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The Energy Information Administration
is pleased to announce the

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Symposium on Short-Term Energy Forecasting

November 21, 1991
Crystal Gateway Marriott
Arlington, VA

The focus of the symposium is to provide an opportunity for users of the *Short-Term Energy Outlook* and EIA staff members to discuss forecasting methodology as well as alternative insights into ongoing energy market developments and emerging issues having an impact on short-term energy analysis. Guest speakers from government and industry will discuss their forecasting methods and compare their results with the projections presented in the fourth quarter *Short-Term Energy Outlook*. It is anticipated that input from outside experts will enhance the understanding and ability of EIA staff to provide short-term energy analysis and forecasts.

Main discussion sessions include: *Winter 1991-1992: Forecasting the Heating Oil Market*
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Concurrent panel discussions : *Forecasting Petroleum Prices*
Forecasting Natural Gas Prices
Short-Term Energy Model Development

Registration for the Symposium on Short-Term Energy Forecasting is on a first-come, first-served basis. No fee is required. A detailed agenda will be mailed to subscribers of the *Short-Term Energy Outlook* in early September. For further information, call Evelyn Amerchih, 202/586-8760.

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Preface

The Energy Information Administration (EIA) presents future cases of quarterly short-term energy supply, demand, and prices for publication in February, May, August, and November in the *Short-Term Energy Outlook (Outlook)*. An annual supplement analyzes the performance of previous forecasts, compares recent cases with those of other forecasting services, and discusses current topics related to the short-term energy markets. (See *Short-Term Energy Outlook: Annual Supplement*, DOE/EIA-0202.) The principal users of the *Outlook* are managers and energy analysts in private industry and government.

The forecast period for this issue of the *Outlook* extends from the third quarter of 1991 through the fourth quarter of 1992. Some data for the second quarter of 1991 are preliminary EIA estimates (for example, some petroleum estimates are based on statistics from the *Weekly Petroleum Status Report*) or are derived from internal model simulations using the latest exogenous information available (for example, some electricity demand estimates are based on recent weather data).

The cases are produced using the Short-Term Integrated Forecasting System (STIFS). The STIFS model is driven principally by the following sets of assumptions or inputs: estimates of key macroeconomic variables, world oil price assumptions, and assumptions about the severity of weather. Macroeconomic estimates are produced by DRI/McGraw-Hill, but are adjusted by EIA to reflect EIA assumptions about the world price of crude oil, energy product prices, and other assumptions which may affect the macroeconomic outlook. (The EIA model is available on computer tape from the National Technical Information Service.)

The cases and historical data are based on EIA data published in the *Monthly Energy Review*, *Petroleum Supply Monthly*, and other EIA publications. Minor discrepancies between the data in those publications and the historical data in this *Outlook* are due to independent rounding. All percentage changes are calculated from the values in the tables rather than from any rounded numbers cited in the text.

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Highlights

Gradual Improvement in the Economy Expected

In the underlying economic forecast, only gradual growth in the economy is expected through 1992 for several reasons. First, housing sales and residential construction, sectors that usually grow quickly after recessions, still suffer from overcapacity. Second, consumption is not likely to rebound as fast because debt levels remain high. Third, fiscal policy is not likely to provide further stimulus since both the Federal and State governments are under pressure to cut spending. Finally, recent losses and increased capital requirements in the financial sector will slow the expansion of credit over the next several quarters.

U.S. Petroleum Demand to Pick Up by 1992

The combination of economic recession, milder-than-normal weather, and some efficiency gains is expected to depress U.S. petroleum demand in 1991. By 1992, however, an assumed return to normal weather and progress toward economic recovery are expected to induce an increase of 1.6 to 2.8 percent in petroleum consumption, depending on the oil price path.

U.S. Petroleum Output Looks Strong Now, but Decline Resumes in 1992

This year is expected to provide a brief respite from the annual decline in U.S. crude oil production that has occurred since 1985, with the 1991 level expected to remain about even with the 1990 output of 7.4 million barrels per day. Next year, production is expected to resume declining to between 6.9 and 7.3 million barrels per day depending on the level of world oil prices and other factors.

Natural Gas Demand Sluggish in 1991, but Improves in 1992

Total natural gas demand in 1991 is expected to be about even with the 1990 total, mainly because of the recession, but also because industrial gas use rose sharply during the Persian Gulf crisis with its attendant oil price spike. Industrial sector use during the first quarter of 1991 was at especially high levels due to favorable supply conditions. By 1992, all major sectors are expected to show growth. Natural gas prices are expected to remain low compared to historical levels as gas availability remains high relative to current demand.

Electricity Demand Growth Expected this Year, Despite Economic Recession

Electricity sales are expected to increase slightly in 1991, despite the economic recession. Total sales are expected to rise by 1.5 percent in 1991, even though gross national product is expected to decline slightly. Continued growth in the residential sector should offset a decline expected for industrial sales in 1991. By next year, an improved economic climate should boost demand in all sectors and result in total growth of 3.6 percent in the mid-price case.

Coal Production Retreats from Record Levels

U.S. coal production is expected to retreat to just over 1 billion tons in 1991, following a year in which domestic output surged by nearly 5 percent, or 48 million tons. Coal stocks, which were generally reduced between 1987 and 1989, were replenished in 1990 and are currently at quite adequate levels, particularly with weak demand this year. A recovery in coal consumption is expected to lead to increases in coal output that would yield a 1992 total close to the 1990 record of 1.029 billion short tons.

Note: The data referenced may be found in Table 1 or in the tables located in the back of this report.

