,031 | 1,031 | 1,031 |
| 1969 | 1,031 | 1,103 | 1,031 | 1,031 | 1,031 | 1,031 | 1,031 |
| 1970 | 1,031 | 1,102 | 1,031 | 1,031 | 1,031 | 1,031 | 1,031 |
| 1971 | 1,031 | 1,103 | 1,031 | 1,031 | 1,031 | 1,031 | 1,031 |
| 1972 | 1,027 | 1,100 | 1,027 | 1,027 | 1,027 | 1,027 | 1,027 |
| 1973 | 1,021 | 1,093 | 1,020 | 1,024 | 1,021 | 1,026 | 1,023 |
| 1974 | 1,024 | 1,097 | 1,024 | 1,022 | 1,024 | 1,027 | 1,016 |
| 1975 | 1,021 | 1,095 | 1,020 | 1,026 | 1,021 | 1,026 | 1,014 |
| 1976 | 1,020 | 1,093 | 1,019 | 1,023 | 1,020 | 1,025 | 1,013 |
| 1977 | 1,021 | 1,093 | 1,019 | 1,029 | 1,021 | 1,026 | 1,013 |
| 1978 | 1,019 | 1,088 | 1,016 | 1,034 | 1,019 | 1,030 | 1,013 |
| 1979 | 1,021 | 1,092 | 1,018 | 1,035 | 1,021 | 1,037 | 1,013 |
| 1980 | 1,026 | 1,098 | 1,024 | 1,035 | 1,026 | 1,022 | 1,013 |
| 1981 | 1,027 | 1,103 | 1,025 | 1,035 | 1,027 | 1,014 | 1,011 |
| 1982 | 1,028 | 1,107 | 1,026 | 1,036 | 1,028 | 1,018 | 1,011 |
| 1983 | 1,031 | 1,115 | 1,031 | 1,030 | 1,031 | 1,024 | 1,010 |
| 1984 | 1,031 | 1,109 | 1,030 | 1,035 | 1,031 | 1,005 | 1,010 |
| 1985 | 1,032 | 1,112 | 1,031 | 1,038 | 1,032 | 1,002 | 1,011 |
| 1986 | 1,030 | 1,110 | 1,029 | 1,034 | 1,030 | 997 | 1,008 |
| 1987 | 1,031 | 1,112 | 1,031 | 1,032 | 1,031 | 999 | 1,011 |
| 1988 | 1,029 | 1,109 | 1,029 | 1,028 | 1,029 | 1,002 | 1,018 |
| 1989 | 1,031 | 1,107 | 1,031 | 1,030 | 1,031 | 1,004 | 1,019 |
| 1990 | 1,031 | 1,106 | 1,030 | 1,034 | 1,031 | 1,012 | 1,018 |
| 1991 | 1,030 | 1,108 | 1,031 | 1,024 | 1,030 | 1,014 | 1,022 |
| 1992 | 1,030 | 1,110 | 1,031 | 1,022 | 1,030 | 1,011 | 1,018 |
| 1993 | 1,027 | 1,106 | 1,028 | 1,022 | 1,027 | 1,020 | 1,016 |
| 1994 | R1,028 | R1,105 | R1,029 | 1,022 | R1,028 | R1,022 | R1,011 |
| 1995P | 1,028 | 1,105 | 1,029 | 1,022 | 1,028 | 1,022 | 1,011 |

R=Revised data. P=Preliminary data. — = Not applicable.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A5. Approximate Heat Content of Coal and Coal Coke, 1949-1995

(Million Btu per Short Ton)

| Year | Coal | | | | | | | | Coal Coke |
|---|---|---|---|---|---|---|---|---|---|
| | | Consumption | | | | | | | |
| | Production | Residential and Commercial | Coke Plants | Other Industries [1] | Electric Utilities | Total | Imports | Exports | Imports and Exports |
| 1949 | 24.916 | 24.263 | 26.797 | 24.612 | 23.761 | 24.793 | 25.000 | 26.759 | 24.800 |
| 1950 | 25.090 | 24.461 | 26.798 | 24.820 | 23.937 | 24.989 | 25.020 | 26.788 | 24.800 |
| 1951 | 25.019 | 24.281 | 26.796 | 24.521 | 23.701 | 24.813 | 25.034 | 26.848 | 24.800 |
| 1952 | 25.096 | 24.371 | 26.796 | 24.724 | 23.885 | 24.901 | 25.040 | 26.859 | 24.800 |
| 1953 | 25.147 | 24.383 | 26.796 | 24.785 | 23.964 | 25.006 | 25.048 | 26.881 | 24.800 |
| 1954 | 25.054 | 24.362 | 26.795 | 24.788 | 23.996 | 24.913 | 25.012 | 26.865 | 24.800 |
| 1955 | 25.201 | 24.373 | 26.794 | 24.821 | 24.056 | 24.982 | 25.000 | 26.907 | 24.800 |
| 1956 | 25.117 | 24.195 | 26.792 | 24.664 | 23.943 | 24.843 | 25.000 | 26.886 | 24.800 |
| 1957 | 25.213 | 24.238 | 26.792 | 24.707 | 23.980 | 24.905 | 25.001 | 26.914 | 24.800 |
| 1958 | 24.983 | 24.287 | 26.794 | 24.606 | 23.897 | 24.716 | 25.005 | 26.931 | 24.800 |
| 1959 | 24.910 | 24.224 | 26.790 | 24.609 | 23.924 | 24.719 | 25.003 | 26.927 | 24.800 |
| 1960 | 24.906 | 24.226 | 26.791 | 24.609 | 23.927 | 24.713 | 25.003 | 26.939 | 24.800 |
| 1961 | 24.849 | 24.248 | 26.792 | 24.580 | 23.904 | 24.653 | 25.002 | 26.937 | 24.800 |
| 1962 | 24.828 | 24.173 | 26.788 | 24.562 | 23.911 | 24.627 | 25.013 | 26.928 | 24.800 |
| 1963 | 24.831 | 24.033 | 26.784 | 24.509 | 23.897 | 24.588 | 25.007 | 26.894 | 24.800 |
| 1964 | 24.840 | 24.037 | 26.785 | 24.477 | 23.864 | 24.602 | 25.000 | 26.949 | 24.800 |
| 1965 | 24.775 | 24.028 | 26.787 | 24.385 | 23.780 | 24.537 | 25.000 | 26.973 | 24.800 |
| 1966 | 24.629 | 23.915 | 26.786 | 24.226 | 23.648 | 24.396 | 25.000 | 26.976 | 24.800 |
| 1967 | 24.475 | 23.685 | 26.781 | 24.040 | 23.506 | 24.243 | 25.000 | 26.981 | 24.800 |
| 1968 | 24.445 | 23.621 | 26.780 | 24.014 | 23.486 | 24.186 | 25.000 | 26.984 | 24.800 |
| 1969 | 24.280 | 23.474 | 26.779 | 23.724 | 23.240 | 23.976 | 25.000 | 26.982 | 24.800 |
| 1970 | 23.842 | 23.203 | 26.784 | 22.983 | 22.573 | 23.440 | 25.000 | 26.982 | 24.800 |
| 1971 | 23.507 | 23.090 | 26.784 | 22.670 | 22.301 | 23.124 | 25.000 | 26.981 | 24.800 |
| 1972 | 23.389 | 22.998 | 26.782 | 22.550 | 22.204 | 23.036 | 25.000 | 26.979 | 24.800 |
| 1973 | 23.376 | 22.831 | 26.780 | 22.586 | 22.246 | 23.057 | 25.000 | 26.596 | 24.800 |
| 1974 | 23.072 | 22.479 | 26.778 | 22.419 | 21.781 | 22.677 | 25.000 | 26.700 | 24.800 |
| 1975 | 22.897 | 22.261 | 26.782 | 22.436 | 21.642 | 22.506 | 25.000 | 26.562 | 24.800 |
| 1976 | 22.855 | 22.774 | 26.781 | 22.530 | 21.679 | 22.498 | 25.000 | 26.601 | 24.800 |
| 1977 | 22.597 | 22.919 | 26.787 | 22.322 | 21.508 | 22.265 | 25.000 | 26.548 | 24.800 |
| 1978 | 22.248 | 22.466 | 26.789 | 22.207 | 21.275 | 22.017 | 25.000 | 26.478 | 24.800 |
| 1979 | 22.454 | 22.242 | 26.788 | 22.452 | 21.364 | 22.100 | 25.000 | 26.548 | 24.800 |
| 1980 | 22.415 | 22.543 | 26.790 | 22.690 | 21.295 | 21.947 | 25.000 | 26.384 | 24.800 |
| 1981 | 22.308 | 22.474 | 26.794 | 22.585 | 21.085 | 21.713 | 25.000 | 26.160 | 24.800 |
| 1982 | 22.239 | 22.695 | 26.797 | 22.712 | 21.194 | 21.674 | 25.000 | 26.223 | 24.800 |
| 1983 | 22.052 | 22.775 | 26.798 | 22.691 | 21.133 | 21.576 | 25.000 | 26.291 | 24.800 |
| 1984 | 22.010 | 22.844 | 26.799 | 22.543 | 21.101 | 21.573 | 25.000 | 26.402 | 24.800 |
| 1985 | 21.870 | 22.646 | 26.798 | 22.020 | 20.959 | 21.366 | 25.000 | 26.307 | 24.800 |
| 1986 | 21.913 | 22.947 | 26.798 | 22.198 | 21.084 | 21.462 | 25.000 | 26.292 | 24.800 |
| 1987 | 21.922 | 23.404 | 26.799 | 22.381 | 21.136 | 21.517 | 25.000 | 26.291 | 24.800 |
| 1988 | 21.823 | 23.571 | 26.799 | 22.360 | 20.900 | 21.328 | 25.000 | 26.299 | 24.800 |
| 1989 | 21.765 | 23.650 | 26.800 | 22.347 | 20.848 | 21.272 | 25.000 | 26.160 | 24.800 |
| 1990 | 21.822 | 23.137 | 26.799 | 22.457 | 20.929 | 21.331 | 25.000 | 26.202 | 24.800 |
| 1991 | 21.631 | 23.114 | 26.799 | 22.460 | 20.755 | 21.146 | 25.000 | 26.188 | 24.800 |
| 1992 | 21.646 | 23.105 | 26.799 | 22.250 | 20.787 | 21.143 | 25.000 | 26.161 | 24.800 |
| 1993 | 21.388 | 22.994 | 26.800 | 22.123 | 20.639 | 20.983 | 25.000 | 26.335 | 24.800 |
| 1994 | 21.352 | R23.112 | 26.800 | R22.068 | R20.673 | R21.010 | 25.000 | 26.329 | 24.800 |
| 1995P | 21.278 | 23.165 | 26.800 | 21.909 | 20.502 | 20.852 | 25.000 | 26.207 | 24.800 |

[1] Includes transportation.
R=Revised data. P=Preliminary data.

Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A6. Approximate Heat Content of Coal by Type, 1949-1995

(Million Btu per Short Ton)

| Year | Bituminous Coal [1] and Lignite | | | | | | | | Anthracite | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consumption | | | | | | | | Consumption | | | |
| | Production | Residential and Commercial | Coke Plants | Other Industry [2] | Electric Utilities | Total | Imports | Exports | Production | Sectors Other Than Electric Utilities | Electric Utilities | Total | Imports and Exports |
| 1949 | 24.965 | 24.044 | 26.800 | 24.601 | 24.022 | 24.836 | 25.000 | 27.000 | 24.421 | 24.954 | 17.500 | 24.291 | 25.400 |
| 1950 | 25.126 | 24.162 | 26.800 | 24.804 | 24.200 | 25.024 | 25.000 | 27.000 | 24.667 | 25.297 | 17.500 | 24.592 | 25.400 |
| 1951 | 25.065 | 23.988 | 26.800 | 24.503 | 23.936 | 24.854 | 25.000 | 27.000 | 24.439 | 25.082 | 17.500 | 24.289 | 25.400 |
| 1952 | 25.157 | 24.108 | 26.800 | 24.711 | 24.118 | 24.955 | 25.000 | 27.000 | 24.400 | 25.063 | 17.500 | 24.257 | 25.400 |
| 1953 | 25.207 | 24.143 | 26.800 | 24.773 | 24.172 | 25.062 | 25.000 | 27.000 | 24.264 | 25.132 | 17.500 | 24.147 | 25.400 |
| 1954 | 25.115 | 24.144 | 26.800 | 24.775 | 24.174 | 24.971 | 25.000 | 27.000 | 24.234 | 25.015 | 17.500 | 24.130 | 25.400 |
| 1955 | 25.258 | 24.166 | 26.800 | 24.811 | 24.206 | 25.034 | 25.000 | 27.000 | 24.194 | 25.084 | 17.500 | 24.053 | 25.400 |
| 1956 | 25.187 | 24.082 | 26.800 | 24.668 | 24.080 | 24.913 | 25.000 | 27.000 | 23.899 | 24.548 | 17.500 | 23.580 | 25.400 |
| 1957 | 25.286 | 24.108 | 26.800 | 24.711 | 24.118 | 24.979 | 25.000 | 27.000 | 23.785 | 24.587 | 17.500 | 23.441 | 25.400 |
| 1958 | 25.031 | 24.039 | 26.800 | 24.592 | 24.014 | 24.758 | 25.000 | 27.000 | 24.059 | 25.003 | 17.500 | 23.903 | 25.400 |
| 1959 | 24.965 | 24.047 | 26.800 | 24.606 | 24.026 | 24.773 | 25.000 | 27.000 | 23.817 | 24.666 | 17.500 | 23.664 | 25.400 |
| 1960 | 24.960 | 24.054 | 26.800 | 24.604 | 24.029 | 24.765 | 25.000 | 27.000 | 23.717 | 24.721 | 17.500 | 23.592 | 25.400 |
| 1961 | 24.892 | 24.034 | 26.800 | 24.569 | 23.993 | 24.693 | 25.000 | 27.000 | 23.854 | 24.870 | 17.500 | 23.707 | 25.400 |
| 1962 | 24.869 | 24.027 | 26.800 | 24.558 | 23.988 | 24.668 | 25.000 | 27.000 | 23.811 | 24.666 | 17.500 | 23.515 | 25.400 |
| 1963 | 24.879 | 24.007 | 26.800 | 24.524 | 23.962 | 24.639 | 25.000 | 27.000 | 23.633 | 24.110 | 17.500 | 23.107 | 25.400 |
| 1964 | 24.887 | 23.988 | 26.800 | 24.490 | 23.928 | 24.652 | 25.000 | 27.000 | 23.507 | 24.164 | 17.500 | 23.128 | 25.400 |
| 1965 | 24.813 | 23.928 | 26.800 | 24.387 | 23.836 | 24.575 | 25.000 | 27.000 | 23.471 | 24.316 | 17.500 | 23.175 | 25.400 |
| 1966 | 24.664 | 23.836 | 26.800 | 24.227 | 23.699 | 24.431 | 25.000 | 27.000 | 23.202 | 24.193 | 17.500 | 22.906 | 25.400 |
| 1967 | 24.516 | 23.737 | 26.800 | 24.056 | 23.554 | 24.287 | 25.000 | 27.000 | 22.655 | 23.506 | 17.500 | 22.291 | 25.400 |
| 1968 | 24.487 | 23.724 | 26.800 | 24.034 | 23.531 | 24.229 | 25.000 | 27.000 | 22.426 | 23.293 | 17.500 | 22.037 | 25.400 |
| 1969 | 24.313 | 23.553 | 26.800 | 23.737 | 23.274 | 24.011 | 25.000 | 27.000 | 22.543 | 23.200 | 17.500 | 22.003 | 25.400 |
| 1970 | 23.862 | 23.111 | 26.800 | 22.973 | 22.603 | 23.461 | 25.000 | 27.000 | 22.603 | 23.476 | 17.500 | 22.102 | 25.400 |
| 1971 | 23.519 | 22.927 | 26.800 | 22.653 | 22.325 | 23.138 | 25.000 | 27.000 | 22.718 | 23.572 | 17.500 | 22.210 | 25.400 |
| 1972 | 23.400 | 22.861 | 26.800 | 22.539 | 22.225 | 23.050 | 25.000 | 27.000 | 22.422 | 23.403 | 17.500 | 21.822 | 25.400 |
| 1973 | 23.391 | 22.887 | 26.800 | 22.585 | 22.262 | 23.073 | 25.000 | 26.612 | 22.132 | 22.674 | 17.920 | 21.464 | 25.400 |
| 1974 | 23.087 | 22.523 | 26.800 | 22.420 | 21.799 | 22.694 | 25.000 | 26.716 | 21.711 | 22.330 | 17.200 | 20.919 | 25.400 |
| 1975 | 22.910 | 22.258 | 26.800 | 22.439 | 21.659 | 22.522 | 25.000 | 26.573 | 21.582 | 22.272 | 17.064 | 20.762 | 25.400 |
| 1976 | 22.863 | 22.819 | 26.800 | 22.528 | 21.692 | 22.509 | 25.000 | 26.613 | 22.045 | 22.618 | 17.526 | 21.254 | 25.400 |
| 1977 | 22.597 | 22.594 | 26.800 | 22.290 | 21.521 | 22.266 | 25.000 | 26.561 | 22.661 | 24.101 | 17.244 | 22.066 | 25.400 |
| 1978 | 22.242 | 22.078 | 26.800 | 22.175 | 21.284 | 22.014 | 25.000 | 26.501 | 23.079 | 24.388 | 17.104 | 22.398 | 25.400 |
| 1979 | 22.449 | 21.884 | 26.800 | 22.436 | 21.372 | 22.100 | 25.000 | 26.570 | 23.170 | 24.272 | 17.454 | 22.069 | 25.400 |
| 1980 | 22.411 | 22.488 | 26.800 | 22.690 | 21.301 | 21.950 | 25.000 | 26.404 | 22.869 | 22.719 | 17.652 | 21.405 | 25.400 |
| 1981 | 22.301 | 22.010 | 26.800 | 22.572 | 21.091 | 21.710 | 25.000 | 26.176 | 23.291 | 23.749 | 18.168 | 22.080 | 25.400 |
| 1982 | 22.233 | 22.226 | 26.800 | 22.695 | 21.200 | 21.670 | 25.000 | 26.231 | 23.289 | 24.578 | 18.160 | 22.518 | 25.400 |
| 1983 | 22.048 | 22.438 | 26.800 | 22.680 | 21.141 | 21.576 | 25.000 | 26.300 | 22.734 | 24.536 | 16.516 | 21.583 | 25.400 |
| 1984 | 22.005 | 22.406 | 26.800 | 22.525 | 21.108 | 21.570 | 25.000 | 26.410 | 23.107 | 25.128 | 17.018 | 22.322 | 25.400 |
| 1985 | 21.867 | 22.568 | 26.800 | 22.013 | 20.965 | 21.368 | 25.000 | 26.320 | 22.428 | 23.031 | 16.784 | 20.817 | 25.400 |
| 1986 | 21.908 | 22.669 | 26.800 | 22.185 | 21.091 | 21.462 | 25.000 | 26.308 | 23.084 | 24.399 | 15.578 | 21.512 | 25.400 |
| 1987 | 21.918 | 22.800 | 26.800 | 22.360 | 21.143 | 21.514 | 25.000 | 26.304 | 23.108 | 26.293 | 15.962 | 22.435 | 25.400 |
| 1988 | 21.817 | 23.135 | 26.800 | 22.341 | 20.905 | 21.324 | 25.000 | 26.308 | 23.266 | 26.021 | 17.312 | 22.423 | 25.400 |
| 1989 | 21.759 | 22.917 | 26.800 | 22.324 | 20.854 | 21.268 | 25.000 | 26.166 | 23.385 | 27.196 | 16.310 | 22.623 | 25.400 |
| 1990 | 21.819 | 22.678 | 26.800 | 22.444 | 20.935 | 21.330 | 25.000 | 26.207 | 22.574 | 25.199 | 16.140 | 21.668 | 25.400 |
| 1991 | 21.678 | 22.635 | 26.800 | 22.448 | 20.761 | 21.146 | 25.000 | 26.192 | 22.573 | 25.268 | 15.858 | 21.410 | 25.400 |
| 1992 | 21.643 | 22.768 | 26.800 | 22.242 | 20.792 | 21.142 | 25.000 | 26.165 | 22.572 | 24.617 | 16.944 | 21.423 | 25.400 |
| 1993 | 21.383 | 22.749 | 26.800 | 22.111 | 20.644 | 20.983 | 25.000 | 26.341 | 22.573 | 24.096 | 16.534 | 21.262 | 25.400 |
| 1994 | R21.347 | R22.683 | 26.800 | R22.046 | R20.681 | R21.011 | 25.000 | 26.335 | R22.572 | R25.037 | R14.680 | R20.828 | 25.400 |
| 1995P | 21.272 | 22.765 | 26.800 | 21.887 | 20.509 | 20.852 | 25.000 | 26.212 | 22.573 | 24.872 | 14.568 | 20.860 | 25.400 |

[1] Includes subbituminous coal.
[2] Includes transportation.

R=Revised data. P=Preliminary data.
Source: See "Thermal Conversion Factor Source Documentation," which follows Table A7.

# Table A7. Approximate Heat Rates for Electricity, 1949-1995

(Btu per Kilowatthour)

| Year | Electricity Generation | | | Electricity Consumption |
|---|---|---|---|---|
| | Fossil-Fueled Steam-Electric Plants [1] | Nuclear Steam-Electric Plants | Geothermal Energy Plants | |
| 1949 | 15,033 | — | — | 3,412 |
| 1950 | 14,030 | — | — | 3,412 |
| 1951 | 13,641 | — | — | 3,412 |
| 1952 | 13,361 | — | — | 3,412 |
| 1953 | 12,889 | — | — | 3,412 |
| 1954 | 12,180 | — | — | 3,412 |
| 1955 | 11,699 | — | — | 3,412 |
| 1956 | 11,456 | — | — | 3,412 |
| 1957 | 11,365 | 11,629 | — | 3,412 |
| 1958 | 11,085 | 11,629 | — | 3,412 |
| 1959 | 10,970 | 11,629 | — | 3,412 |
| 1960 | 10,760 | 11,629 | 23,200 | 3,412 |
| 1961 | 10,650 | 11,629 | 23,200 | 3,412 |
| 1962 | 10,558 | 11,629 | 23,200 | 3,412 |
| 1963 | 10,482 | 11,877 | 22,182 | 3,412 |
| 1964 | 10,462 | 11,912 | 22,182 | 3,412 |
| 1965 | 10,453 | 11,804 | 22,182 | 3,412 |
| 1966 | 10,415 | 11,623 | 22,182 | 3,412 |
| 1967 | 10,432 | 11,555 | 21,770 | 3,412 |
| 1968 | 10,398 | 11,297 | 21,606 | 3,412 |
| 1969 | 10,447 | 11,037 | 21,606 | 3,412 |
| 1970 | 10,494 | 10,977 | 21,606 | 3,412 |
| 1971 | 10,478 | 10,837 | 21,655 | 3,412 |
| 1972 | 10,379 | 10,792 | 21,668 | 3,412 |
| 1973 | 10,389 | 10,903 | 21,674 | 3,412 |
| 1974 | 10,442 | 11,161 | 21,674 | 3,412 |
| 1975 | 10,406 | 11,013 | 21,611 | 3,412 |
| 1976 | 10,373 | 11,047 | 21,611 | 3,412 |
| 1977 | 10,435 | 10,769 | 21,611 | 3,412 |
| 1978 | 10,361 | 10,941 | 21,611 | 3,412 |
| 1979 | 10,353 | 10,879 | 21,545 | 3,412 |
| 1980 | 10,388 | 10,908 | 21,639 | 3,412 |
| 1981 | 10,453 | 11,030 | 21,639 | 3,412 |
| 1982 | 10,454 | 11,073 | 21,629 | 3,412 |
| 1983 | 10,520 | 10,905 | 21,290 | 3,412 |
| 1984 | 10,440 | 10,843 | 21,303 | 3,412 |
| 1985 | 10,447 | 10,813 | 21,263 | 3,412 |
| 1986 | 10,446 | 10,799 | 21,263 | 3,412 |
| 1987 | 10,419 | 10,776 | 21,263 | 3,412 |
| 1988 | 10,324 | 10,743 | 21,096 | 3,412 |
| 1989 | 10,317 | 10,724 | 21,096 | 3,412 |
| 1990 | 10,335 | 10,680 | 21,096 | 3,412 |
| 1991 | 10,352 | 10,740 | 20,997 | 3,412 |
| 1992 | 10,302 | 10,678 | 20,914 | 3,412 |
| 1993 | 10,280 | 10,682 | 20,914 | 3,412 |
| 1994 | R10,272 | R10,676 | 20,914 | 3,412 |
| 1995P | 10,272 | 10,676 | 20,914 | 3,412 |

[1] Used as the thermal conversion factor for hydroelectric power generation and for wood and waste, wind, photovoltaic, and solar thermal energy consumed at electric utilities.

R=Revised data. P=Preliminary data. — = Not applicable.
Source: See "Thermal Conversion Factor Source Documentation," which follows this table.

# Thermal Conversion Factor Source Documentation

## Approximate Heat Content of Petroleum and Natural Gas Plant Liquids

**Asphalt.** The Energy Information Administration (EIA) adopted the thermal conversion factor of 6.636 million British thermal units (Btu) per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

**Aviation Gasoline.** EIA adopted the thermal conversion factor of 5.048 million Btu per barrel as adopted by the Bureau of Mines from the Texas Eastern Transmission Corporation publication *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Butane.** EIA adopted the Bureau of Mines thermal conversion factor of 4.326 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Butane-Propane Mixture.** EIA adopted the Bureau of Mines calculation of 4.130 million Btu per barrel based on an assumed mixture of 60 percent butane and 40 percent propane. See **Butane** and **Propane**.

**Crude Oil, Exports.** Assumed by EIA to be 5.800 million Btu per barrel or equal to the thermal conversion factor for crude oil produced in the United States. See **Crude Oil and Lease Condensate, Production**.

**Crude Oil, Imports.** Calculated annually by EIA by weighting the thermal conversion factor of each type of crude oil imported by the quantity imported. Thermal conversion factors for each type were calculated on a foreign country basis, by determining the average American Petroleum Institute (API) gravity of crude imported from each foreign country from Form ERA-60 in 1977 and converting average API gravity to average Btu content by using National Bureau of Standards, Miscellaneous Publication No. 97, *Thermal Properties of Petroleum Products,* 1933.

**Crude Oil and Lease Condensate, Production.** EIA adopted the thermal conversion factor of 5.800 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Crude Oil and Petroleum Products, Exports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product exported and crude oil exported weighted by the quantity of each petroleum product and crude oil exported. See **Petroleum Products, Exports** and **Crude Oil, Exports**.

**Crude Oil and Petroleum Products, Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product and each crude oil imported weighted by the quantity of each petroleum product and each type of crude oil imported. See **Crude Oil, Imports** and **Petroleum Products, Imports**.

**Distillate Fuel Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 5.825 million Btu per barrel as reported in a Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Ethane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.082 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Ethane-Propane Mixture.** EIA calculation of 3.308 million Btu per barrel based on an assumed mixture of 70 percent ethane and 30 percent propane. See **Ethane** and **Propane**.

**Isobutane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.974 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Jet Fuel, Kerosene Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel for "Jet Fuel, Commercial" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Jet Fuel, Naphtha Type.** EIA adopted the Bureau of Mines thermal conversion factor of 5.355 million Btu per barrel for "Jet Fuel, Military" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985,* a 1968 release of historical and projected statistics.

**Kerosene.** EIA adopted the Bureau of Mines thermal conversion factor of 5.670 million Btu per barrel as reported in a Bureau of Mines

internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Lubricants.** EIA adopted the thermal conversion factor of 6.065 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

**Miscellaneous Products.** EIA adopted the thermal conversion factor of 5.796 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

**Motor Gasoline.** EIA adopted the Bureau of Mines thermal conversion factor of 5.253 million Btu per barrel for "Gasoline, Motor Fuel" as published by the Texas Eastern Transmission Corporation in the report *Competition and Growth in American Energy Markets 1947-1985*, a 1968 release of historical and projected statistics.

**Natural Gas Plant Liquids, Production.** Calculated annually by EIA as the average of the thermal conversion factors of each natural gas plant liquid produced, weighted by the quantity of each natural gas plant liquid produced.

**Natural Gasoline.** EIA adopted the thermal conversion factor of 4.620 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

**Pentanes Plus.** EIA assumed the thermal conversion factor to be 4.620 million Btu or equal to that for natural gasoline. See **Natural Gasoline**.

**Petrochemical Feedstocks, Naphtha less than 401° F.** Assumed by EIA to be 5.248 million Btu per barrel, equal to the thermal conversion factor for special naphtha. See **Special Naphthas**.

**Petrochemical Feedstocks, Other Oils equal to or greater than 401° F.** Assumed by EIA to be 5.825 million Btu per barrel, equal to the thermal conversion factor for distillate fuel oil. See **Distillate Fuel Oil**.

**Petrochemical Feedstocks, Still Gas.** Assumed by EIA to be 6.000 million Btu per barrel, equal to the thermal conversion factor for still gas. See **Still Gas**.

**Petroleum Coke.** EIA adopted the thermal conversion factor of 6.024 million Btu per barrel as reported in Btu per short ton in the Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950." The Bureau of Mines calculated this factor by dividing 30,120,000 Btu per short ton, as given in the referenced Bureau of Mines internal memorandum, by 5.0 barrels per short ton, as given in the Bureau of Mines Form 6-1300-M and successor EIA forms.

**Petroleum Products, Total Consumption.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed, weighted by the quantity of each petroleum product consumed.

**Petroleum Products, Consumption by Electric Utilities.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed at electric utilities, weighted by the quantity of each petroleum product consumed at electric utilities. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report.*

**Petroleum Products, Consumption by Industrial Users.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed in the industrial sector, weighted by the estimated quantity of each petroleum product consumed in the industrial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report.*

**Petroleum Products, Consumption by Residential and Commercial Users.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed by the residential and commercial sector, weighted by the estimated quantity of each petroleum product consumed in the residential and commercial sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report.*

**Petroleum Products, Consumption by Transportation Users.** Calculated annually by EIA as the average of the thermal conversion factors for all petroleum products consumed in the transportation sector, weighted by the estimated quantity of each petroleum product consumed in the transportation sector. The quantity of petroleum products consumed is estimated in the State Energy Data System as documented in EIA's *State Energy Data Report.*

**Petroleum Products, Exports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product, weighted by the quantity of each petroleum product exported.

**Petroleum Products, Imports.** Calculated annually by EIA as the average of the thermal conversion factors for each petroleum product imported, weighted by the quantity of each petroleum product imported.

**Plant Condensate.** Estimated to be 5.418 million Btu per barrel by EIA from data provided by McClanahan Consultants, Inc., Houston, Texas.

**Propane.** EIA adopted the Bureau of Mines thermal conversion factor of 3.836 million Btu per barrel as published in the *California Oil World and Petroleum Industry*, First Issue, April 1942.

**Residual Fuel Oil.** EIA adopted the thermal conversion factor of 6.287 million Btu per barrel as reported in the Bureau of Mines internal memorandum, "Bureau of Mines Standard Average Heating Values of Various Fuels, Adopted January 3, 1950."

**Road Oil.** EIA adopted the Bureau of Mines thermal conversion factor of 6.636 million Btu per barrel, which was assumed to be equal to that of asphalt (see **Asphalt**) and was first published by the Bureau of Mines in the *Petroleum Statement, Annual, 1970.*

**Special Naphthas.** EIA adopted the Bureau of Mines thermal conversion factor of 5.248 million Btu per barrel, which was assumed to be equal to that of the total gasoline (aviation and motor) factor and was first published in the *Petroleum Statement, Annual, 1970.*

**Still Gas.** EIA adopted the Bureau of Mines estimated thermal conversion factor of 6.000 million Btu per barrel, first published in the *Petroleum Statement, Annual, 1970.*

**Unfinished Oil.** EIA assumed the thermal conversion factor to be 5.825 million Btu per barrel or equal to that for distillate fuel oil (see **Distillate Fuel Oil**) and first published it in EIA's *Annual Report to Congress, Volume 3, 1977.*

**Unfractionated Stream.** EIA assumed the thermal conversion factor to be 5.418 million Btu per barrel or equal to that for plant condensate (see **Plant Condensate**) and first published it in EIA's *Annual Report to Congress, Volume 2, 1981.*

**Wax.** EIA adopted the thermal conversion factor of 5.537 million Btu per barrel as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.*

## Approximate Heat Content of Natural Gas

**Natural Gas, Total Consumption.** • 1949-1962: EIA adopted the thermal conversion factor of 1,035 Btu per cubic foot as estimated by the Bureau of Mines and first published in the *Petroleum Statement, Annual, 1956.* • 1963-1979: EIA adopted the thermal conversion factor calculated annually by the American Gas Association (AGA) and published in *Gas Facts*, an AGA annual publication. • 1980-1992: Calculated annually by EIA by dividing the total heat content of natural gas consumed by the total quantity of natural gas consumed. The heat content and quantity consumed are from Form EIA-176. Published sources are: • 1980-1989: EIA, *Natural Gas Annual 1992, Volume 2*, Table 15. • 1990-1992: EIA, *Natural Gas Annual 1992, Volume 2*, Table 16. • 1993: 1992 value used as an estimate.