Table 1. U. S. Energy Supply and Demand Summary

	Price Range ^a	Year				Annual Percentage Change		
		1989	1990	1991	1992	1989-1990	1990-1991	1991-1992
Real Gross National Product								
(billion 1982 dollars)	Mid	4120	4157	<i>4154</i>	<i>4264</i>	0.9	<i>-0.1</i>	<i>2.6</i>
Imported Crude Oil Price								
(nominal dollars per barrel)	Low			<i>17.29</i>	<i>16.00</i>		<i>-20.6</i>	<i>-7.5</i>
	Mid	18.09	21.78	<i>19.12</i>	<i>20.25</i>	20.4	<i>-12.2</i>	<i>5.9</i>
	High			<i>20.39</i>	<i>22.25</i>		<i>-6.4</i>	<i>9.1</i>
Petroleum Supply								
Crude Oil Production ^b (million barrels per day)	Low			<i>7.29</i>	<i>6.87</i>		<i>-1.0</i>	<i>-5.8</i>
	Mid	7.61	7.36	<i>7.37</i>	<i>7.09</i>	-3.3	<i>0.1</i>	<i>-3.8</i>
	High			<i>7.44</i>	<i>7.27</i>		<i>1.1</i>	<i>-2.3</i>
Net Petroleum Imports, Including SPR (million barrels per day)	Low			<i>6.78</i>	<i>7.67</i>		<i>-5.3</i>	<i>13.1</i>
	Mid	7.20	7.16	<i>6.64</i>	<i>7.28</i>	-0.6	<i>-7.3</i>	<i>9.6</i>
	High			<i>6.52</i>	<i>6.97</i>		<i>-8.9</i>	<i>6.9</i>
Energy Demand								
Total Petroleum Product Supplied (million barrels per day)	Low			<i>16.63</i>	<i>17.09</i>		<i>-2.1</i>	<i>2.8</i>
	Mid	17.33	16.99	<i>16.58</i>	<i>16.92</i>	-2.0	<i>-2.4</i>	<i>2.1</i>
	High			<i>16.54</i>	<i>16.80</i>		<i>-2.6</i>	<i>1.6</i>
Natural Gas Consumption (trillion cubic feet)	Low			<i>18.58</i>	<i>18.89</i>		<i>-1.2</i>	<i>1.7</i>
	Mid	18.80	18.80	<i>18.78</i>	<i>19.36</i>	0.0	<i>-0.1</i>	<i>3.1</i>
	High			<i>18.89</i>	<i>19.61</i>		<i>0.5</i>	<i>3.8</i>
Coal Consumption (million short tons)	Mid	891	895	<i>897</i>	<i>928</i>	0.4	<i>0.2</i>	<i>3.5</i>
Electricity Sales ^c (billion kilowatthours)	Mid	2647	2705	<i>2746</i>	<i>2845</i>	2.2	<i>1.5</i>	<i>3.6</i>
Gross Energy Consumption ^d (quadrillion Btu)	Mid	81.3	81.6	<i>81.2</i>	<i>83.5</i>	0.4	<i>-0.5</i>	<i>2.8</i>
Thousand Btu/1982 Dollar of GNP	Mid	19.73	19.63	<i>19.54</i>	<i>19.58</i>	-0.5	<i>-0.5</i>	<i>0.2</i>

^a"Price Range" refers to the imported refiners' acquisition cost of crude oil assumed for the scenario depicted. In all cases for this table, the mid-case macroeconomic outlook is assumed, and weather is assumed to be normal.

^bIncludes lease condensate.

^cTotal annual electricity sales for historical periods are derived from the sum of monthly sales figures based on submissions by electric utilities of Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions." These historical values differ from annual sales totals based on Form EIA-861, reported in several EIA publications, but match alternate annual totals reported in EIA's *Electric Power Monthly*, DOE/EIA-0226.

^dThe conversion from physical units to Btu is calculated using a subset of *Monthly Energy Review* (MER) conversion factors. Consequently, the historical data may not precisely match that published in the MER.

SPR: Strategic Petroleum Reserve

Notes: Minor discrepancies with other published EIA historical data are due to independent rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case; D070191BSB20:01 and S071991BSB17:12 for the low oil price case; and D070191BGB18:14 and S071991BGB17:21 for the high oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); *Petroleum Supply Monthly*, DOE/EIA-0190(91/07); *Petroleum Supply Annual 1989*, DOE/EIA-0340(89/1); *Natural Gas Monthly*, DOE/EIA-0130(91/07); *Electric Power Monthly*, DOE/EIA-0226(91/07); and *Quarterly Coal Report*, DOE/EIA-0121(91/1Q). Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0691.

Assumptions

World Oil Prices

Although there are many factors that affect the world oil price, at least three are subject to substantial uncertainty. These three factors are the amount of excess OPEC oil production capacity, the amount of excess petroleum stocks relative to petroleum demand (as measured in days of forward consumption), and the level of oil exports from the Union of Soviet Socialist Republics (U.S.S.R.). The amount of excess OPEC oil production capacity will be affected by the speed with which Iraq and Kuwait are able to restore their oil production and exports. In general, a lower level of excess OPEC oil production capacity will place more upward pressure on prices, but this pressure may be offset, at least partially, by an abnormally high level of petroleum stocks. Oil exports from the U.S.S.R. will be determined by the relative decline rates of both Soviet oil production and consumption, both of which are highly uncertain at this time. In addition to these three factors, another uncertain factor that will strongly affect the world oil price is world economic growth, through its effect on petroleum demand.

Because of this uncertainty, three different world oil price cases are employed (Figure 1 and Table 4). These cases are used to develop a mid-price case projection and alternative projections for domestic petroleum supply and demand.

In the mid-price case, the world oil price increases from an estimated \$18.13 per barrel in the second quarter of 1991 to \$19 in the third quarter and then increases to \$20 in the fourth quarter of 1991, and to \$21 in the fourth quarter of 1992. This case is based on the assumptions that excess OPEC production capacity will remain limited and that OPEC member nations will exert enough production restraint throughout the forecast period to bring petroleum stocks back down into a normal relationship with petroleum demand (as measured by days of forward consumption) by the end of 1992. It also assumes that the United Nations' embargo on Iraqi oil exports will remain in force or that lower production by other OPEC countries will offset any increase in Iraqi oil exports. It is also assumed that there will be a gradual restoration of Kuwaiti crude oil exports beginning in the third quarter of 1991 and that the rate of decline in oil exports from the U.S.S.R. will

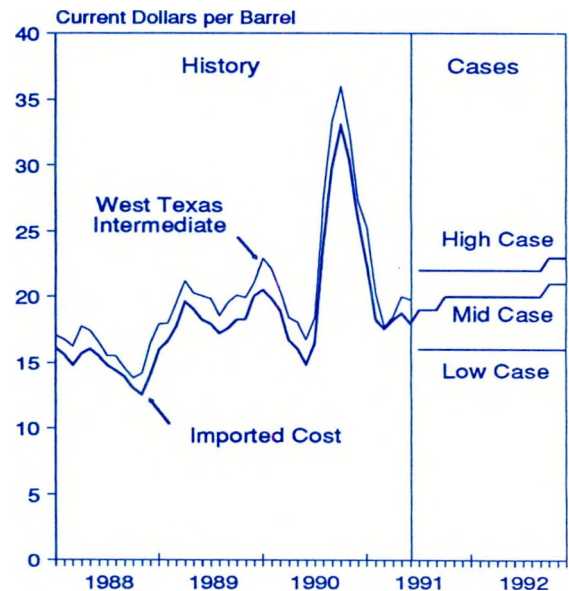


Figure 1. Crude Oil Prices

Note: Imported prices are defined as the cost of imported crude oil to U.S. refiners.