**Natural Gas, Exports.** • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption.** • 1973 forward: Calculated annually by EIA by dividing the heat content of exported natural gas by the quantity of natural gas exported, both reported on Form FPC-14.

**Natural Gas, Imports.** • 1949-1972: Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption.** • 1973 forward: Calculated annually by EIA by dividing the heat content of imported natural gas by the quantity of natural gas imported, both reported on Form FPC-14.

**Natural Gas, Production (Dry).** Assumed by EIA to be equal to the thermal conversion factor for the consumption of dry natural gas. See **Natural Gas, Total Consumption.**

**Natural Gas, Production (Wet).** Calculated annually by EIA by adding the heat content of natural gas, dry production, and the total heat content of natural gas plant liquids production and dividing this sum by the total quantity of marketed (wet) natural gas production.

## Approximate Heat Content of Coal and Coal Coke

**Anthracite, Total Consumption.** Calculated annually by EIA by dividing the sum of the heat content of anthracite consumed by electric utilities and all other sectors combined by the total quantity of anthracite consumed.

**Anthracite, Consumption by Electric Utilities.** • 1949-1972: Assumed by EIA that all anthracite consumed at electric utilities was recovered from culm banks and river dredging and estimated to have an average heat content of 17.500 million Btu per short ton. • 1973 forward: Calculated annually by EIA by dividing the heat content of anthracite receipts at electric utilities by the quantity of anthracite received at electric utilities, as reported on Form FERC-423 and predecessor forms.

**Anthracite, Consumption by Sectors Other Than Electric Utilities.** Calculated annually by EIA by dividing the heat content of anthracite production less the heat content of the anthracite consumed at electric utilities, net exports, and shipments to U.S. Armed Forces overseas by the quantity of anthracite consumed by sectors other than electric utilities, less the quantity of anthracite stock changes, losses, and "unaccounted for."

**Anthracite, Imports and Exports.** EIA assumed the anthracite imports and exports to be freshly mined anthracite having an estimated heat content of 25.400 million Btu per short ton.

**Anthracite, Production.** Calculated annually by EIA by dividing the sum of the heat content of freshly mined anthracite (estimated to have an average heat content of 25.400 million Btu per short ton) and the heat content of anthracite recovered from culm banks and river dredging (estimated to have an average heat content of 17.500 million Btu per short ton) by the total quantity of anthracite produced.

**Bituminous Coal and Lignite, Total Consumption.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumed by electric utilities, coal coke plants, other industrial plants, and by the residential and commercial sector and the transportation sector by the sum of their respective tonnages.

**Bituminous Coal and Lignite, Consumption by Coke Plants.** Estimated by EIA to be 26.800 million Btu per short ton based on input-output analysis of coal carbonization.

**Bituminous Coal and Lignite, Consumption by Electric Utilities.** • 1949-1972: EIA adopted the average thermal conversion factor of the Bureau of Mines, which used the National Coal Association average thermal conversion factor for electric utilities calculated from Form FPC-1 and published in *Steam Electric Plant Factors*, a National Coal Association annual report. • 1973 forward: Calculated annually by EIA by dividing the total heat content of bituminous coal and lignite received at electric utilities by the total quantity received at electric utilities. Heat contents and receipts are from Form FERC-423 and predecessor forms.

**Bituminous Coal and Lignite, Consumption by Other Industrial Users.** • 1949-1973: Calculated annually by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by other industrial users and that of coal consumed at electric utilities in the 1974-1983 period. • 1974 forward: Calculated annually by EIA by assuming that the bituminous coal and lignite delivered to other industrial users from each coal-producing area (reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to that of bituminous coal and lignite received at electric utilities from each of the same coal-producing areas (reported on Form FERC-423). The average Btu value of coal by coal-producing area was applied to the volume of deliveries to other industrial users from each coal-producing area, and the sum total of the heat content was divided by the total volume of deliveries. Coal-producing areas are the Bureau of Mines coal-producing districts for 1974 through 1989 and coal-producing States for 1990 forward.

**Bituminous Coal and Lignite, Consumption by Residential and Commercial Users.** • 1949-1973: Calculated annually by EIA through regression analysis measuring the difference between the average Btu value of coal consumed by residental and commercial users and that of coal consumed by electric utilities in the 1974-1983 period. • 1974 forward: Calculated annually by EIA by assuming that the bituminous coal and lignite delivered to residential and commercial users from each coal-producing area (reported on Form EIA-6 and predecessor Bureau of Mines Form 6-1419-Q) contained a heat value equal to that of bituminous coal and lignite received at electric utilities from each of the same coal-producing areas (reported on Form FERC-423). The average Btu value of coal by coal-producing area was applied to the volume of deliveries to residential and commercial users from each coal-producing area, and the sum total of the heat value was divided by the total volume of deliveries. Coal-producing areas are the Bureau

of Mines coal-producing districts for 1974 through 1989 and coal-producing States for 1990 forward.

**Bituminous Coal and Lignite, Consumption by Transportation Users.** Assumed by EIA to be equal to the Btu conversion factor for **Bituminous Coal and Lignite, Consumption by Other Industrial Users.**

**Bituminous Coal and Lignite, Exports.** • 1949-1972: Assumed by EIA to be all metallurgical coal and to have an average thermal content of 27.000 million Btu per short ton. • 1973 forward: Calculated annually by EIA by dividing the sum of the heat content of exported metallurgical coal (estimated to average 27.000 million Btu per short ton) and the heat content of exported steam coal (estimated to have an average thermal content of 25.000 million Btu per short ton) by the total quantity of bituminous coal and lignite exported.

**Bituminous Coal and Lignite, Imports.** EIA estimated the average thermal conversion factor to be 25.000 million Btu per short ton.

**Bituminous Coal and Lignite, Production.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite consumption, net exports, stock changes, and unaccounted for by the sum of their respective tonnages. Consumers' stock changes by sectors were assumed to have the same conversion factor as that for the consumption sector. Producers' stock changes and unaccounted for were assumed to have the same conversion factor as that for consumption by all users.

**Coal, Total Consumption.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumption by the sum of their respective tonnages.

**Coal, Consumption by Electric Utilities.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite received at electric utilities by the sum of their respective tonnages received.

**Coal, Consumption by Sectors Other Than Electric Utilities.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite consumed by sectors other than electric utilities by the sum of their respective tonnages.

**Coal, Exports.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite exported by the sum of their respective tonnages.

**Coal, Imports.** Calculated annually by EIA by dividing the sum of the heat content of bituminous coal and lignite and anthracite imported by the sum of their respective tonnages.

**Coal, Production.** Calculated annually by EIA by dividing the sum of the total heat content of bituminous coal and lignite and anthracite produced by the sum of their respective tonnages.

**Coal Coke, Imports and Exports.** EIA adopted the Bureau of Mines estimate of 24.800 million Btu per short ton.

## Approximate Heat Rates for Electricity

**Fossil-Fueled Steam-Electric Plant Generation.** There is no generally accepted practice for measuring the thermal conversion rates for power plants that generate electricity from hydroelectric, wood and waste, wind, photovoltaic, or solar thermal energy sources. Therefore, EIA used data from Form EIA-767, "Steam-Electric Power Operation and Design Report," to calculate a rate factor that is equal to the prevailing annual average heat rate factor for fossil-fueled steam-electric power plants in the United States. By using that factor, it is possible to evaluate fossil fuel requirements for replacing those sources during periods of interruption, such as droughts. The heat content of a kilowatthour of electricity produced, regardless of the generation process, is 3,412 Btu. • 1949-1955: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published by EIA in *Thermal-Electric Plant Construction Cost and Annual Production Expenses–1981* and *Steam-Electric Plant Construction Cost and Annual Production Expenses–1978.* • 1956-1991: The weighted annual average heat rate for fossil-fueled steam-electric power plants in the United States, as published in EIA, *Electric Plant Cost and Power Production Expenses 1991,* Table 9. • 1992 forward: Unpublished factors calculated on the basis of data from Form EIA-676, "Steam-Electric Plant Operation and Design Report."

**Geothermal Energy Plant Generation.** • 1960-1981: Calculated annually by EIA by weighting the annual average heat rates of operating geothermal units by the installed nameplate capacities as reported on Form FPC-12, "Power System Statement." • 1982 forward: Estimated annually by EIA on the basis of an informal survey of relevant plants.

**Nuclear Steam-Electric Plant Generation.** • 1957-1991: Calculated annually by EIA by dividing the total heat content consumed in nuclear generating units by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation are reported on Form FERC-1, "Annual Report of Major Electric Utilities, Licensees, and Others," Form EIA-412, "Annual Report of Public Electric Utilities," and predecessor forms. The factors, beginning with 1982 data, are published in the following EIA reports—1982: *Historical Plant Cost and Annual Production Expenses for Selected Electric Plants 1982*, page 215. 1983-1991: *Electric Plant Cost and Power Production Expenses 1991*, Table 13. 1992 forward: Calculated annually by EIA by dividing the total heat content of the steam leaving the nuclear generating units to generate electricity by the total (net) electricity generated by nuclear generating units. The heat content and electricity generation data are reported in Nuclear Regulatory Commission, *Licensed Operating Reactors—Status Summary Report.*

## Appendix B

# Metric and Other Physical Conversion Factors

Data presented in the *Annual Energy Review* and in other Energy Information Administration publications are expressed predominately in units that historically have been used in the United States, such as British thermal units, barrels, cubic feet, and short tons. However, because U.S. commerce involves other nations, most of which use metric units of measure, the U.S. Government is committed to the transition to the metric system, as stated in the Metric Conversion Act of 1975 (Public Law 94–168), amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100–418), and Executive Order 12770 of July 25, 1991.

The metric conversion factors presented in Table B1 can be used to calculate the metric-unit equivalents of values expressed in U.S. customary units. For example, 500 short tons is the equivalent of 453.6 metric tons (500 short tons x 0.9071847 metric tons/short ton = 453.6 metric tons).

In the metric system of weights and measures, the names of multiples and subdivisions of any unit may be derived by combining the name of the unit with prefixes, such as deka, hecto, and kilo, meaning, respectively, 10, 100, 1,000, and deci, centi, and milli, meaning, respectively, one-tenth, one-hundredth, and one-thousandth. Common metric prefixes can be found in Table B2.

The conversion factors presented in Table B3 can be used to calculate equivalents in various physical units commonly used in energy analyses. For example, 10 barrels is the equivalent of 420 U.S. gallons (10 barrels x 42 gallons/barrel = 420 gallons).

## Table B1. Metric Conversion Factors

| U.S. Unit | *multiplied by* | Conversion Factor | *equals* | Metric Unit |
|---|---|---|---|---|
| **Mass** | | | | |
| short tons (2,000 lb) | x | 0.907 184 7 | = | metric tons (t) |
| long tons | x | 1.016 047 | = | metric tons (t) |
| pounds (lb) | x | 0.453 592 37[a] | = | kilograms (kg) |
| pounds uranium oxide (lb $U_3O_8$) | x | 0.384 647[b] | = | kilograms uranium (kgU) |
| ounces, avoirdupois (avdp oz) | x | 28.349 52 | = | grams (g) |
| **Length** | | | | |
| miles (mi) | x | 1.609 344[a] | = | kilometers (km) |
| yards (yd) | x | 0.914 4[a] | = | meters (m) |
| feet (ft) | x | 0.304 8[a] | = | meters (m) |
| inches (in) | x | 2.54[a] | = | centimeters (cm) |
| **Energy** | | | | |
| British thermal units (Btu) | x | 1,055.056[c] | = | joules (J) |
| calories (cal) | x | 4.186 8[a] | = | joules (J) |
| kilowatthours (kWh) | x | 3.6[a] | = | megajoules (MJ) |
| **Volume** | | | | |
| barrels of oil (bbl) | x | 0.158 987 3 | = | cubic meters ($m^3$) |
| cubic yards ($yd^3$) | x | 0.764 555 | = | cubic meters ($m^3$) |
| cubic feet ($ft^3$) | x | 0.028 316 85 | = | cubic meters ($m^3$) |
| U.S. gallons (gal) | x | 3.785 412 | = | liters (L) |
| ounces, fluid (fl oz) | x | 29.573 53 | = | milliliters (mL) |
| cubic inches ($in^3$) | x | 16.387 06 | = | milliliters (mL) |
| **Area** | | | | |
| acres | x | 0.404 69 | = | hectares (ha) |
| square miles ($mi^2$) | x | 2.589 988 | = | square kilometers ($km^2$) |
| square yards ($yd^2$) | x | 0.836 127 4 | = | square meters ($m^2$) |
| square feet ($ft^2$) | x | 0.092 903 04[a] | = | square meters ($m^2$) |
| square inches ($in^2$) | x | 6.451 6[a] | = | square centimeters ($cm^2$) |
| **Temperature** | | | | |
| degrees Fahrenheit (°F) | x | 5/9 (after subtracting 32)[a,d] | = | degrees Celsius (°C) |

[a]Exact conversion.
[b]Calculated by the Energy Information Administration.
[c]The Btu used in this table is the International Table Btu adopted by the Fifth International Conference on Properties of Steam, London, 1956.
[d]To convert degrees Celsius (°C) to degrees Fahrenheit (°F) exactly, multiply by 9/5, then add 32.

Notes: Spaces have been inserted after every third digit to the right of the decimal for ease of reading. Most metric units belong to the International System of Units (SI), and the liter, hectare, and metric ton are accepted for use with the SI units. For more information about the SI units, contact Dr. Barry Taylor at Building 245, Room C229, National Institute of Standards and Technology, Gaithersburg, MD 20899, or on telephone number 301–975–4220.

Sources: • General Services Administration, Federal Standard 376B, *Preferred Metric Units for General Use by the Federal Government* (Washington, DC, January 27, 1993), pp. 9–11, 13, and 16. National Institute of Standards and Technology, Special Publications 330, 811, and 814. • American National Standards Institute/Institute of Electrical and Electronic Engineers, ANSI/IEEE Std. 268–1992, pp. 28 and 29.

## Table B2. Metric Prefixes

| Unit Multiple | Prefix | Symbol | Unit Multiple | Prefix | Symbol |
|---|---|---|---|---|---|
| $10^{1}$ | deka | da | $10^{-1}$ | deci | d |
| $10^{2}$ | hecto | h | $10^{-2}$ | centi | c |
| $10^{3}$ | kilo | k | $10^{-3}$ | milli | m |
| $10^{6}$ | mega | M | $10^{-6}$ | micro | μ |
| $10^{9}$ | giga | G | $10^{-9}$ | nano | n |
| $10^{12}$ | tera | T | $10^{-12}$ | pico | p |
| $10^{15}$ | peta | P | $10^{-15}$ | femto | f |
| $10^{18}$ | exa | E | $10^{-18}$ | atto | a |
| $10^{21}$ | zetta | Z | $10^{-21}$ | zepto | z |
| $10^{24}$ | yotta | Y | $10^{-24}$ | yocto | y |

Source: U.S. Department of Commerce, National Institute of Standards and Technology, *The International System of Units (SI)*, NIST Special Publication 330, 1991 Edition (Washington, DC, August 1991), p. 10.

## Table B3. Other Physical Conversion Factors

| Energy Source | Original Unit | *multiplied by* | Conversion Factor | *equals* | Final Unit |
|---|---|---|---|---|---|
| **Petroleum** | barrels (bbl) | x | 42[a] | = | U.S. gallons (gal) |
| **Coal** | short tons | x | 2,000[a] | = | pounds (lb) |
| | long tons | x | 2,240[a] | = | pounds (lb) |
| | metric tons (t) | x | 1,000[a] | = | kilograms (kg) |
| **Wood** | cords (cd) | x | 1.25[b] | = | short tons |
| | cords (cd) | x | 128[a] | = | cubic feet ($ft^3$) |

[a]Exact conversion.
[b]Calculated by the Energy Information Administration.
Source: U.S. Department of Commerce, National Institute of Standards and Technology, *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, NIST Handbook 44, 1994 Edition (Washington, DC, October 1993), pp. B-10, C-17, and C-21.

## Appendix C

# Carbon Dioxide Emission Factors for Coal

The need for accurate estimates of carbon dioxide emissions produced during the combustion of coal has led the Energy Information Administration (EIA) to develop basic emission factors. Basic emission factors reflect the carbon-to-heat-content ratio of coal, a ratio which measures carbon dioxide emissions per unit of energy (pounds per million Btu), assuming complete combustion. These basic factors are derived from 5,426 sample analyses maintained in EIA's Coal Analysis File. Variations in the carbon-to-heat-content ratios of different coals were observed to follow coal rank and geographic origin, leading EIA to develop basic emission factors specific to the rank and the State of origin of the coal.

On the basis of these rank- and State-specific basic emission factors for coal, EIA has also developed emission factors by sector. These sectoral emission factors weight the coal consumed in a given sector by its rank and State of origin. Table C1 presents the U.S. average carbon dioxide emission factors for coal by sector. Emission factors differ among sectors and within a given sector over time for a number of reasons:

- A higher average emission factor in the residential and commercial sector can be attributed to the steady consumption of bituminous coal and anthracite (presumably for home heating).
- Virtually all of the coal consumed by coke plants comes from only a few States in the Appalachian Coal Basin (West Virginia, Virginia, and eastern Kentucky). Hence, the emission factors for this sector have remained fairly constant.
- Other industrial users of coal (not coke plants) increased consumption of low-rank, high-emission western coals, which has contributed to a rise in their average emission factor.
- Electric utilities, which account for most U.S. coal consumption, have shifted over time away from high-rank, low-emission bituminous coal to low-rank, high-emission subbituminous coal and lignite as reflected in a gradually rising weighted-average carbon dioxide emission factor.

**Table C1. Average Carbon Dioxide Emission Factors for Coal by Coal-Consuming Sector, 1980-1994**
(Pounds of Carbon Dioxide per Million Btu)

| Year | Residential and Commercial | Industrial | | Electric Utilities | U.S. Average[b] |
|---|---|---|---|---|---|
| | | Coke Plants[a] | Other Coal | | |
| 1980 | 210.6 | 205.8 | 205.9 | 206.7 | 206.5 |
| 1981 | 212.0 | 205.8 | 205.9 | 206.9 | 206.7 |
| 1982 | 210.4 | 205.7 | 206.0 | 207.0 | 206.9 |
| 1983 | 209.2 | 205.5 | 205.9 | 207.1 | 207.0 |
| 1984 | 209.5 | 205.6 | 206.2 | 207.1 | 207.0 |
| 1985 | 209.3 | 205.6 | 206.4 | 207.3 | 207.1 |
| 1986 | 209.2 | 205.4 | 206.5 | 207.3 | 207.1 |
| 1987 | 209.4 | 205.2 | 206.4 | 207.3 | 207.2 |
| 1988 | 209.1 | 205.3 | 206.4 | 207.6 | 207.3 |
| 1989 | 209.7 | 205.3 | 206.6 | 207.5 | 207.3 |
| 1990 | 209.5 | 206.2 | 206.8 | 207.6 | 207.4 |
| 1991 | 210.2 | 206.2 | 206.9 | 207.7 | 207.5 |
| 1992 | 211.2 | 206.2 | 207.1 | 207.7 | 207.6 |
| 1993 | 209.9 | 206.2 | 207.0 | 207.8 | 207.7 |
| 1994 | 209.8 | 206.3 | 207.2 | 207.9 | 207.8 |

[a]No allowances have been made for carbon retained in non-energy coal chemical byproducts from the coal carbonization process.

[b]Weighted average. The weights used are consumption values by sector.

Source: Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

Appendix D

# Energy Units in Perspective

## Using Appendix D

The two tables in this appendix are intended to help the nontechnical reader understand the value of the various energy units used in the *Annual Energy Review*. The values shown here (especially the equivalents in Table D2) are approximations intended to convey a general idea of the magnitude of energy units. The tables can be used to relate a familiar measure of energy, such as gallons, to energy measures used in this report. For example, using information from Table D1, the reader can calculate that 8 gallons of motor gasoline was, on average, about a six-and-a-half-day supply per capita in 1995. Table D2 indicates that 8 gallons of motor gasoline equals about 10 therms of natural gas or approximately 1 million British thermal units (see Glossary).

**Table D1. U.S. Daily Per Capita Consumption of Energy by Type, 1975, 1985, and 1995**

| Type of Energy | Type of Unit | 1975 | 1985 | 1995 | Percent Change 1975-1985 | Percent Change 1985-1995 |
|---|---|---|---|---|---|---|
| Petroleum Products | gallons | 3.2 | 2.8 | 2.8 | -12.9 | 2.2 |
| Motor Gasoline | gallons | 1.3 | 1.2 | 1.2 | -7.7 | 3.3 |
| Natural Gas (dry) | cubic feet | 248 | 198 | 225 | -20.2 | 13.6 |
| Coal | pounds | 14.3 | 18.8 | 19.6 | 31.2 | 4.5 |
| Hydroelectricity | kilowatthours | 3.8 | 3.2 | 3.1 | -15.4 | -5.3 |
| Nuclear Electricity | kilowatthours | 2.2 | 4.4 | 7.0 | 100.5 | 59.2 |
| Total Electricity | kilowatthours | 24.4 | 28.3 | 31.2 | 16.3 | 10.1 |
| Total Energy | thousand Btu | 897 | 849 | 945 | -5.3 | 11.3 |

Note: Percent change is calculated from data prior to rounding.
Sources: Tables 1.5, 2.1, 5.1, 5.11, 6.1, 7.1, 8.3, and B3.

## Table D2. Energy Equivalents

| Unit of Energy | | Energy Equivalent[a] |
|---|---|---|
| 1 Btu of energy | 1 | match tip |
| | 250 | calories (International Steam Table) |
| | 0.25 | kilocalories (food calories) |
| 1 million Btu of energy | 90 | pounds of coal |
| | 8 | gallons of motor gasoline |
| | 10 | therms of dry natural gas |
| | 11 | gallons of propane |
| | 1.1 | days of U.S. energy consumption per capita |
| 1 quadrillion[b] Btu of energy | 45 | million short tons of coal |
| | 60 | million short tons of oven-dried hardwood |
| | 1 | trillion cubic feet of dry natural gas |
| | 170 | million barrels of crude oil |
| | 470 | thousand barrels of crude oil per day for 1 year |
| | 19 | days of U.S. petroleum imports |
| | 24 | days of U.S. motor gasoline use |
| 1 barrel of crude oil | 15 | days of U.S. petroleum consumption per capita |
| | 5.6 | thousand cubic feet of dry natural gas |
| | 0.26 | short tons (520 pounds) of coal |
| | 1.7 | thousand kilowatthours of electricity[c] |
| 1 short ton of coal | 102 | days of U.S. coal consumption per capita |
| | 3.8 | barrels of crude oil |
| | 21 | thousand cubic feet of dry natural gas |
| | 6.5 | thousand kilowatthours of electricity |
| 1,000 cubic feet of natural gas | 4.4 | days of U.S. natural gas consumption per capita |
| | 300 | kilowatthours of electricity[c] |
| 1,000 kilowatthours of electricity | 32 | days of U.S. electricity use per capita |

[a]Equivalents are approximate.
[b]One quadrillion equals 1,000,000,000,000,000.
[c]However, because of net energy losses associated with the generation of electricity, about three times as much fossil fuel is required to generate 1,000 kilowatthours: 1.8 barrels of crude oil, 0.47 short tons of coal, or 10,000 cubic feet of natural gas.

Notes: One million Btu of fossil fuels burned at electric utilities can generate about 100 kilowatthours of electricity, while it takes about 300 kilowatthours of electricity generated at electric utilities to produce 1 million Btu of heat. Calculations are based on 1995 data, where applicable.

Sources: Tables 1.1, 5.11, 6.1, 7.3, 8.1, A1, and D1.

## Appendix E

# Gross Domestic Product and Implicit Price Deflators

**Table E1. Gross Domestic Product and Implicit Price Deflators, 1949–1995**

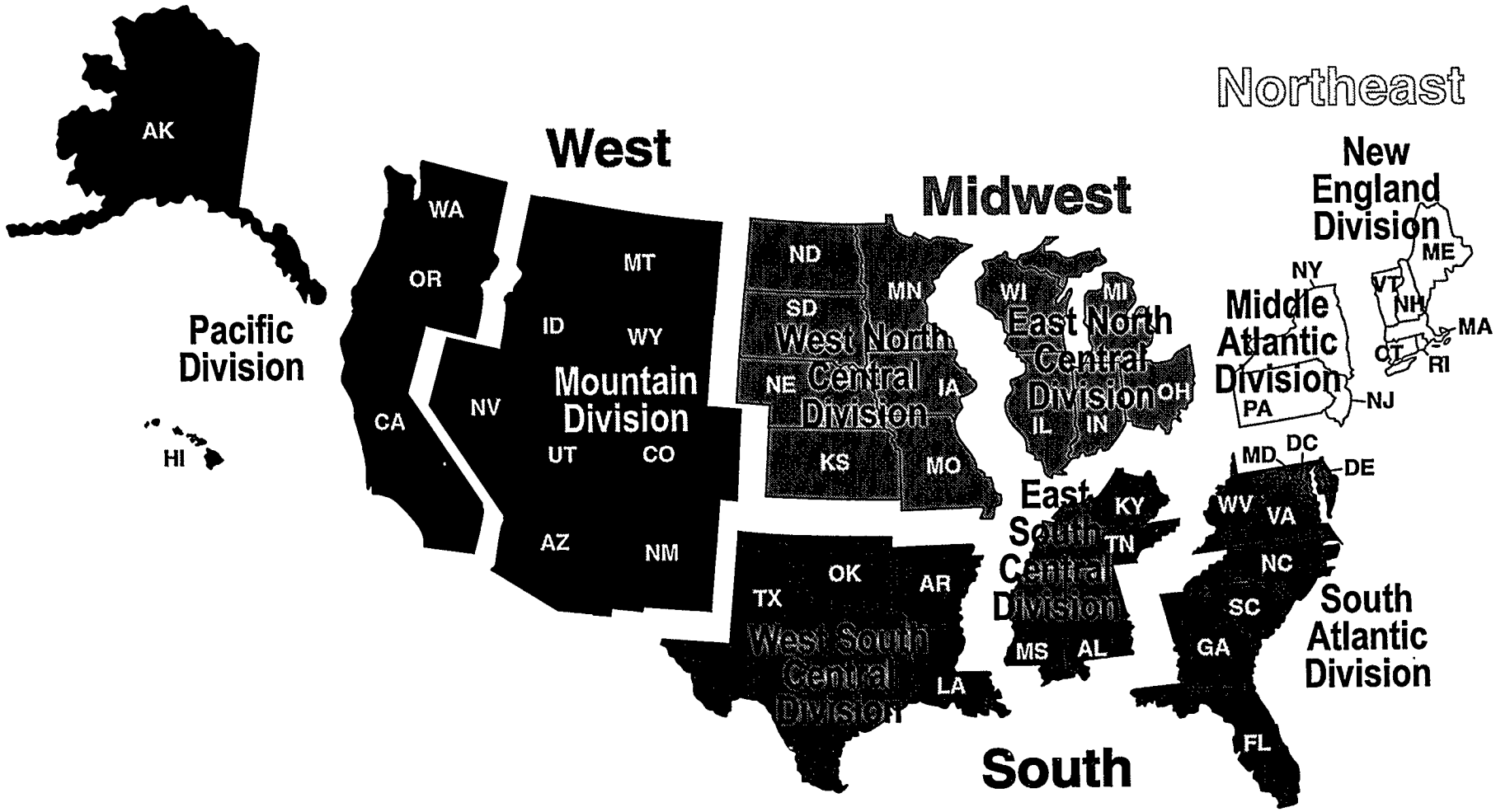
| Years 1949–1972 | Gross Domestic Product (billion chained (1992) dollars) | Implicit Price Deflator (1992=100) | Years 1973–1995 | Gross Domestic Product (billion chained (1992) dollars) | Implicit Price Deflator (1992=100) |
|---|---|---|---|---|---|
| 1949 | (a) | (a) | 1973 | R3,902.3 | R35.4 |
| 1950 | (a) | (a) | 1974 | R3,888.2 | R38.5 |
| 1951 | (a) | (a) | 1975 | R3,865.1 | R42.2 |
| 1952 | (a) | (a) | 1976 | R4,081.1 | R44.6 |
| 1953 | (a) | (a) | 1977 | R4,279.3 | R47.4 |
| 1954 | (a) | (a) | 1978 | R4,493.7 | R51.0 |
| 1955 | (a) | (a) | 1979 | R4,624.0 | R55.3 |
| 1956 | (a) | (a) | 1980 | R4,611.9 | R60.4 |
| 1957 | (a) | (a) | 1981 | R4,724.9 | R65.9 |
| 1958 | (a) | (a) | 1982 | R4,623.6 | R70.1 |
| 1959 | R2,212.3 | R22.9 | 1983 | R4,810.0 | R73.1 |
| 1960 | R2,261.7 | R23.3 | 1984 | R5,138.2 | R75.9 |
| 1961 | R2,309.8 | R23.6 | 1985 | R5,329.5 | R78.4 |
| 1962 | R2,449.1 | R23.9 | 1986 | R5,489.9 | R80.6 |
| 1963 | R2,554.0 | R24.2 | 1987 | R5,648.4 | R83.1 |
| 1964 | R2,702.9 | R24.5 | 1988 | R5,862.9 | R86.1 |
| 1965 | R2,874.8 | R25.0 | 1989 | R6,060.4 | R89.7 |
| 1966 | R3,060.2 | R25.7 | 1990 | R6,138.7 | R93.6 |
| 1967 | R3,140.2 | R26.5 | 1991 | R6,079.0 | R97.3 |
| 1968 | R3,288.6 | R27.7 | 1992 | R6,244.4 | R100.0 |
| 1969 | R3,388.0 | R29.0 | 1993 | R6,383.8 | R102.6 |
| 1970 | R3,388.2 | R30.6 | 1994 | R6,604.2 | R105.0 |
| 1971 | R3,500.1 | R32.2 | 1995 | 6,739.0 | 107.5 |
| 1972 | R3,690.3 | R33.5 | | | |

[a]Data for 1949-1958 were not available in time for publication in this report.
R = Revised data.

Sources: • **Gross Domestic Product:** 1959–1994—U.S. Department of Commerce (DOC), Bureau of Economic Analysis (BEA), *Survey of Current Business*, January/February 1996, "Summary National Income and Product Series, 1959–94" (Washington, DC, February 1996), Table 2. • 1995—DOC, BEA, *United States Department of Commerce News* (Washington, DC, April 2, 1996), Table 2. **Implicit Price Deflators:** • 1959–1994—DOC, BEA, *Survey of Current Business*, January/February 1996, "Summary National Income and Product Series, 1959–94" (Washington, DC, February 1996), Table 3. • 1995—DOC, BEA, *United States Department of Commerce News* (Washington, DC, April 2, 1996), Table 3.

# U.S. Census Regions and Divisions

**Figure 1. U.S. Census Regions and Divisions**




Source: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1995* (Washington, DC, September 1995), Figure 1.

# Glossary

**Account of Others (natural gas):** Natural gas deliveries for the account of others are deliveries to customers by transporters that do not own the natural gas but deliver it for others for a fee. Included are quantities covered by long-term contracts and quantities involved in short-term or spot market sales.

**Additions to Property:** The current year's expenditures on property, plant, and equipment. The amount is predicated upon each reporting company's accounting practices. That is, accounting practices with regard to capitalization of certain items may differ across companies, and, therefore, this figure is a function of each reporting company's policy.

**Alcohol:** The family name of a group of organic chemical compounds composed of carbon, hydrogen, and oxygen. The series of molecules vary in chain length and are composed of a hydrocarbon plus a hydroxyl group; $CH_3$-$(CH_2)_n$-OH (e.g., methanol, ethanol, and tertiary butyl alcohol).

**Anthracite:** A hard, black, lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. Often referred to as hard coal. It conforms to ASTM Specification D388-84 for anthracite, meta-anthracite, and semianthracite.

**API:** The American Petroleum Institute, a trade association.

**API Gravity:** An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API. A lighter, less dense product has a higher API gravity.

**Apparent Consumption, Natural Gas (international):** The total of an individual nation's marketed natural gas production plus imports less exports.

**Apparent Consumption, Petroleum (international):** Consumption which includes internal consumption, refinery fuel and loss, and bunkering. For countries in the Organization for Economic Cooperation and Development (OECD), apparent consumption is derived from refined product output plus refined product imports minus refined product exports plus refined product stock changes plus other oil consumption (such as direct use of crude oil). For countries outside the OECD, apparent consumption is either a reported figure or is derived from refined product output plus refined product imports minus refined product exports, with stock levels assumed to remain the same. Apparent consumption also includes, where available, liquefied petroleum gases sold directly from natural gas processing plants, for fuel or chemical uses.