Sources: **History:** Energy Information Administration, *Monthly Energy Review* (July 1991); and *Oil and Gas Journal* Energy Database. **Cases:** Table 4.

not accelerate. (The international petroleum forecast for the mid-price case is discussed in detail on page 4.)

In the low oil price case, the world oil price decreases to \$16 per barrel in the third quarter of 1991 and remains at this level throughout the forecast period. In this case, it is assumed that production restraint by OPEC member countries is weak and is only sufficient to prevent a complete price collapse. Also, it is assumed that the embargo on Iraqi oil exports is removed and that production declines by other OPEC member countries do not fully offset restored exports from Iraq and Kuwait.

In the high oil price case, the world oil price increases to \$22 per barrel in the third quarter of 1991 and then increases to \$23 in the fourth quarter of 1992. In this case, it is assumed that OPEC production behavior will be at least as restrictive as in the mid-price case. At the same time, other factors are assumed to contribute to

greater upward pressure on the world oil price. These could include larger declines in oil exports from the U.S.S.R. or stronger economic and oil demand growth by the Organization for Economic Cooperation and Development (OECD) countries than assumed in the mid-price case.

Macroeconomic Activity

The energy demand forecasts in this *Outlook* are influenced by the assumption that economic recovery began in the second quarter of 1991.¹ This situation is similar to the one presented in the last *Outlook*, although the rate of recovery is now slower (Table 2). The emphasis here is on a mid-economic scenario, although high and low growth paths are considered in deriving reasonable sensitivity ranges for petroleum demand (Tables 2 and 8). Additionally, the projected recovery is expected to be modest when compared to historical experience. In the post World War II period, the average growth rate in real gross national product (GNP) during the first year of recovery was approximately 6.0 percent. Growth in 1992 is forecasted at 2.6 percent, less than half the first-year average for the six recoveries in the postwar period.²

The economy is not expected to recover very rapidly for several reasons. First, housing sales and residential construction, sectors that usually grow quickly after recessions, still suffer from overcapacity. Second, consumption is not likely to rebound as fast because debt levels remain high. Third, fiscal policy is not likely to provide further stimulus since both the Federal and State governments are under pressure to cut spending. Finally, recent losses and increased capital requirements in the financial sector will slow the expansion of credit over the next several quarters.

Average annual growth in real GNP is expected to be -0.1 percent between 1990 and 1991, despite positive quarter-to-quarter growth starting in the second quarter of this year (Figure 2). The annualized rate of growth, quarter-to-quarter, in real GNP ranges from 2.8 to 3.0 percent through the rest of 1991 and the early part of 1992. Consumption leads the recovery in the second quarter of 1991, followed by investment which begins to recover in the third quarter because interest rates fall.³ For all of 1991, however, an improved trade situation is the only sizable offset to otherwise weak economic activity (Figure 3). The trade balance is also expected to improve in 1991, primarily due to a decrease in imports rather than an increase in exports.

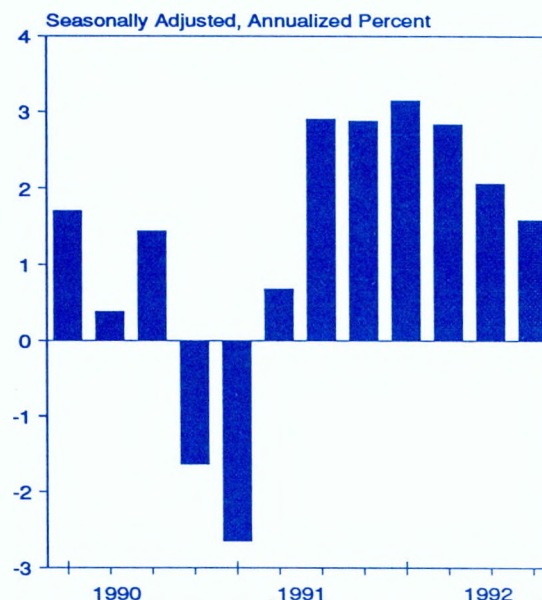


Figure 2. Quarterly Change in Real Gross National Product

Sources: **History:** U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (June 1991). **Projections:** Table 2.

In 1992, projected investment levels off during the latter part of the year and the trade balance deteriorates slightly. The deterioration in the trade balance reflects higher growth in imports relative to exports. Nonetheless, in the mid-economic growth case, increases in exports and investment boost manufacturing production growth to 4.9 percent in 1992, compared with a decline of 2.5 percent in 1991. Real disposable income also increases in 1992 by 1.8 percent after the 1991 decline of 1.0 percent (Table 2). The rate of inflation is favorable in 1992 as well, slowing because of smaller increases in wages.

It should be noted that forecasting macroeconomic growth involves uncertainty about the magnitude of changes in crucial economic variables. The impact of typical changes in the macroeconomic assumptions on the petroleum demand forecast is provided in Table 8.

International Petroleum

The international petroleum forecast uses supply and demand patterns that reflect the mid-price case. This issue of the *Outlook* incorporates a fundamental change

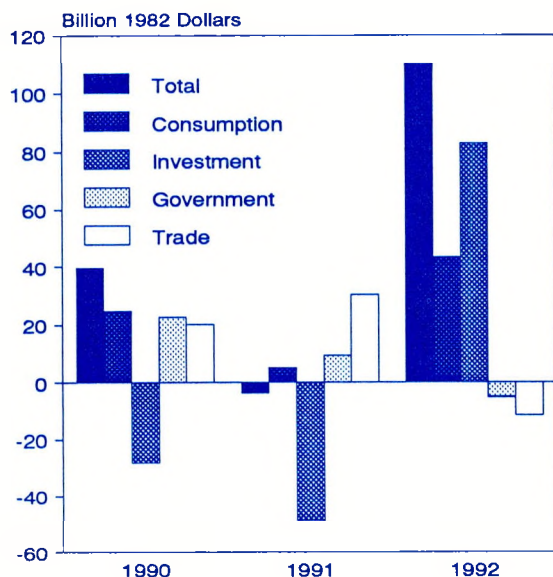


Figure 3. Annual Change in Components of Real Gross National Product

Sources: **History:** U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (June 1991). **Projections:** Table 2.

to the format of the international petroleum balance which is now presented on a truly global basis (Table 3). Demand (previously labelled product supplied) and supply have been expanded to include the former Centrally Planned Economies (CPE) and, at the same time, additional breakdowns of demand and supply have been provided.