**Asphalt:** A dark-brown-to-black cement-like material containing bitumens as the predominant constituents. It is obtained by petroleum processing. The definition includes crude asphalt as well as the following finished products: cements, fluxes, the asphalt content of emulsions (exclusive of water), and petroleum distillates blended with asphalt to make cutback asphalts.

**ASTM:** The American Society for Testing and Materials.

**Aviation Gasoline Blending Components:** Naphthas that are used for blending or compounding into finished aviation gasoline (e.g., straight-run gasoline, alkylate, and reformate). Excluded are oxygenates (alcohols, ethers), butane, and pentanes plus.

**Aviation Gasoline, Finished:** All special grades of gasoline for use in aviation reciprocating engines, as given in ASTM Specification D910 and Military Specification MIL-G-5572. Excludes blending components that will be used in blending or compounding into finished aviation gasoline.

**Barrel (petroleum):** A unit of volume equal to 42 U.S. gallons.

**Barrels per Calendar Day (operable refinery capacity):** The maximum number of barrels of input that can be processed during a 24-hour period after making allowances for the following limitations: the capability of downstream facilities to absorb the output of crude oil processing facilities of a given refinery (no reduction is made when a planned distribution of intermediate streams through other than downstream facilities is part of a refinery's normal operation); the types and grades of inputs to be processed; the types and grades of products to be manufactured; the environmental constraints associated with refinery operations; the reduction of capacity for scheduled downtime, such as routine inspection, mechanical problems, maintenance, repairs, and

turnaround; and the reduction of capacity for unscheduled downtime, such as mechanical problems, repairs, and slowdowns.

**Base (Cushion) Gas:** The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

**Biofuels:** Fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.

**Bituminous Coal:** A dense black coal, often with well-defined bands of bright and dull material, with a moisture content usually less than 20 percent. Often referred to as soft coal. It is the most common coal and is used primarily for generating electricity, making coke, and space heating. It conforms to ASTM Specification D388-84 for bituminous coal. In this report, bituminous coal includes subbituminous coal.

**British Thermal Unit (Btu):** The quantity of heat needed to raise the temperature of 1 pound of water by 1° F at or near 39.2° F. (See **Heat Content of a Quantity of Fuel, Gross,** and **Heat Content of a Quantity of Fuel, Net.)**

**Butane:** A normally gaseous straight-chain or branched-chain hydrocarbon ($C_4H_{10}$). It is extracted from natural gas or refinery gas streams. It includes isobutane and normal butane and is designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial butane. *Isobutane:* A normally gaseous branched-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 10.9° F. It is extracted from natural gas or refinery gas streams. *Normal Butane:* A normally gaseous straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of 31.1° F. It is extracted from natural gas or refinery gas streams.

**Butylene:** An olefinic hydrocarbon ($C_4H_8$) recovered from refinery processes.

**Capacity Factor:** The ratio of the electrical energy produced by a generating unit for a given period of time to the electrical energy that could have been produced at continuous full-power operation during the same period.

**Chained Dollars:** A measure used to express real prices. Real prices are those that have been adjusted to remove the effect of changes in the purchasing power of the dollar; they usually reflect buying power relative to a reference year. Prior to 1996, real prices were expressed in constant dollars, a measure based on the weights of goods and services in a single year, usually a recent year. In 1996, the U.S. Department of Commerce introduced the chained-dollar measure. The new measure is based on the average weights of goods and services in successive pairs of years. It is "chained" because the second year in each pair, with its weights, becomes the first year of the next pair. The advantage of using the chained-dollar measure is that it is more closely related to any given period covered and is therefore subject to less distortion over time.

**CIF:** See **Cost, Insurance, Freight.**

**City Gate:** A point or measuring station at which a distribution gas utility receives gas from a natural gas pipeline company or transmission system.

**Class A Electric Utility:** An electric utility having annual electric operating revenues of $2.5 million or more. (Use of this term ceased on December 31, 1983.)

**Class B Electric Utility:** An electric utility having annual electric operating revenues of $1.0 million or more but less than $2.5 million. (Use of this term ceased on December 31, 1983.)

**Coal:** A black or brownish-black solid, combustible substance formed by the partial decomposition of vegetable matter without access to air. The rank of coal, which includes anthracite, bituminous coal, subbituminous coal, and lignite, is based on fixed carbon, volatile matter, and heating value. Coal rank indicates the progressive alteration, or coalification, from lignite to anthracite. Lignite contains approximately 9 to 17 million Btu per ton. The heat contents of subbituminous and bituminous coal range from 16 to 24 million Btu per ton, and from 19 to 30 million Btu per ton, respectively. Anthracite contains approximately 22 to 28 million Btu per ton.

**Coalbed Methane:** Methane that is produced from coalbeds in the same manner as natural gas produced from other strata. Methane is the principal component of natural gas.

**Coal Coke:** A hard, porous product made from baking bituminous coal in ovens at temperatures as high as 2,000° F. It is used both as a fuel and as a reducing agent in smelting iron ore in a blast furnace.

**Cogenerator:** A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, and cooling purposes. See **Nonutility Power Producer.**

**Commercial Building:** A building with more than 50 percent of its floorspace used for commercial activities. Commercial buildings include, but are not limited to, stores, offices, schools, churches, gymnasiums, libraries, museums, hospitals, clinics, warehouses, and jails. Government buildings are included, except buildings on military bases or reservations.

**Commercial Sector:** The commercial sector, as defined economically, consists of business establishments that are not engaged in transportation or in manufacturing or other types of industrial activity (agriculture, mining, or construction). Commercial establishments include hotels, motels, restaurants, wholesale businesses, retail stores, laundries, and other service enterprises; religious and nonprofit organizations; health, social, and educational institutions; and Federal, State, and local governments. Street lights, pumps, bridges, and public services are also included if the establishment operating them is considered commercial. Standard Industrial Classification (SIC) codes used to classify an establishment as commercial are 50 through 87, 89, and 91 through 97.

**Completion:** The installation of permanent equipment for the production of oil or gas. If a well is equipped to produce only oil or gas from one zone or reservoir, the definition of a well (classified as an oil well or gas well) and the definition of a completion are identical. However, if a well is equipped to produce oil and/or gas separately from more than one reservoir, a well is not synonymous with a completion.

**Constant Dollars:** See **Chained Dollars.**

**Conversion Factor:** A number that translates units of one system into corresponding values of another system. Conversion factors can be used to translate physical units of measure for various fuels into Btu equivalents.

**Cost, Insurance, Freight (CIF):** A type of sale in which the buyer of the product agrees to pay a unit price that includes the f.o.b. value of the product at the point of origin, plus all costs of insurance and transportation. This type of transaction differs from a "delivered" purchase in that the buyer accepts the quantity as determined at the loading port (as certified by the Bill of Loading and Quality Report) rather than pay on the basis of the quantity and quality ascertained at the unloading port. It is similar to the terms of an f.o.b. sale, except that the seller, as a service for which he is compensated, arranges for transportation and insurance.

**Crude Oil f.o.b. Price:** The crude oil price actually charged at the oil-producing country's port of loading. Includes deductions for any rebates and discounts or additions of premiums, where applicable. It is the actual price paid with no adjustment for credit terms.

**Crude Oil (Including Lease Condensate):** A mixture of hydrocarbons that exists in liquid phase in underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Included are lease condensate and liquid hydrocarbons produced from tar sands, gilsonite, and oil shale. Drip gases are also included, but topped crude oil (residual oil) and other unfinished oils are excluded. Where identifiable, liquids produced at natural gas processing plants and mixed with crude oil are likewise excluded.

**Crude Oil Landed Cost:** The price of crude oil at the port of discharge, including charges associated with the purchase, transporting, and insuring of a cargo from the purchase point to the port of discharge. The cost does not include charges incurred at the discharge port (e.g., import tariffs or fees, wharfage charges, and demurrage).

**Crude Oil Refinery Input:** The total crude oil put into processing units at refineries.

# Glossary

**Crude Oil Stocks:** Stocks of crude oil and lease condensate held at refineries, in pipelines, at pipeline terminals, and on leases.

**Crude Oil Used Directly:** Crude oil consumed as fuel by crude oil pipelines and on crude oil leases.

**Cubic Foot (natural gas):** A unit of volume equal to 1 cubic foot at a pressure base of 14.73 pounds standard per square inch absolute and a temperature base of 60° F.

**Current Dollars:** See **Nominal Dollars.**

**Degree-Days, Cooling (CDD):** The number of degrees per day that the daily average temperature is above 65° F. The daily average temperature is the mean of the maximum and minimum temperatures for a 24-hour period.

**Degree-Days, Heating (HDD):** The number of degrees per day that the daily average temperature is below 65° F. The daily average temperature is the mean of the maximum and minimum temperatures for a 24-hour period.

**Degree-Days, Population-Weighted:** Heating or cooling degree-days weighted by the population of the area in which the degree-days are recorded. To compute State population-weighted degree-days, each State is divided into from one to nine climatically homogeneous divisions, which are assigned weights based on the ratio of the population of the division to the total population of the State. Degree-day readings for each division are multiplied by the corresponding population weight for each division and those products are then summed to arrive at the State population-weighted degree-day figure. To compute national population-weighted degree-days, the Nation is divided into nine Census regions, each comprising from three to eight States, which are assigned weights based on the ratio of the population of the region to the total population of the Nation. Degree-day readings for each region are multiplied by the corresponding population weight for each region and those products are then summed to arrive at the national population-weighted degree-day figure.

**Demonstrated Reserve Base (coal):** A collective term for the sum of coal in both measured and indicated resource categories of reliability, representing 100 percent of the in-place coal in those categories as of a certain date. Includes beds of bituminous coal and anthracite 28 or more inches thick and beds of subbituminous coal 60 or more inches thick that can occur at depths of up to 1,000 feet. Includes beds of lignite 60 or more inches thick that can be surface mined. Includes also thinner and/or deeper beds that currently are being mined or for which there is evidence that they could be mined commercially at a given time. Represents that portion of the identified coal resource from which reserves are calculated.

**Design Electrical Rating, Net:** The nominal net electrical output of a nuclear unit as specified by the electric utility for the purpose of plant design.

**Development Well:** A well drilled within the proved area of an oil or gas reservoir to the depth of a stratigraphic horizon known to be productive.

**Distillate Fuel Oil:** A general classification for one of the petroleum fractions produced in conventional distillation operations. Included are products known as No. 1, No. 2, and No. 4 fuel oils and No. 1, No. 2, and No. 4 diesel fuels. It is used primarily for space heating, on-and off-highway diesel engine fuel (including railroad engine fuel and fuel for agricultural machinery), and electric power generation.

**Distillation Unit (atmospheric):** The primary distillation unit that processes crude oil (including mixtures of other hydrocarbons) at approximately atmospheric conditions. It includes a pipe still for vaporizing the crude oil and a fractionation tower for separating the vaporized hydrocarbon components in the crude oil into fractions with different boiling ranges. This is done by continuously vaporizing and condensing the components to separate higher boiling point material. The selected boiling ranges are set by the processing scheme, the properties of the crude oil, and the product specifications.

**District Heat:** Steam or hot water from an outside source used as an energy source in a building. The steam or hot water is produced in a central plant and piped into the building. The district heat may be purchased from a utility or provided by a physical plant in a separate

building that is part of the same facility (for example, a hospital complex or university).

**Dry Hole:** An exploratory or development well found to be incapable of producing either oil or gas in sufficient quantities to justify completion as an oil or gas well.

**Dry Natural Gas Production (as a decrement from gas reserves):** The volume of natural gas withdrawn from reservoirs during the report year less (1) the volume returned to such reservoirs in cycling, repressuring of oil reservoirs, and conservation operations; (2) shrinkage resulting from the removal of lease condensate and plant liquids; and (3) nonhydrocarbon gases, where they occur in sufficient quantity to render the gas unmarketable. Volumes of gas withdrawn from gas storage reservoirs and native gas that has been transferred to the storage category are not considered in production. This is not the same as marketed production, since the latter also excludes vented and flared gas but contains liquids.

**Dry Natural Gas Production (as an increment to gas supply):** Gross withdrawals from production reservoirs less gas used in reservoir repressuring, amounts vented and flared, nonhydrocarbons removed, and various natural gas constituents, such as ethane, propane, and butane, removed at natural gas processing plants. The parameters for measurement are 60° F and 14.73 pounds standard per square inch absolute.

**Electrical System Energy Losses:** The amount of energy lost during generation, transmission, and distribution of electricity, including plant and unaccounted-for uses.

**Electricity Generation:** The process of producing electric energy or transforming other forms of energy into electric energy. Also, the amount of electric energy produced or expressed in watthours (Wh).

**Electricity Generation, Gross:** The total amount of electric energy produced by a generating facility, as measured at the generator terminals.

**Electricity Generation, Net:** Gross generation minus plant use from all electric utility-owned plants. The energy required for pumping at a pumped-storage hydroelectric plant is regarded as plant use and must be deducted from the gross generation.

**Electricity Production:** Net electricity (gross electricity output measured at generator terminals minus power plant use) generated by publicly and privately owned electric utilities. Excludes industrial electricity generation (except autogeneration of hydroelectric power).

**Electricity Sales:** The amount of kilowatthours sold in a given period of time; usually grouped by classes of service, such as residential, commercial, industrial, and other. "Other" sales include sales for public street and highway lighting and other sales to public authorities and railways, and interdepartmental sales.

**Electric Power Plant:** A station containing prime movers, electric generators, and auxiliary equipment for converting mechanical, chemical, and/or fission energy into electric energy.

**Electric Utilities:** All privately owned companies and all publicly owned agencies engaged in the generation, transmission, or distribution of electric power for public use. Publicly owned agencies include municipal electric utilities; Federal power projects, such as the Tennessee Valley Authority (TVA); rural electrification cooperatives; power districts; and State power projects.

**Electric Utility:** A corporation, person, agency, authority, or other legal entity or instrumentality that owns and/or operates facilities within the United States, its territories, or Puerto Rico for the generation, transmission, distribution, or sale of electric energy, primarily for use by the public, and that files forms listed in the *Code of Federal Regulations*, Title 18, Part 141. Facilities that qualify as cogenerators or small power producers under the Public Utility Regulatory Policies Act are not considered electric utilities.

**Electric Utility Sector:** The electric utility sector consists of privately and publicly owned establishments that generate, transmit, distribute, or sell electricity primarily for use by the public and that meet the definition of an electric utility. Nonutility power producers are not included in the electric utility sector.

# Glossary

**Eliminations:** Revenues and expenses resulting from transactions between segments. Consolidated company accounts do not include intersegment revenues and expenses. Therefore, such intersegment transactions must be eliminated.

**End-Use Sectors:** The residential, commercial, industrial, and transportation sectors of the economy.

**Energy:** The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatthours, while heat energy is usually measured in British thermal units.

**Energy Consumption:** The use of energy as a source of heat or power or as an input in the manufacturing process.

**Energy Consumption, End-Use:** The sum of fossil fuel consumption by the four end-use sectors (residential, commercial, industrial, and transportation) plus electric utility sales to those sectors and generation of hydroelectric power by nonelectric utilities. Net end-use energy consumption excludes electrical system energy losses. Total end-use energy consumption includes electrical system energy losses.

**Energy Consumption, Total:** The sum of fossil fuel consumed by the five sectors (residential, commercial, industrial, transportation, and electric utility) plus hydroelectric power, nuclear electric power, net imports of coal coke, and electricity generated for distribution from wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

**Energy Expenditures:** The money directly spent by consumers to purchase energy. Expenditures equal the amount of energy used by the consumer times the price per unit paid by the consumer.

**Energy Source:** A substance, such as petroleum, natural gas, or coal, that supplies heat or power. In Energy Information Administration (EIA) reports, electricity and renewable forms of energy, such as biomass, geothermal, wind, and solar, are considered to be energy sources.

**Energy-Weighted Industrial Output:** The weighted sum of real output for all two-digit Standard Industrial Classification (SIC) manufacturing industries, plus agriculture, construction, and mining. The weight for each industry is the ratio of the quantity of end-use energy consumption to the value of real output. The base year for those weights is either 1981 or 1982, depending on data availability.

**Ethane:** A normally gaseous straight-chain hydrocarbon ($C_2H_6$). It is a colorless, paraffinic gas that boils at a temperature of -127.48° F. It is extracted from natural gas and refinery gas streams.

**Ethylene:** An olefinic hydrocarbon ($C_2H_4$) recovered from refinery processes or petrochemical processes.

**Exploratory Well:** A well drilled to find and produce oil or gas in an unproved area, to find a new reservoir in a field previously found to be productive of oil or gas in another reservoir, or to extend the limit of a known oil or gas reservoir.

**Exports:** Shipments of goods from the 50 States and the District of Columbia to foreign countries and to Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

**Extraction Loss:** The reduction in volume of natural gas due to the removal of natural gas constituents, such as ethane, propane, and butane, at natural gas processing plants.

**f.a.s.:** See **Free Alongside Ship.**

**Federal Energy Regulatory Commission (FERC):** The Federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy and is the successor to the Federal Power Commission.

**Federal Power Commission (FPC):** The predecessor agency of the Federal Energy Regulatory Commission. The Federal Power Commission was created by an Act of Congress under the Federal Water Power Act on June 10, 1920. It was charged originally with regulating the electric power and natural gas industries. It was abolished on September 30, 1977, when the Department of Energy was created. Its functions were divided between the Department of Energy and the Federal Energy Regulatory Commission, an independent regulatory agency.

**First Purchase Price:** The marketed first sales price of domestic crude oil, consistent with the removal price defined by the provisions of the Windfall Profits Tax on Domestic Crude Oil (Public Law 96-223, Sec. 4998 [c]).

**Fiscal Year:** The U.S. Government's fiscal year runs from October 1 through September 30. The fiscal year is designated by the calendar year in which it ends; e.g., fiscal year 1992 begins on October 1, 1991, and ends on September 30, 1992.

**Flared Natural Gas:** Natural gas burned in flares on the base site or at gas processing plants.

**Floorspace:** All the area enclosed by the exterior walls of a building, including indoor parking facilities, basements, hallways, lobbies, stairways, and elevator shafts. For aggregate floorspace statistics, square footage was summed or aggregated over all buildings in a category (such as all office buildings in the United States).

**f.o.b.:** See **Free on Board.**

**Former U.S.S.R.:** See **U.S.S.R.**

**Footage Drilled:** Total footage for wells in various categories, as reported for any specified period, includes (1) the deepest total depth (length of well bores) of all wells drilled from the surface, (2) the total of all bypassed footage drilled in connection with reported wells, and (3) all new footage drilled for directional sidetrack wells. Footage reported for directional sidetrack wells does not include footage in the common bore, which is reported as footage for the original well. In the case of old wells drilled deeper, the reported footage is that which was drilled below the total depth of the old well.

**Forward Costs:** The operating and capital costs still to be incurred in the production of uranium from estimated reserves; such costs are used in assigning the uranium reserves to cost categories. Those costs include labor, materials, power and fuel, royalties, payroll and production taxes, insurance, and applicable general and administrative costs. They exclude expenditures prior to reserve estimates, for example, for property acquisition, exploration, mine development, and mill construction from the forward cost determinations, as well as income taxes, profit, and the cost of money. Forward costs are neither the full costs of production nor the market price at which the uranium will be sold.

**Fossil Fuel:** Any naturally occurring organic fuel formed in the Earth's crust, such as petroleum, coal, and natural gas.

**Fossil Fuel Steam-Electric Power Plant:** An electricity generation plant in which the prime mover is a turbine rotated by high-pressure steam produced in a boiler by heat from burning fossil fuels.

**Free Alongside Ship (f.a.s.):** The value of a commodity at the port of exportation, generally including the purchase price, plus all charges incurred in placing the commodity alongside the carrier at the port of exportation.

**Free on Board (f.o.b.):** A transaction whereby the seller makes the product available within an agreed-on period at a given port at a given price. It is the responsibility of the buyer to arrange for the transportation and insurance.

**Fuel Ethanol:** An anhydrous, denatured aliphatic alcohol ($C_2H_5OH$) intended for motor gasoline blending. See **Oxygenates.**

**Fuel-Switching Capability:** The short-term capability of a manufacturing establishment to have used substitute energy sources in place of those actually consumed. Capability to use substitute energy sources means that the establishment's combustors (for example, boilers, furnaces, ovens, and blast furnaces) had the machinery or equipment either in place or available for installation so that

substitutions could actually have been introduced within 30 days without extensive modifications. Fuel-switching capability does not depend on the relative prices of energy sources; it depends only on the characteristics of the equipment and certain legal constraints.

**Full-Power Operation**: Operation of a nuclear generating unit at 100 percent of its design capacity. Full-power operation precedes commercial operation.

**Gasohol:** A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol) limited to 10 percent by volume of alcohol. Gasohol is included in finished leaded and unleaded motor gasoline.

**Gas-Turbine Electric Power Plant:** A plant in which the prime mover is a gas turbine. A gas turbine typically consists of an axial-flow air compressor and one or more combustion chambers where liquid or gaseous fuel is burned. The hot gases expand to drive the generator and then are used to run the compressor.

**Gas Well:** A well completed for the production of natural gas from one or more gas zones or reservoirs. (Wells producing both crude oil and natural gas are classified as oil wells.)

**Gas Well Productivity:** Derived annually by dividing gross natural gas withdrawals from gas wells by the number of producing gas wells on December 31 and then dividing the quotient by the number of days in the year.

**Geothermal Energy:** Energy from the internal heat of the Earth, which may be residual heat, friction heat, or a result of radioactive decay. The heat is found in rocks and fluids at various depths and can be extracted by drilling and/or pumping.

**Geothermal Energy (as used at electric utilities):** Hot water or steam, extracted from geothermal reservoirs in the Earth's crust, and supplied to steam turbines at electric utilities that drive generators to produce electricity.

**Gross Domestic Product (GDP):** The total value of goods and services produced by labor and property located in the United States. As long as the labor and property are located in the United States, the supplier (that is, the workers and, for property, the owners) may be either U.S. residents or residents of foreign countries.

**Gross Domestic Product (GDP) Implicit Price Deflator:** A measure used to convert nominal prices to real prices. See **Chained Dollars.**

**Gross Electricity Generation:** See **Electricity Generation, Gross.**

**Gross Input to Atmospheric Crude Oil Distillation Units:** Total input to atmospheric crude oil distillation units. Includes all crude oil, lease condensate, natural gas plant liquids, unfinished oils, liquefied refinery gases, slop oils, and other liquid hydrocarbons produced from tar sands, gilsonite, and oil shale.

**Heat Content of a Quantity of Fuel, Gross:** The total amount of heat released when a fuel is burned. Coal, crude oil, and natural gas all include chemical compounds of carbon and hydrogen. When those fuels are burned, the carbon and hydrogen combine with oxygen in the air to produce carbon dioxide and water. Some of the energy released in burning goes into transforming the water into steam and is usually lost. The amount of heat spent in transforming the water into steam is counted as part of gross heat content but is not counted as part of net content. Also referred to as the higher heating value. Btu conversion factors typically used by EIA represent gross heat content.

**Heat Content of a Quantity of Fuel, Net:** The amount of usable heat energy released when a fuel is burned under conditions similar to those in which it is normally used. Also referred to as the lower heating value. Btu conversion factors typically used by EIA represent gross heat content.

**Heavy Oil:** The fuel oils remaining after the lighter oils have been distilled off during the refining process. Except for start-up and flame stabilization, virtually all petroleum used in steam-electric power plants is heavy oil.

**Household**: A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. Occupy means the housing unit was the person's usual or permanent place of residence.

The household includes babies, lodgers, boarders, employed persons who live in the housing unit, and persons who usually live in the household but are away traveling or in a hospital. The household does not include persons who are normally members of the household but who are away from home as college students or members of the armed forces. The household does not include persons temporarily visiting with the household if they have a place of residence elsewhere, persons who take their meals with the household but usually lodge or sleep elsewhere, domestic employees or other persons employed by the household who do not sleep in the same housing unit, or persons who are former members of the household, but have since become inmates of correctional or penal institutions, mental institutions, homes for the aged or needy, homes or hospitals for the chronically ill or handicapped, nursing homes, convents or monasteries, or other places in which residents may remain for long periods of time. By definition, the number of households is the same as the number of occupied housing units.

**Housing Unit:** A structure or part of a structure where a household lives. It has access from the outside of the building either directly or through a common hall. Housing units do not include group quarters, such as prisons or nursing homes where 10 or more unrelated persons live. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence.

**Hydrocarbon:** An organic chemical compound of hydrogen and carbon in the gaseous, liquid, or solid phase. The molecular structure of hydrocarbon compounds varies from the simplest (methane, a constituent of natural gas) to the very heavy and very complex.

**Hydroelectric Power:** The production of electricity from the kinetic energy of falling water.

**Hydroelectric Power Plant:** A plant in which the turbine generators are driven by falling water.

**Implicit Price Deflator:** See **Gross Domestic Product (GDP) Implicit Price Deflator.**

**Imports:** Receipts of goods into the 50 States and the District of Columbia from foreign countries and from Puerto Rico, the Virgin Islands, and other U.S. possessions and territories.

**Independent Power Producer:** Wholesale electricity producers (other than qualifying facilities under the Public Utilities Regulatory Policies Act of 1978) that are unaffiliated with franchised utilities in the area in which the independent power producers are selling power and that lack significant marketing power. Unlike traditional electric utilities, independent power producers do not possess transmission facilities that are essential to their customers and do not sell power in any retail service territory where they have a franchise. See **Nonutility Power Producer.**

**Indicated Resources, Coal:** Coal for which estimates of the rank, quality, and quantity are based partly on sample analyses and measurements and partly on reasonable geologic projections. Indicated resources are computed partly from specified measurements and partly from projection of visible data for a reasonable distance on the basis of geologic evidence. The points of observation are 1/2 to 1-1/2 miles apart. Indicated coal is projected to extend as a 1/2-mile-wide belt that lies more than 1/4 mile from the outcrop or points of observation or measurement.

**Industrial Sector:** The industrial sector comprises manufacturing industries which make up the largest part of the sector along with mining, construction, agriculture, fisheries, and forestry. Establishments in this sector range from steel mills, to small farms, to companies assembling electronic components. The SIC codes used to classify establishments as industrial are 1 through 39.

**Internal Combustion Electric Power Plant:** A power plant in which the prime mover is an internal combustion engine. Diesel or gas-fired engines are the principal types used in electric power plants. The plant is usually operated during periods of high demand for electricity.

**International Bunkers:** Storage compartments, found on vessels and aircraft engaged in international commerce, where fuel to be used by the vessel or aircraft is stored.

**Jet Fuel:** The term includes kerosene-type jet fuel and naphtha-type jet fuel. Kerosene-type jet fuel is a kerosene-quality product used primarily for commercial turbojet and turboprop aircraft engines. Naphtha-type jet fuel is a fuel in the heavy naphthas range used primarily for military turbojet and turboprop aircraft engines.

**Kerosene:** A petroleum distillate that has a maximum distillation temperature of 401° F at the 10-percent recovery point, a final boiling point of 572° F, and a minimum flash point of 100° F. Included are the two grades designated in ASTM D3699 (No. 1-K and No. 2-K) and all grades of kerosene called range or stove oil. Kerosene is used in space heaters, cook stoves, and water heaters; it is suitable for use as an illuminant when burned in wick lamps.

**Lease and Plant Fuel:** Natural gas used in well, field, and lease operations (such as gas used in drilling operations, heaters, dehydrators, and field compressors), and as fuel in natural gas processing plants.

**Lease Condensate:** A natural gas liquid recovered from gas well gas (associated and non-associated) in lease separators or natural gas field facilities. Lease condensate consists primarily of pentanes and heavier hydrocarbons.

**Light Oil:** Lighter fuel oils distilled off during the refining process. Virtually all petroleum used in internal combustion and gas-turbine engines is light oil.

**Lignite:** A brownish-black coal of low rank with a high content of moisture and volatile matter. Often referred to as brown coal. It is used almost exclusively for electric power generation. It conforms to ASTM Specification D388-84 for lignite.

**Line-Miles of Seismic Exploration:** The distance along the Earth's surface that is covered by seismic surveying.

**Liquefied Natural Gas (LNG):** Natural gas (primarily methane) that has been liquefied by reducing its temperature to -260° F at atmospheric pressure.

**Liquefied Petroleum Gases (LPG):** Ethane, ethylene, propane, propylene, normal butane, butylene, and isobutane produced at refineries or natural gas processing plants, including plants that fractionate new natural gas plant liquids.

**Liquefied Refinery Gases (LRG):** Liquefied petroleum gases fractionated from refinery or still gases. Through compression and/or refrigeration, they are retained in the liquid state. The reported categories are ethane/ethylene, propane/propylene, normal butane/butylene, and isobutane. Excludes still gas.

**Low-Power Testing:** The period of time between a nuclear generating unit's initial fuel loading date and the issuance of its operating (full-power) license. The maximum level of operation during that period is 5 percent of the unit's design thermal rating.

**Lubricants:** Substances used to reduce friction between bearing surfaces or as process materials either incorporated into other materials used as processing aids in the manufacturing of other products or as carriers of other materials. Petroleum lubricants may be produced either from distillates or residues. Other substances may be added to impart or improve certain required properties. Excluded are byproducts of lubricating oil refining, such as aromatic extracts derived from solvent extraction or tars derived from deasphalting. Lubricants include all grades of lubricating oils from spindle oil to cylinder oil and those used in greases. Lubricant categories include paraffinic and naphthenic.

**Main Cooking Fuel:** Fuel most often used for cooking.

**Main Heating Equipment:** Equipment used primarily for heating ambient air in a housing unit.

**Main Heating Fuel:** Fuel that powers the main heating equipment.

**Major Electric Utility:** A utility that, in the last 3 consecutive calendar years, had sales or transmission services exceeding one of the following: (1) 1 million megawatthours of total annual sales; (2) 100 megawatthours of annual sales for resale; (3) 500 megawatthours of annual gross interchange out; or (4) 500 megawatthours of wheeling (deliveries plus losses) for others.

**Major Fuels:** The energy sources or fuels for which consumption and expenditure data were collected on the 1986 Nonresidential Building Energy Consumption Survey. Those fuels or energy sources are as follows: electricity, fuel oil, liquefied petroleum gases, natural gas, district steam, district hot water, and district chilled water.

**Manufacturing Establishment:** An economic unit at a single physical location where the mechanical or chemical transformation of materials or substances into new products is performed. Those operations are generally conducted in facilities described as plants, factories, or mills and characteristically use power-driven machines and material handling equipment. In addition, the assembly of components of manufactured products is considered manufacturing, as is the blending of materials, such as lubricating oil, plastics, resins, or liquors. Manufacturing establishments are covered by SIC codes 20 through 39.

**Manufacturing Sector:** The universe of manufacturing establishments within the 50 States and the District of Columbia.

**Measured Resources, Coal:** Coal resources for which estimates of the rank, quality, and quantity have been computed, within a margin of error of less than 20 percent, from sample analyses and measurements from closely spaced and geologically well known sample sites. Measured resources are computed from dimensions revealed in outcrops, trenches, mine workings, and drill holes. The points of observation and measurement are so closely spaced and the thickness and extent of coals are so well defined that the tonnage is judged to be accurate within 20 percent. Although the spacing of the point of observation necessary to demonstrate continuity of the coal differs from region to region, according to the character of the coalbeds, the points of observation are no greater than 1/2 mile apart. Measured coal is projected to extend as a belt 1/4 mile wide from the outcrop or points of observation or measurement.

**Metallurgical Coal:** Coal that meets the requirements for making coke. It must be low in ash and sulfur and form a coke that is capable of supporting the charge of iron ore and limestone in a blast furnace. A blend of two or more bituminous coals is usually required to make coke.

**Methanol:** A light, volatile alcohol ($CH_3OH$) eligible for motor gasoline blending. See **Oxygenates.**

**Metropolitan:** Refers to buildings located within Metropolitan Statistical Areas (MSA's) as defined in the 1980 Census. Except in New England, an MSA is a county or a group of contiguous counties that contains at least one city of 50,000 inhabitants or more, or twin cities with a combined population of 50,000 or more. The contiguous counties are included in an MSA if they are essentially metropolitan in character and are socially and economically integrated with the central city. In New England, MSA's consist of towns and cities rather than counties.

**Miscellaneous Petroleum Products:** All finished petroleum products not classified elsewhere, for example, petrolatum, lube refining byproducts (aromatic extracts and tars), absorption oils, ram-jet fuel, petroleum rocket fuels, synthetic natural gas feedstocks, and specialty oils.

**Motor Gasoline:** A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, obtained by blending appropriate refinery streams to form a fuel suitable for use in spark-ignition engines. Motor gasoline includes both leaded and unleaded grades of finished motor gasoline, blending components, and gasohol.

**Motor Gasoline Blending Components:** Naphthas that will be used for blending or compounding into finished motor gasoline (e.g., straight-run gasoline, alkylate, reformate, benzene, toluene, and xylene). Excluded are oxygenates (alcohols and ethers), butane, and pentanes plus.