Previously, the international petroleum balance presented the supply/demand balance for the Market Economies and included a supply-side element, "Net Centrally Planned Economies Exports." Coverage of demand and supply is now global, with subtotals for the OECD and non-OECD countries. The OECD data have been revised to include East Germany. The non-OECD countries include the other former CPE and the category previously labelled "Other Market Economies." In order to allow for comparisons with other forecasts, "Market Economies Demand" and "Net Exports from Former CPE" have also been provided.

In order to provide a transition to the new global balance, a brief discussion of some of the important aggregates for 1989 and 1990 will precede the discussion of the forecasts for 1991 and 1992.⁴ In 1990,

world oil demand averaged about 66.1 million barrels per day, up 330,000 barrels per day from the 1989 rate. OECD demand increased by 60,000 barrels per day to about 38.0 million barrels per day, while non-OECD demand increased by 270,000 barrels per day to 28.1 million barrels per day. Declines in demand from the U.S.S.R. and non-OECD Europe were offset by increases in other non-OECD countries, especially in Asia.

In 1990, world oil production averaged almost 66.5 million barrels per day, up 650,000 barrels per day from the 1989 rate. Supply from the OECD countries decreased by a marginal 50,000 barrels per day to about 16.9 million barrels per day, as declines in production from the United States and Canada offset increases from other OECD regions. Non-OECD supply increased by 700,000 barrels per day to about 49.5 million barrels per day. Production from the U.S.S.R. decreased by more than 700,000 barrels per day, but this was more than offset by an increase in OPEC production of almost 1.1 million barrels per day, along with smaller increases from other non-OECD regions.

The demand for petroleum products by the world is expected to decrease to an average of 65.9 million barrels per day in 1991, down 150,000 barrels per day, or 0.2 percent, from the 1990 rate (Table 3). In 1992, demand is expected to increase by more than 1.0 million barrels per day, or 1.6 percent.

Petroleum demand by the OECD countries is expected to average 37.8 million barrels per day in 1991, down 140,000 barrels per day, or 0.4 percent from the 1990 rate. This level of demand is based on the assumption that the OECD economies will grow at a rate of only 1.1 percent in 1991 (Table 2). The United States is expected to account for most of the decline in petroleum demand in 1991, while significant growth will occur in OECD Europe and Japan. In 1992, a sharp rebound in the economies of all OECD regions, except Japan, is expected to result in OECD economic growth of 2.7 percent. This, in turn, will contribute to an increase in OECD petroleum demand of 760,000 barrels per day, or 2.0 percent. The United States is expected to account for more than two-fifths of this increase, while Japan will account for more than one-fourth.

Petroleum demand in the non-OECD countries is expected to average 28.1 million barrels per day in 1991, unchanged from the 1990 rate. Declines in demand from the U.S.S.R. and non-OECD Europe, will be just offset by increases from China and the other non-OECD countries. In 1992, petroleum demand by the non-OECD countries is expected to increase by 270,000 barrels per day, or 1.0 percent.

In 1991, world oil production is expected to average almost 66.2 million barrels per day, a decrease of 300,000 barrels per day from the 1990 rate. A sharp decline in production from the U.S.S.R. is expected to more than offset modest increases from the OECD countries, Mexico, and other non-OPEC producing countries. In 1992, non-OPEC oil production is expected to decline by 440,000 barrels per day, driven down by a further decrease of 770,000 barrels per day from the U.S.S.R. This decline in non-OPEC production results in the OPEC increasing its aggregate production by 500,000 barrels per day, even while petroleum stocks are being drawn down by the end of 1992 to a normal relationship with oil demand in terms of days of forward consumption.

Energy Product Prices

Current Situation

World crude oil prices remained in the range of \$17.60 to \$18.75 per barrel from mid-February through June of this year (Figure 1). Relatively low U.S. product demand caused by moderate weather and weak economic conditions, as well as high world oil production have kept prices soft. In this report, the term "demand," in the context of petroleum products, refers to product shipments from primary supply sources, and is otherwise referred to as "product supplied." Spot prices for motor gasoline, on the other hand, remained fairly high through May in anticipation of the driving season and in response to unusually low inventories. No shortages appeared, but spot prices for unleaded regular motor gasoline in New York Harbor reached \$33.10 per barrel in March, then fell, reaching \$25.97 per barrel by the middle of June.⁵ Subsequent stock buildup and continued low demand caused these prices to fall. Spot prices for both distillate and residual fuel oil have been on a downward path since the beginning of the year as the heating season turned out to be very mild, resulting in low demand and adequate or excess stocks. Weakness in the fuel oil markets has been exacerbated by a glut of natural gas which has pushed gas prices to historic lows.⁶

Average U.S. retail motor gasoline prices reached \$1.21 per gallon in May, increasing by 5 cents in one month, in response to low inventories⁷. In March and April 1991, these primary inventories were at their lowest levels in many years, close to the minimum operating inventory of 205 million barrels.⁸ Prices fell in the last week of June as crude oil prices dropped and as stock

levels increased from below average to within the "average range." Gasoline demand through the first half of the year was 2 percent lower than in the previous year, partially offsetting the price effects of low stock levels.⁹

Retail margins (the pump price minus the refiner price) have increased by about 8 to 9 cents per gallon in the first half of the year compared with the same period last year. Most of the increase was due to higher Federal, State, and local taxes. It also appears that retailers have recouped at least some of the increased costs that they were forced to absorb following the rapid wholesale price increase related to the conflict in the Persian Gulf as well as the Federal tax increase of 5 cents per gallon of December 1990.