**Motor Gasoline, Finished:** A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that has been blended to form a fuel suitable for use in spark-ignition engines. Motor gasoline, as given in ASTM Specification D439 or Federal Specification VV-G-1690B, includes a range in distillation temperatures from 122° to 158° F at the 10-percent recovery point and from 365° to 374° F at the 90-percent recovery point. Motor gasoline includes reformulated motor gasoline, oxygenated motor

gasoline (Environmental Protection Agency [EPA] approved), and other finished motor gasoline. Blendstock is excluded until blending has been completed.

- *Reformulated Motor Gasoline:* Motor gasoline, formulated for use in motor vehicles, the composition and properties of which are certified as "reformulated motor gasoline" by the EPA.
- *Oxygenated Motor Gasoline (EPA Approved):* Motor gasoline, formulated for use in motor vehicles, that is intended for use in the EPA carbon monoxide nonattainment program. Reformulated motor gasoline is excluded.
- *Other Finished:* Motor gasoline that is not included in the reformulated or oxygenated categories.

**Motor Gasoline, Finished Gasohol:** A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol, but sometimes methanol) in which 10 percent or more of the product is alcohol.

**Motor Gasoline, Finished Leaded:** Motor gasoline that contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes leaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

**Motor Gasoline, Finished Leaded Premium:** Motor gasoline having an antiknock index, calculated as (R+M)/2, greater than 90 and containing more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon.

**Motor Gasoline, Finished Leaded Regular:** Motor gasoline having an antiknock index, calculated as (R+M)/2 greater than or equal to 87 and less than or equal to 90 and containing more than 0.05 gram of lead or 0.005 gram of phosphorus per gallon.

**Motor Gasoline, Finished Unleaded:** Motor gasoline containing not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating. Includes unleaded gasohol. Blendstock is excluded until blending has been completed. Alcohol that is to be used in the blending of gasohol is also excluded.

**Motor Gasoline, Finished Unleaded Midgrade:** Motor gasoline having an antiknock index calculated as (R+M)/2, greater than or equal to 88 and less than or equal to 90 and containing not more than 0.05 gram of phosphorus per gallon.

**Motor Gasoline, Finished Unleaded Premium:** Motor gasoline having an antiknock index calculated as (R+M)/2, greater than 90 and containing not more than 0.05 gram of lead or 0.005 gram of phosphorus per gallon.

**Motor Gasoline, Finished Unleaded Regular:** Motor gasoline having an antiknock index, calculated as (R+M)/2, of 87 and containing not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon.

**Motor Gasoline, Leaded:** Motor gasoline that contains more than 0.05 gram of lead per gallon or more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included.

**Motor Gasoline Retail Prices:** Motor gasoline prices calculated each month by the Bureau of Labor Statistics (BLS) in conjunction with the construction of the Consumer Price Index (CPI). Those prices are collected in 85 urban areas selected to represent all urban consumers—about 80 percent of the total U.S. population. The service stations are selected initially, and on a replacement basis, in such a way that they represent the purchasing habits of the CPI population. Service stations in the current sample include those providing all types of service (i.e., full-, mini-, and self-service).

**Motor Gasoline, Total:** Includes finished leaded motor gasoline (premium and regular), finished unleaded motor gasoline (premium, midgrade, and regular), motor gasoline blending components, and gasohol.

**Motor Gasoline, Unleaded:** Gasoline that contains not more than 0.05 gram of lead per gallon and not more than 0.005 gram of phosphorus per gallon. Premium and regular grades are included, depending on the octane rating.

**MTBE (Methyl Tertiary Butyl Ether):** An ether, $(CH_3)_3COCH_3$, intended for motor gasoline blending. See **Oxygenates.**

**Naphtha:** A generic term applied to a petroleum fraction with an approximate boiling range between 122° and 400° F.

**Native Gas:** The total volume of natural gas indigenous to the storage reservoir at the time the storage started.

**Natural Gas:** A mixture of hydrocarbons (principally methane) and small quantities of various nonhydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs.

**Natural Gas, Dry:** The marketable portion of natural gas production, which is obtained by subtracting extraction losses, including natural gas liquids removed at natural gas processing plants, from total production.

**Natural Gas Gross Withdrawals:** Full well stream volume of produced natural gas, excluding condensate separated at the lease.

**Natural Gas Liquids (NGL):** Those hydrocarbons in natural gas that are separated as liquids from the gas. Natural gas liquids include natural gas plant liquids (primarily ethane, propane, butane, and isobutane), and lease condensate (primarily pentanes produced from natural gas at lease separators and field facilities.)

**Natural Gas Marketed Production:** Gross withdrawals of natural gas from production reservoirs, less gas used for reservoir repressuring; nonhydrocarbon gases removed in treating and processing operations; and quantities vented and flared.

**Natural Gas Plant Liquids (NGPL):** Natural gas liquids recovered from natural gas in processing plants and, in some situations, from natural gas field facilities, as well as those extracted by fractionators. Natural gas plant liquids are defined according to the published specifications of the Gas Processors Association and the American Society for Testing and Materials as follows: ethane, propane, normal butane, isobutane, pentanes plus, and other products from natural gas processing plants (i.e., products meeting the standards for finished petroleum products produced at natural gas processing plants, such as finished motor gasoline, finished aviation gasoline, special naphthas, kerosene, distillate fuel oil, and miscellaneous products).

**Natural Gas Wellhead Price:** The wellhead price of natural gas is calculated by dividing the total reported value at the wellhead by the total quantity produced as reported by the appropriate agencies of individual producing States and the U.S. Minerals Management Service. The price includes all costs prior to shipment from the lease, including gathering and compression costs, in addition to State production, severance, and similar charges.

**Natural Gas, Wet:** Natural gas prior to the extraction of liquids and other miscellaneous products.

**NERC:** See **North American Electric Reliability Council.**

**Net Electricity Generation:** See **Electricity Generation, Net.**

**Net Income:** Operating income plus earnings from unconsolidated affiliates; gains from disposition of property, plant, and equipment; minority interest income; and foreign currency translation effects less income taxes, extraordinary items, and the cumulative effect of accounting changes.

**Net Ownership Interest:** The sum of net working interest and royalty interest. Net ownership interest applies to both production and reserves.

**Net Property Investment**: The original cost of property, plant, and equipment (PP&E), less accumulated depreciation.

**Net Summer Capability:** The steady hourly output that generating equipment is expected to supply to system load, exclusive of auxiliary power, as demonstrated by testing at the time of summer peak demand.

**Net Working Interest:** A company's working interest, not including any basic royalty or overriding royalty interests.

**Nominal Dollars:** A measure used to express nominal prices.

**Nominal Price:** The price paid for goods or services at the time of the transaction. Nominal prices are those that have not been adjusted to remove the effect of changes in the purchasing power of

the dollar; they reflect buying power in the year in which the transaction occurred.

**Nonhydrocarbon Gases:** Typical nonhydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

**Nonmetropolitan:** Refers to buildings not located within Metropolitan Statistical Areas as defined in the 1980 Census.

**Nontraceables:** Those revenues, costs, assays, and liabilities that cannot be directly attributed to a type of business by use of a reasonable allocation method developed on the basis of operating-level utilities.

**Nonutility Power Producer:** A corporation, person, agency, authority, or other legal entity or instrumentality that owns electric generating capacity and is not an electric utility. Nonutility power producers include qualifying cogenerators, qualifying small power producers, and other nonutility generators (including independent power producers) without a designated, franchised service area that do not file forms listed in the *Code of Federal Regulations*, Title 18, Part 141. See **Cogenerator; Independent Power Producer; and Small Power Producer.**

**North American Electric Reliability Council (NERC):** A council formed in 1968 by the electric utility industry to promote the reliability and adequacy of bulk power supply in the electric utility systems of North America. The NERC consists of nine regional reliability councils and encompasses essentially all the power systems of the contiguous United States and Canada. The NERC regions are as follows: (1) East Central Area Reliability Coordination Agreement (ECAR); (2) Electric Reliability Council of Texas (ERCOT); (3) Mid-America Interpol Network (MAIN); (4) Mid-Atlantic Area Council (MAAC); (5) Mid-Continent Area Power Pool (MAPP); (6) Northeast Power Coordinating Council (NPCC); (7) Southeastern Electric Reliability Council (SERC); (8) Southwest Power Pool (SPP); and (9) Western Systems Coordinating Council (WSCC).

**Nuclear Electric Power:** Electricity generated by an electric power plant whose turbines are driven by steam generated in a reactor by heat from the fissioning of nuclear fuel.

**Nuclear Electric Power Plant:** A single-unit or multi-unit facility in which heat produced in one or more reactors by the fissioning of nuclear fuel is used to drive one or more steam turbines.

**Nuclear Reactor:** An apparatus in which the nuclear fission chain can be initiated, maintained, and controlled so that energy is released at a specific rate. The reactor includes fissionable material (fuel), such as uranium or plutonium; fertile material; moderating material (unless it is a fast reactor); a heavy-walled pressure vessel; shielding to protect personnel; provision for heat removal; and control elements and instrumentation.

**Offshore:** That geographic area that lies seaward of the coastline. In general, the coastline is the line of ordinary low water along with that portion of the coast that is in direct contact with the open sea or the line marking the seaward limit of inland water.

**Oil:** See **Crude Oil (Including Lease Condensate).**

**Oil Well:** A well completed for the production of crude oil from one or more oil zones or reservoirs. Wells producing both crude oil and natural gas are classified as oil wells.

**Operable (nuclear):** A U.S. nuclear generating unit is considered operable after it completes low-power testing and is issued a full-power operating license by the Nuclear Regulatory Commission. A foreign nuclear generating unit is considered operable once it has generated electricity to the grid.

**Operable Refineries:** Refineries that were in one of the following three categories at the beginning of a given year: in operation; not in operation and not under active repair, but capable of being placed into operation within 30 days; or not in operation, but under active repair that could be completed within 90 days.

**Operating Income:** Operating revenues less operating expenses. Excludes items of other revenue and expense, such as equity in earnings of

unconsolidated affiliates, dividends, interest income and expense, income taxes, extraordinary items, and cumulative effect of accounting changes.

**Organization for Economic Cooperation and Development (OECD):** Current members are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States and its territories (Guam, Puerto Rico, and the Virgin Islands).

**Organization of Petroleum Exporting Countries (OPEC):** Countries that have organized for the purpose of negotiating with oil companies on matters of oil production, prices, and future concession rights. Current members are Algeria, Gabon, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

**Other Hydrocarbons (petroleum):** Other materials processed at refineries. Includes coal tar derivatives, hydrogen, gilsonite, and natural gas received by the refinery for reforming into hydrogen.

**Oxygenated Motor Gasoline:** See **Motor Gasoline, Finished.**

**Oxygenates:** Any substance which, when added to motor gasoline, increases the amount of oxygen in that motor gasoline blend. Through a series of waivers and interpretive rules, the Environmental Protection Agency (EPA) has determined the allowable limits for oxygenates in unleaded gasoline. The "Substantially Similar" Interpretive Rules (56 FR [February 11, 1991]) allows blends of aliphatic alcohols other than methanol and aliphatic ethers, provided the oxygen content does not exceed 2.7 percent by weight. The "Substantially Similar" Interpretive Rules also provide for blends of methanol up to 0.3 percent by volume exclusive of other oxygenates, and butanol or alcohols of a higher molecular weight up to 2.75 percent by weight. Individual waivers pertaining to the use of oxygenates in unleaded motor gasoline have been issued by the EPA. They include the following:

- *Fuel Ethanol:* Blends of up to 10 percent by volume anhydrous ethanol (200 proof).
- *Methanol:* Blends of methanol and gasoline-grade tertiary butyl alcohol (GTBA) such that the total oxygen content does not exceed 3.5 percent by weight and the ratio of methanol to GTBA is less than or equal to 1. It is also specified that this blended fuel must meet ASTM volatility specifications. Blends of up to 5.0 percent by volume methanol with a minimum of 2.5 percent by volume cosolvent alcohols having carbon number of 4 or less (i.e., ethanol, propanol, butanol, and/or GTBA). The total oxygen must not exceed 3.7 percent by weight, and the blend must meet ASTM volatility specfications as well as phase separation and alcohol purity specifications.
- *MTBE (Methyl tertiary butyl ether):* Blends up to 15.0 percent by volume MTBE that must meet the ASTM D4814 specifications. Blenders must take precautions that the blends are not used as base gasolines for other oxygenated blends.

**Pentanes Plus:** A mixture of hydrocarbons, mostly pentanes and heavier, extracted from natural gas. Includes isopentane, natural gasoline, and plant condensate.

**Petrochemical Feedstocks:** Chemical feedstocks derived from petroleum principally for the manufacture of chemicals, synthetic rubber, and a variety of plastics. The categories reported are naphthas less than 401° F endpoint and other oils equal to or greater than 401° F endpoint.

**Petroleum:** A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, petroleum products, natural gas plant liquids, and nonhydrocarbon compounds blended into finished petroleum products.

**Petroleum Coke:** A residue that is the final product of the condensation process in cracking. The product is either marketable petroleum coke or catalyst petroleum coke.

**Petroleum Coke, Catalyst:** The carbonaceous residue that is deposited on and deactivates the catalyst used in many catalytic operations (e.g., catalytic cracking). Carbon is deposited on the catalyst, thus deactivating the catalyst. The catalyst is reactivated by burning off the

carbon, which is used as a fuel in the refining process. That carbon or coke is not recoverable in a concentrated form.

**Petroleum Coke, Marketable:** Those grades of coke produced in delayed or fluid cokers that may be recovered as relatively pure carbon. Marketable petroleum coke may be sold as is or further purified by calcining.

**Petroleum Consumption:** The sum of all refined petroleum products supplied. For each refined petroleum product, the amount supplied is calculated by adding production and imports, then subtracting changes in primary stocks (net withdrawals are a plus quantity and net additions are a minus quantity) and exports.

**Petroleum Imports:** Imports of petroleum into the 50 States and the District of Columbia from foreign countries and from Puerto Rico, the Virgin Islands, and other U.S. territories and possessions. Included are imports for the Strategic Petroleum Reserve and withdrawals from bonded warehouses for onshore consumption, offshore bunker use, and military use. Excluded are receipts of foreign petroleum into bonded warehouses and into U.S. territories and U.S. Foreign Trade Zones.

**Petroleum Products:** Products obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

**Petroleum Products Supplied:** See **Petroleum Consumption.**

**Petroleum Stocks, Primary:** For individual products, quantities that are held at refineries, in pipelines, and at bulk terminals that have a capacity of 50,000 barrels or more, or that are in transit thereto. Stocks held by product retailers and resellers, as well as tertiary stocks held at the point of consumption, are excluded. Stocks of individual products held at gas processing plants are excluded from individual product estimates but are included in other oil estimates and total.

**Photovoltaic and Solar Thermal Energy (as used at electric utilities):** Energy radiated by the sun as electromagnetic waves (electromagnetic radiation) that is converted at electric utilities into electricity by means of solar (photovoltaic) cells or concentrating (focusing) collectors.

**Photovoltaic Module:** A group of photovoltaic cells. (Cells are solid-state devices that produce electricity when exposed to sunlight.) The electricity is used primarily in applications requiring remote power, such as radio communication, cathodic protection, and navigational aids.

**Pipeline, Natural Gas:** A continuous pipe conduit, complete with such equipment as valves, compressor stations, communications systems, and meters, for transporting natural gas and/or supplemental gaseous fuels from one point to another, usually from a point in or beyond the producing field or processing plant to another pipeline or to points of utilization. Also refers to a company operating such facilities.

**Pipeline, Petroleum:** Crude oil and product pipelines (including interstate, intrastate, and intracompany pipelines) used to transport crude oil and petroleum products, respectively, within the 50 States and the District of Columbia.

**Plant Condensate:** One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.

**Primary Energy Consumption Expenditures:** Expenditures for energy consumed in each of the four major end-use sectors, excluding energy in the form of electricity, plus expenditures by the electric utilities sector for energy used to generate electricity. There are no fuel-associated expenditures for hydroelectric power, geothermal energy, photovoltaic and solar energy, or wind energy. Also excluded are the quantifiable consumption expenditures that are an integral part of process fuel consumption.

**Process Fuel:** All energy consumed in the acquisition, processing, and transportation of energy. Quantifiable process fuel includes three categories: natural gas lease and plant operations, natural gas pipeline operations, and oil refinery operations.

**Processing Gain:** The amount by which total volume of refinery output is greater than the volume of input for a given period of time. The processing gain arises when crude oil and other hydrocarbons are processed into products that are, on average, less dense than the input.