Refiner margins (the difference between the refiner gasoline price and the refiner acquisition cost for crude oil) have dropped from record high levels of 1 year ago. These high margins were the result of very high refinery utilization rates, high demand and rapidly falling crude oil prices. With stable crude oil prices, lower demand, and slightly lower refinery utilization rates, refiner margins are down a few cents per gallon. Refiner margins for the period April through July averaged 17 cents per gallon in 1987, 23 cents in 1988, 29 cents in 1989, and a record 33 cents in 1990. Margins are expected to average 28 cents per gallon in 1991.¹⁰

Unlike motor gasoline prices, residual fuel oil prices have been falling steadily since the beginning of the year, including the period of uncertainty during the war in the Persian Gulf.¹¹ High inventories worldwide, as well as falling crude oil prices, weak domestic natural gas prices, and a sluggish economy, have contributed to the low prices. From March through June of this year, retail residual fuel oil prices have averaged about \$5.00 per barrel less than the refiner acquisition cost for crude oil. This sustained and large price difference parallels the situation that occurred from August through December 1990 when high stock levels kept residual fuel prices depressed.¹²

Spot prices for wellhead natural gas since February 1991 have been the lowest since the establishment of the gas spot market, reaching \$1.04 per million Btu for the first week of July.¹³ This appears to be a continuation of a downward price trend that began in March 1990, and is largely due to very mild winter temperatures since January 1990. The warm temperatures dampened residential and commercial heating demand and swelled storage levels (see Natural Gas section on page 13). To a lesser extent, the weak economy, which lowered industrial demand for electricity and total

fossil fuels, has tended to hold back prices. Second quarter prices of residual fuel oil to electric utilities have fallen to levels close to and, in some regions, below the price of natural gas on a cents-per-Btu basis. These low residual fuel oil prices, because of substitution possibilities in the electric utility and industrial sectors, have put further downward pressure on gas prices. The gas price situation is so depressed that one Southwest utility reports that gas has displaced some coal in its power generating operations.¹⁴

Price Outlook

The following discussion provides projections for energy product prices, given the three assumed crude oil price cases (Table 4). The variation among cases in the petroleum product prices comes essentially from the pass-through of the differences in crude oil prices and, to a lesser extent, from differences in supply and demand conditions for particular products.

Mid-Price Case. Based on crude oil prices of \$19.12 per barrel in 1991 and \$20.25 in 1992, most petroleum product prices would decline in 1991, then rise slightly in 1992. Motor gasoline prices, in contrast to the sharp fluctuations in 1990, are expected to exhibit comparative stability this year, although normal seasonal variation is expected to occur. Annual average pump prices for gasoline should be about even with 1990 levels, with decreases in the relatively high refiner margins of 1990 offsetting increases in retail margins including Federal, State, and local taxes. In 1992, higher crude oil costs and inflation are expected to add an additional 3 cents per gallon to the pump price (Table 4 and Figure 4). Heating oil and diesel fuel prices should follow gasoline prices, with prices increasing moderately in 1992. However, severe winter weather could increase distillate prices by considerably more. Residual fuel oil prices are expected to average about \$3.50 per barrel less than crude oil prices in 1991, as the supply of this fuel is projected to be more than adequate. This price difference is expected to decrease by \$1 to just over \$2.40 per barrel in 1992, as the economy picks up and as supply returns to the normal range.

Natural gas wellhead prices in the mid-price case are expected to dip slightly in 1991, because of favorable supply conditions. Moreover, the economy is expected to remain sluggish until the latter part of 1991, easing upward pressure on prices. In 1992, after years of stagnation and decline, wellhead prices are projected to increase by about 9.5 percent due to a strengthened economy, slightly higher world oil prices, and an assumption of normal weather. However, if the winter

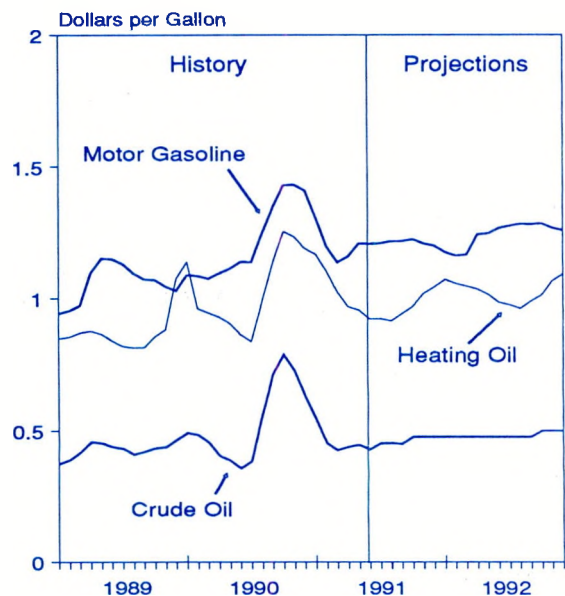


Figure 4. Crude Oil and Product Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review* (July 1991). **Projections:** Table 4.

weather once again is moderate, the expected price rise could be much smaller.

In 1992, higher prices for both crude oil and for natural gas at the wellhead will lead to higher fuel costs to electric utilities for both residual fuel oil and natural gas (Figure 5). On a national average cost-per-Btu basis, it is estimated that the prices paid for these two fuels were nearly equal in the second quarter of 1991, with gas being about 5 percent cheaper than oil. The price difference should begin to widen in the third quarter of 1991, as residual fuel oil prices begin increasing at a faster rate than natural gas wellhead prices. For 1992, natural gas prices should average about 14 percent less than oil on an annual basis.

Coal prices to electric utilities are expected to rise only slightly in 1991 and 1992, assuming continuing high levels of productivity and more than sufficient stock levels. The slight increase in labor and fuel (diesel) costs of mining and transportation add marginally to the average price of coal.

Residential electricity prices are projected to increase at rates below the rate of inflation in 1991 and in 1992. This outlook is based on expectations of relatively low

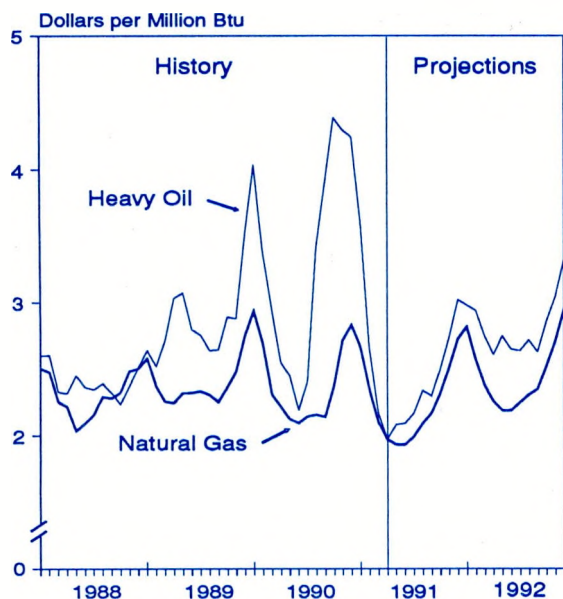


Figure 5. Electric Utility Oil and Natural Gas Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review* (July 1991). **Projections:** Table 4.

fossil fuel prices (mainly coal), small increases in operation and maintenance costs, and low interest rates.