**Processing Loss:** The amount by which total volume of refinery output is less than input for a given period of time. The processing loss arises when crude oil and other hydrocarbons are processed into products that are, on average, more dense than the input.

**Processing Plant (natural gas):** A surface installation designed to separate and recover natural gas liquids from a stream of produced natural gas through the processes of condensation, absorption, refrigeration, or other methods, and to control the quality of natural gas marketed or returned to oil or gas reservoirs for pressure maintenance, repressuring, or cycling.

**Propane:** A normally gaseous straight-chain hydrocarbon ($C_3H_8$). It is a colorless paraffinic gas that boils at a temperature of -43.67° F. It is extracted from natural gas or refinery gas streams. It includes all products designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

**Propylene:** An olefinic hydrocarbon ($C_3H_6$) recovered from refinery or petrochemical processes.

**Proved Reserves, Crude Oil:** The estimated quantities of all liquids defined as crude oil that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Lease Condensate:** The volumes of lease condensate expected to be recovered in future years in conjunction with the production of proved reserves of natural gas based on the recovery efficiency of lease and/or field separation facilities installed.

**Proved Reserves, Natural Gas:** The estimated quantities of natural gas that analysis of geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

**Proved Reserves, Natural Gas Liquids:** Those volumes of natural gas liquids (including lease condensate) demonstrated with reasonable certainty to be separable in the future from proved natural gas reserves, under existing economic and operating conditions.

**Real Price:** A price that has been adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices, which are expressed in chained dollars in this report, reflect buying power relative to a reference year. See **Chained Dollars.**

**Refiner Acquisition Cost of Crude Oil:** The cost of crude oil to the refiner, including transportation and fees. The composite cost is the weighted average of domestic and imported crude oil costs.

**Refinery Input:** The raw materials and intermediate materials processed at refineries to produce finished petroleum products. They include crude oil, products of natural gas processing plants, unfinished oils, other hydrocarbons and alcohol, motor gasoline and aviation gasoline blending components, and finished petroleum products.

**Refinery Output:** The total amount of petroleum products produced at a refinery. Includes petroleum consumed by the refinery.

**Refinery (petroleum):** An installation that manufactures finished petroleum products from crude oil, unfinished oils, natural gas liquids, other hydrocarbons, and alcohol.

**Renewable Energy:** Energy obtained from sources that are essentially inexhaustible (unlike, for example, the fossil fuels, of which there is a finite supply). Renewable sources of energy include wood, waste, geothermal, wind, photovoltaic, and solar thermal energy.

**Reservoir Repressuring:** The injection of a pressurized fluid (such as air, gas, or water) into oil and gas reservoir formations to effect greater ultimate recovery.

**Residential Building:** A structure used primarily as a dwelling for one or more households.

**Residential Sector:** The residential sector is considered to consist of all private residences, whether occupied or vacant, owned or rented, including single-family homes, multifamily housing units, and mobile homes. Secondary homes, such as summer homes, are also included. Institutional housing, such as school dormitories, hospitals, and military barracks, generally are not included in the residential sector; they are included in the commercial sector. The Standard Industrial Classification (SIC) code used to classify an establishment as residential is 88 (Household).

**Residential Vehicles:** Motorized vehicles used by U.S. households for personal transportation. Excluded are motorcycles, mopeds, large trucks, and buses. Included are automobiles, station wagons, passenger vans, cargo vans, motor homes, pickup trucks, and jeeps or similar vehicles. In order to be included, vehicles must be: (1) owned by members of the household, or (2) company cars not owned by household members but regularly available to household members for their personal use and ordinarily kept at home, or (3) rented or leased for 1 month or more.

**Residual Fuel Oil:** The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are distilled away in refinery operations and that conform to ASTM Specifications D396 and D975. Included are No. 5, a residual fuel oil of medium viscosity; Navy Special, for use in steam-powered vessels in government service and in shore power plants; and No. 6, which includes Bunker C fuel oil and is used for commercial and industrial heating, electricity generation, and to power ships. Imports of residual fuel oil include imported crude oil burned as fuel.

**Road Oil:** Any heavy petroleum oil, including residual asphaltic oil, used as a dust palliative and surface treatment on roads and highways. It is generally produced in six grades, from 0, the most liquid, to 5, the most viscous.

**Rotary Rig:** A machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

**Royalty Interest:** An interest in a mineral property provided through a royalty contract.

**Rural Area:** A place that had a population of less than 2,500 as of the 1980 U.S. Census.

**Short Ton (coal):** A unit of weight equal to 2,000 pounds.

**SIC:** See **Standard Industrial Classification.**

**Small Power Producer:** Under the Public Utility Regulatory Policies Act, a small power production facility (small power producer) generates electricity by using waste or renewable energy (biomass, conventional hydroelectric, wind, solar, and geothermal) as a primary energy source. Fossil fuels can be used, but renewable resources must provide at least 75 percent of the total energy input. See **Nonutility Power Producer.**

**Solar Collector:** Equipment that actively concentrates thermal energy from the sun. The energy is usually used for space heating, for water heating, or for heating swimming pools. Either air or liquid is the working fluid.

**Solar Energy:** The radiant energy of the sun that can be converted into other forms of energy, such as heat or electricity.

**Solar Thermal Collector:** A device designed to receive solar radiation and convert it into thermal energy. Normally, a solar thermal collector includes a frame, glazing, and an absorber, together with appropriate insulation. The heat collected by the solar thermal collector may be used immediately or stored for later use.

**Solar Thermal Collector, High-Temperature:** A collector that generally operates at temperatures above 180° F.

**Solar Thermal Collector, Low-Temperature:** A collector that generally operates at temperatures below 110° F. Typically, it has no glazing or insulation and is made of plastic or rubber, although some are made of metal.

**Solar Thermal Collector, Medium-Temperature:** A collector that generally operates at temperatures of 140° to 180° F but can also operate at temperatures as low as 110° F. Typically, it has one or two glazings, a metal frame, a metal absorption panel with integral flow channels or attached tubing (liquid collector) or with integral ducting (air collector) and insulation on the sides and back of the panel.

**Solar Thermal Collector, Special:** An evacuated tube collector or a concentrating (focusing) collector. Special collectors operate in the temperature range from just above ambient temperature (low concentration for pool heating) to several hundred degrees Fahrenheit (high concentration for air conditioning and specialized industrial processes).

**Space Heating:** The use of mechanical equipment (including wood stoves and active solar heating devices) to heat all, or part, of a building to at least 50° F.

**Special Naphthas:** All finished products within the naphtha boiling range that are used as paint thinners, cleaners, or solvents. Those products are refined to a specified flash point. Special naphthas include all commercial hexane and cleaning solvents conforming to ASTM Specifications D1836 and D484, respectively. Naphthas to be blended or marketed as motor gasoline or aviation gasoline, or that are to be used as petrochemical and synthetic natural gas (SNG) feedstocks, are excluded.

**Spot Market Price:** A transaction price concluded "on the spot," that is, on a one-time, prompt basis; usually the transaction involves only one specific quantity of product. This contrasts with a term contract sale price, which obligates the seller to deliver a product at an agreed frequency and price over an extended period.

**Standard Industrial Classification (SIC):** A set of codes developed by the Office of Management and Budget which categorizes industries according to groups with similar economic activities.

**Startup Test Phase of Nuclear Power Plant:** A nuclear power plant that has been licensed by the Nuclear Regulatory Commission to operate but is still in the initial testing phase, during which the production of electricity may not be continuous. In general, when the electric utility is satisfied with the plant's performance, it formally accepts the plant from the manufacturer and places it in commercial operation status. A request is then submitted to the appropriate utility rate commission to include the power plant in the rate base calculation.

**Steam-Electric Power Plant:** A plant in which the prime mover is a steam turbine. The steam used to drive the turbine is produced in a boiler where fossil fuels are burned.

**Still Gas (refinery gas):** Any form or mixture of gas produced in refineries by distillation, cracking, reforming, and other processes. The principal constituents are methane, ethane, ethylene, normal butane, butylene, propane, and propylene. It is used primarily as refinery fuel and petrochemical feedstock.

**Strategic Petroleum Reserve (SPR):** Petroleum stocks maintained by the Federal Government for use during periods of major supply interruption.

**Stripper Well (natural gas):** A well that produces 60 thousand cubic feet per day or less of gas-well gas, for a period of 3 consecutive months while producing at its maximum rate flow. In determining abandonments, a stripper well is one that produced less than 22.5 million cubic feet in its last 12 months of production.

**Stripper Well Property (petroleum):** A property whose average daily production of crude oil per well (excluding condensate recovered in nonassociated natural gas production) did not exceed an average of 10 barrels per day during any preceding consecutive 12-month period beginning after December 31, 1972.

**Subbituminous Coal:** A dull, black coal of rank intermediate between lignite and bituminous coal. It conforms to ASTM Specification D388-84 for subbituminous coal. In this report, subbituminous coal is included in bituminous coal.

**Supplemental Gaseous Fuels:** Any gaseous substance that, introduced into or commingled with natural gas, increases the volume available for disposition. Such substances include, but are not limited to, propane-air, refinery gas, coke oven gas, still gas, manufactured gas, biomass gas, or air or inert gases added for Btu stabilization.

# Glossary

**Synthetic Natural Gas (SNG):** A manufactured product chemically similar in most respects to natural gas, resulting from the conversion or reforming of petroleum hydrocarbons. It may easily be substituted for, or interchanged with, pipeline quality natural gas. Also referred to as substitute natural gas.

**Transportation Sector:** The transportation sector consists of private and public vehicles that move people and commodities. Included are automobiles, trucks, buses, motorcycles, railroads, and railways (including streetcars), aircraft, ships, barges, and natural gas pipelines. The SIC codes used to classify establishments as belonging to the transportation sector are 40 through 49.

**Unaccounted-for Crude Oil:** Represents the arithmetic difference between the calculated supply and the calculated disposition of crude oil. The calculated supply is the sum of crude oil production and imports, less changes in crude oil stocks. The calculated disposition of crude oil is the sum of crude oil input to refineries, crude oil exports, crude oil burned as fuel, and crude oil losses.

**Unaccounted-for Natural Gas:** Quantities lost, the net result of flow data metered at varying temperature and pressure conditions and converted to a standard temperature and pressure base; metering inaccuracies; differences between the billing cycle and calendar period timeframes; the effect of variations in company accounting and billing practices; and imbalances from the merger of data reporting systems which vary in scope, format, definitions, and type of respondents.

**Underground Storage:** The storage of natural gas in underground reservoirs at locations other than those from which it was produced.

**Undiscovered Recoverable Reserves (crude oil and natural gas):** Those economic resources of crude oil and natural gas, yet undiscovered, that are estimated to exist in favorable geologic settings.

**Unfinished Oils:** All oils requiring further refinery processing, except those requiring only mechanical blending. Includes naphthas and lighter oils, kerosene and light gas oils, heavy gas oils, and residuum.

**Unfractionated Streams:** Mixtures of unsegregated natural gas liquid components, excluding those in plant condensate. This product is extracted from natural gas.

**United States:** Unless otherwise noted, United States in this publication means the 50 States and the District of Columbia. U.S. exports include shipments to U.S. territories, and imports include receipts from U.S. territories.

**Uranium:** A heavy, naturally radioactive, metallic element (atomic number 92). Its two principally occurring isotopes are uranium-235 and uranium-238. Uranium-235 is indispensable to the nuclear industry, because it is the only isotope existing in nature to any appreciable extent that is fissionable by thermal neutrons. Uranium-238 is also important, because it absorbs neutrons to produce a radioactive isotope that subsequently decays to plutonium-239, an isotope that also is fissionable by thermal neutrons.

**Uranium Ore:** Rock containing uranium mineralization (typically 1 to 4 pounds of $U_3O_8$ per ton or 0.05 percent to 0.2 percent $U_3O_8$) that can be mined economically.

**Uranium Oxide:** Uranium concentrate or yellowcake.

**Uranium Resources:** Uranium resource estimates are divided into three separate categories reflecting different levels of confidence in the quantities estimated: reasonable assured resources, estimated additional resources, and speculative resources. Reasonably assured resources refers to uranium in known mineral deposits of such size, grade, and configuration that it could be recovered within the given cost ranges with currently proven mining and processing technology. Estimated additional resources refers to uranium in addition to reasonably assured resources that is expected, mostly on the basis of direct geological evidence, to occur in extensions of well-explored deposits and in deposits in which geological continuity has been well established, as well as in deposits believed to exist in well-defined geologic trends or areas of mineralization with known deposits. Deposits in this category can be discovered and delineated and the uranium subsequently recovered, all within the given cost range. Speculative resources refers to uranium in

addition to estimated additional resources that are thought to exist, mostly on the basis of indirect evidence and geological extrapolations.

**Urban Area:** A place that had a population of 2,500 or more as of the 1970 U.S. Census.

**U.S.S.R.:** The Union of Soviet Socialist Republics consisted of 15 constituent republics: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. As a political entity, the U.S.S.R. ceased to exist as of December 31, 1991.

**Vented Natural Gas:** Gas released into the air on the base site or at processing plants.

**Vessel:** Tankers used to transport crude oil and petroleum products. Vessel categories are as follows: Ultra Large Crude Carrier (ULCC), Very Large Crude Carrier (VLCC), Other Tanker, and Specialty Ships (LPG/LNG).

**Waxes:** Solid or semisolid materials derived from petroleum distillates or residues. Waxes are light-colored, more or less translucent crystalline masses, slightly greasy to the touch, consisting of a mixture of solid hydrocarbons in which the paraffin series predominates. Included are all marketable waxes, whether crude scale or fully refined. Waxes are used primarily as industrial coating for surface protection.

**Well:** A hole drilled in the Earth for the purpose of finding or producing crude oil or natural gas; or providing services related to the production of crude oil or natural gas. Wells are classified as oil wells, gas wells, dry holes, stratigraphic test wells, or service wells. The latter two types of wells are counted for Federal Reporting System data reporting. Oil wells, gas wells, and dry holes are classified as exploratory wells or development wells. Exploratory wells are subclassified as new-pool wildcats, deeper-pool tests, shallow-pool tests, and outpost (extension) tests. Well classifications reflect the status of wells after drilling has been completed.

**Wellhead Price:** The value of crude oil or natural gas at the mouth of the well.

**Well Servicing Unit:** Truck-mounted equipment generally used for downhole services after a well is drilled. Services include well completions and recompletions, maintenance, repairs, workovers, and well plugging and abandonments. Jobs range from minor operations, such as pulling the rods and rod pumps out of an oil well, to major workovers, such as milling out and repairing collapsed casing. Well depth and characteristics determine the type of equipment used.

**Wind Energy (as used at electric utilities):** The kinetic energy of wind converted at electric utilities into mechanical energy by wind turbines (i.e., blades rotating from a hub) that drive generators to produce electricity for distribution.

**Wood and Waste (as used at electric utilities):** Wood energy, garbage, bagasse, sewerage gas, and other industrial, agricultural, and urban refuse used to generate electricity for distribution.

**Wood Energy:** Wood and wood products used as fuel, including round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, pulp waste, and spent pulping liquor.

**Working Gas:** The gas in a reservoir that is in addition to the base (cushion) gas. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any given season.

**Working Interest:** An interest in a mineral property that entitles the owner to explore, develop, and operate a property. The working interest owner bears the costs of exploration, development, and operation of the property and, in return, is entitled to a share of the mineral production from the property or to a share of the proceeds.

**Yellowcake:** A uranium oxide concentrate that results from milling (concentrated) uranium ore. It is the final precipitate formed in the milling process. $U_3O_8$, a common form of triuranium oxide, is the powder obtained by evaporating an ammonia solution of the oxide. Yellowcake typically contains 80 percent to 90 percent $U_3O_8$.

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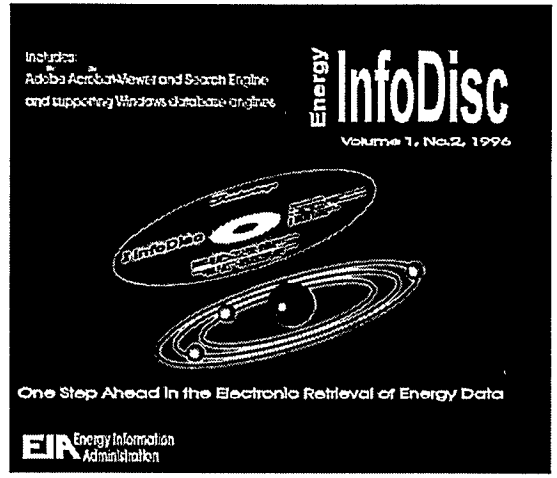


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