Low Price Case. If crude oil prices were to fall to \$16 per barrel throughout the forecast, most retail petroleum product prices in 1991 would fall by from 4 to 7 cents per gallon from 1990 levels. Although average crude oil prices would be dropping more than \$4 per barrel in 1991 compared to the 1990 average, or nearly 10 cents per gallon, product prices (except residual fuel oil) are not expected to fall by the full 10 cents. Inflation (in labor and non-oil material and operating costs) and increased State taxes should offset some of the tendency toward lower product prices due to the lower crude oil prices. In 1992, crude oil prices drop to about \$1.30 per barrel less than the 1991 average. This would move product prices further downward. Coal prices to electric utilities would be expected to drop slightly through 1992, as the cost of diesel fuel used in the mining and transporting of coal declines.

High Price Case. Crude oil prices for this case average only \$2 per barrel higher than the mid-price case in 1992. Thus, most petroleum product prices would be projected to be higher than the mid-price case by approximately 4 to 6 cents per gallon, depending on the magnitude of any State gasoline tax increases. Natural gas prices at the wellhead and for all sectors would also rise as competitive pressure from oil prices eases. The price of coal to electric utilities, in this scenario, would increase at about the rate of inflation, particularly if there was a prolonged hot summer, and as the prices of oil and gas also rise.

U.S. Petroleum Outlook

Petroleum Demand

Domestic petroleum demand averaged 17.0 million barrels per day in 1990 and is expected to average 16.6 million barrels per day in 1991 in the mid-price case, the lowest annual average level in 5 years. In 1992, however, mid-case petroleum demand is projected to increase to 16.9 million barrels per day (Table 6).

The 1990 average demand of 17.0 million barrels per day represents a 1.9-percent decline from that of the previous year. The slowdown in economic activity, price hikes during the second half of the year resulting from the Persian Gulf crisis, and milder fourth-quarter weather in 1990 accounted for much of that decline. Despite the return of prices to pre-Gulf crisis levels, the decline in petroleum demand in 1991 is expected to be even greater than that of the previous year. Product demand is projected to fall by a further 2.4 percent to 16.6 million barrels per day, assuming that the mid-price case holds. The combination of economic recession and milder-than-normal weather is expected to depress demand. The assumption of normal weather and economic recovery are expected to induce an increase of 2.1 percent in demand in 1992 in the mid-price case.

Changes in economic, oil price, and weather assumptions greatly affect demand projections (Figure 6). The range of expected product supplied associated with the different assumptions for oil prices alone is 90,000 barrels per day in 1991 (between 16.5 and 16.6 million barrels per day) and 290,000 barrels per day in 1992 (between 16.8 and 17.1 million barrels per day) (Tables 5 and 7). In the low price scenario, oil prices average \$17.29 per barrel in 1991 and \$16.00 per barrel in 1992. Corresponding figures for the high price case are \$20.39 and \$22.25.

Incorporating alternative economic and weather assumptions greatly widens the band of possible outcomes. In 1992, the average range of product supplied is 16.4 to 17.6 million barrels per day.¹⁵ The upper demand bound in Figure 6 reflects an assumed combination of lower oil prices, higher economic growth, and more severe weather than those of the base case. In this scenario, real gross national product is expected to increase by 0.7 and 4.1 percent in 1991 and

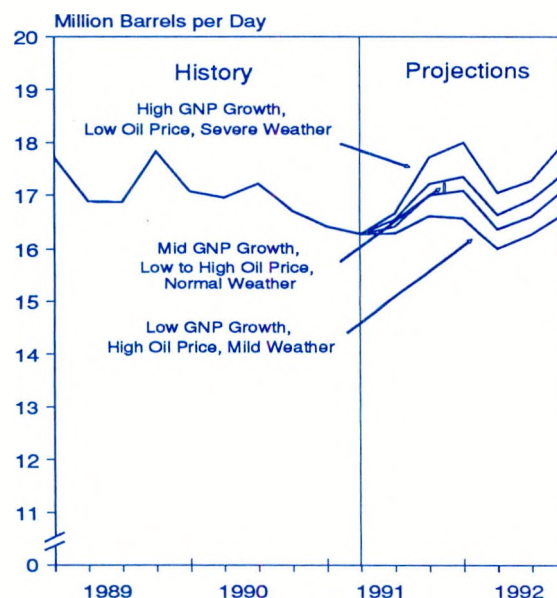


Figure 6. Total Petroleum Demand

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1989*, and *Petroleum Supply Monthly* (July 1991). **Projections:** Tables 5, 6, and 7 and internal model calculations from the Short-Term Integrated Forecasting System.

1992, respectively; weather (in terms of heating degree-days) is assumed to be about 10 percent colder than the base case in 1991 and 1992, respectively. (The 1991 product supplied range includes variations from only the third and fourth quarters.) The lower product supplied bound assumes that real gross national product declines by 0.6 percent in 1991 before recovering by 1.1 percent in 1992, while weather is assumed to be substantially milder than in the base case. A summary of the petroleum product supplied sensitivities discussed here is given below.

Petroleum Product Supplied and Production Sensitivities

The petroleum demand and supply outlook for the mid-price case is based on normal temperatures and a particular set of macroeconomic assumptions. In order

to widen the usefulness of the basic projections provided in the *Outlook*, Table 8 provides a range of possible outcomes and sensitivities when alternative macroeconomic, price, and weather assumptions are used.

The petroleum price sensitivity assumes that non-petroleum prices remain constant. Weather sensitivities are based on assumed deviations from normal temperatures which correspond to one-half the greatest quarterly variances in weather observed during the past 15 years.

Average petroleum sensitivity factors for 1992 for this *Outlook* are summarized below:¹⁶

- A 1-percent increase in real GNP raises petroleum product supplied by about 129,000 barrels per day;
- A \$1 increase in crude oil prices, assuming no price response from non-oil energy sources, reduces product supplied by about 46,000 barrels per day.
- A \$1 increase in crude oil prices, increases domestic oil supply (crude oil and natural gas liquids production) by 33,000 barrels per day;
- A 1-percent increase in cooling degree-days increases product supplied by about 34,000 barrels per day; a 1-percent increase in heating degree-days increases petroleum product supplied by about 12,000 barrels per day.

Petroleum Supply

This year is expected to provide a brief respite from the annual crude oil production decline that the United States has experienced since 1985. The expected level of production for 1991 is 7.37 million barrels per day in the mid-price case, slightly above the 1990 level (Table 6 and Figure 7). The levels of production in both Alaska and the Lower-48 States are expected to remain essentially the same, with a small increase in Alaska more than offsetting an almost imperceptible decline in the Lower-48. The controversial Point Arguello field started production in the second quarter of this year, although it is limited to 20,000 barrels per day. Alaskan production increased in late 1990 and early 1991 due predominantly to installation of expanded gas handling facilities in the Prudhoe Bay field. The strength of Lower-48 production in 1991 is attributed largely to increases in the Federal offshore and horizontal drilling in the Austin Chalk trend of South Texas. In 1992, the overall production decline is expected to resume, with

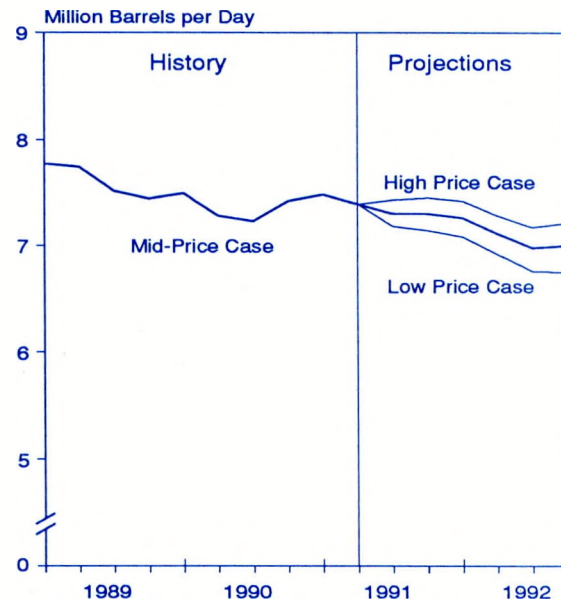


Figure 7. U.S. Crude Oil Production

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1989*, *Petroleum Supply Monthly* (July 1991), and *Weekly Petroleum Status Report* (91-24,25,29). **Projections:** Tables 5, 6, and 7.

total domestic crude oil production expected to fall by 280,000 barrels per day in the mid-price case, with about one-third of that decline attributable to Alaska.

Domestic crude oil production could fall as low as 6.87 million barrels per day in 1992 if the world oil price falls to \$16 per barrel in 1992 (Table 5), or could average 7.27 million barrels per day in 1992 if the world oil price rises to \$22 per barrel in 1992 (Table 7). These estimates contain an uncertainty component as well as a price component. This uncertainty, associated with both the current production level and with the timing of expected events, accounts for approximately 30 percent of the range of production between the low and the high oil price cases. Of the difference between low and high price projections of 460,000 barrels per day for the fourth quarter of 1992, 320,000 barrels per day are attributable to the price impact (Table 9).

For the past 12 months, refineries have been used in a rather unusual seasonal pattern. During the third quarter of 1990, refinery inputs of crude oil exceeded 14 million barrels per day for the first time since the first quarter of 1980. In the fourth quarter of 1990, crude

runs were less than 13 million barrels per day; the quarterly average fell by over 1.3 million barrels per day. After remaining about constant in the first quarter of 1991, refinery runs recovered in the second quarter of 1991, averaging over 13.4 million barrels per day, although the total petroleum product supplied fell off slightly. Throughout this period, product stocks have followed along, increasing when runs were high, decreasing when runs were low. During this period, crude refinery runs have varied more than total product supplied. The forecast calls for a more sedate approach to refining, with production patterns resulting in a more traditional seasonal stock pattern being exhibited for the major products. As a result, the projected level of crude inputs to refineries will decrease in 1991 by approximately 210,000 barrels per day (not quite half the decline in demand), and increase in 1992.

With domestic refining accounting for a greater percentage of domestic petroleum product supply and with requirements for inventory enhancement reduced, net imports of petroleum products are expected to be below historical levels.¹⁷ After averaging only 440,000 barrels per day in the first quarter of 1991, net product imports are expected to rise sufficiently to raise the 1991 average to approximately 1 million barrels per day, or a 28 percent decline from 1990. These net imports are expected to rise to 1.15 million barrels per day in 1992. Total domestic petroleum net import dependence (including crude oil and petroleum products) is expected to drop in 1991 due to level crude oil production coupled with a lower expected demand level. Total net imports should recover in 1992 to a level greater than that reported for 1990 (Figure 8).

Motor Gasoline

Following a 1.3-percent decline in 1990, demand for motor gasoline in the mid-price case is projected to decline by a further 1.0 percent in 1991, and remain flat in 1992 (Table 6). Last year's decline reflects the impacts of both the price hikes brought about by the Persian Gulf conflict and the slowing economy. In 1990, highway travel activity grew by 2.0 percent, less than half of the growth rate in 1989 and the smallest increase since the early 1980's. In addition, fuel efficiency increased by a substantial 3.3 percent, more than offsetting the impact of the moderate increase in highway travel on gasoline demand (Figure 9). Shipments, however, were apparently depressed by a sizable drawdown in secondary stocks. As a result, data on product supplied for 1990 may have

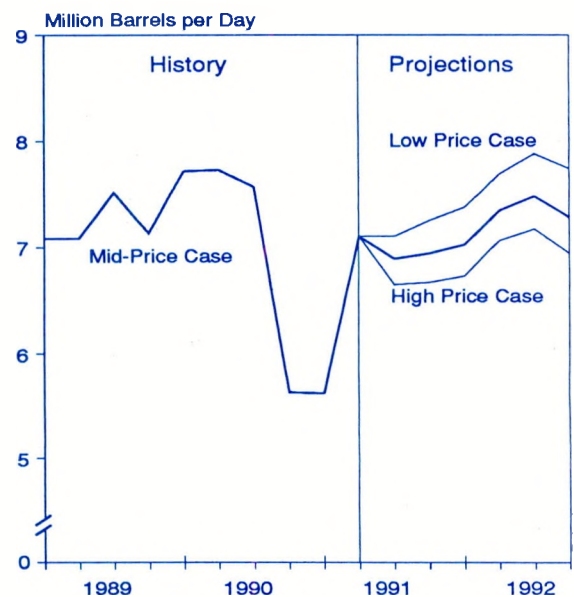


Figure 8. Total Net Petroleum Imports

Note: Crude oil production includes lease condensate.
Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1989*, *Petroleum Supply Monthly* (July 1991), *Weekly Petroleum Status Report* (91-24,25,29). **Projections:** Tables 5, 6, and 7.

understated actual consumption, thereby overstating underlying fuel efficiency gains.

For 1991, the decline in economic activity as well as continued fuel economy gains are expected to bring about a third consecutive annual decline in gasoline demand. For the mid-price case, vehicle-miles traveled, which declined by 0.1 percent for the first 5 months of 1991, are projected to rise by only 0.9 percent for the year as a whole (Figure 9). Fuel efficiency increases are expected to be a more modest 2.0 percent. Secondary stocks, having experienced substantial drawdowns during the previous 2 years, have undergone replenishment during the first 4 months of the year,¹⁸ indicating that the decline in actual consumption may be even greater than that implied by the deliveries data. As a result, the slowing in fuel economy growth may be more moderate than that indicated by primary shipments. In 1992, however, motor gasoline shipments are projected to remain flat. Fuel efficiency is expected to rise by 2.2 percent, more than offsetting the projected 2.2-percent increase in travel (Figure 9).

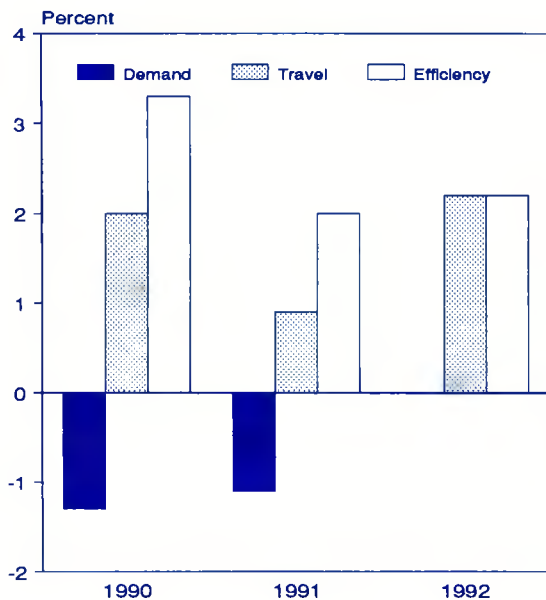


Figure 9. Annual Change in Motor Gasoline Demand Components

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly* (July 1991); and Federal Highway Administration, *Traffic Volume Trends*. **Projections:** Table 6 and internal calculations from the Short-Term Integrated Forecasting System.

Fuel shares by gasoline grade continue to respond sluggishly to the recent declines in prices to pre-Gulf crisis levels (Figure 10). As a result, regular unleaded gasoline's share of the market, which reached a record 71 percent of the market last October, continued to hold a 69-percent share in April, well above the pre-Gulf crisis level of 63 percent. Premium gasoline's market share, which had fallen from 23 percent before the Persian Gulf conflict to 17 percent in January, has recovered slowly to only 18 percent. Mid-grade gasoline's share has continued to remain stable at slightly less than 10 percent of the market. Regular leaded gasoline's share, whose rate of decline has slowed markedly since the beginning of 1990, has fallen to just over 3 percent of the market.

Jet Fuel

In 1990, jet fuel demand rose by 2.0 percent from the previous year. However, the combination of economic recession, cessation of Persian Gulf hostilities, and increasing fuel efficiency is projected to bring about a 4.6-percent decline in consumption in 1991, the first such decline since 1981. The economic recovery is projected to lift demand in 1992 somewhat, but

continued increases in average fuel efficiency and load factor (a measure of aircraft capacity utilization) are expected to constrain demand. The net effect is a limit on growth in jet fuel demand of 2.1 percent next year (Figure 11 and Table 6).

In 1990, non-military growth in jet fuel demand apparently lagged behind that of total demand as a result of both the slowdown in revenue ton-mile growth resulting from the weakening economy and an increase in ticket prices in the wake of additional Persian Gulf-related fuel costs. In fact, total jet fuel consumption for the fourth quarter of 1990 was slightly below that of the previous year despite the Persian Gulf-related fuel demand. In addition, travel posted year-to-year declines for the first quarter of 1991. By spring, the airlines responded by discounting air fares. Lower average ticket prices may offset some of the downward pressure on air travel demand.

The decline in economic activity this year is expected to account for much of the first year-to-year decline in jet fuel demand in almost a decade (Table 6). Revenue ton-miles (a measure of air travel demand, including cargo) and available ton-miles (a measure of airline capacity for passengers and cargo) are projected to decline by 3.7 percent and 4.5 percent, respectively (Figure 11). Moreover, continued increases in efficiency and the absence of a military surge component to jet fuel demand are also expected to contribute to the decline.

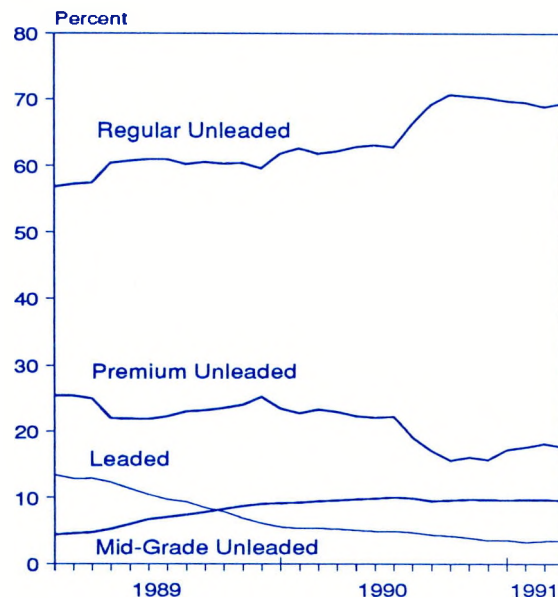


Figure 10. Motor Gasoline Market Shares

Sources: **History:** Energy Information Administration, *Petroleum Marketing Monthly* (July 1991).

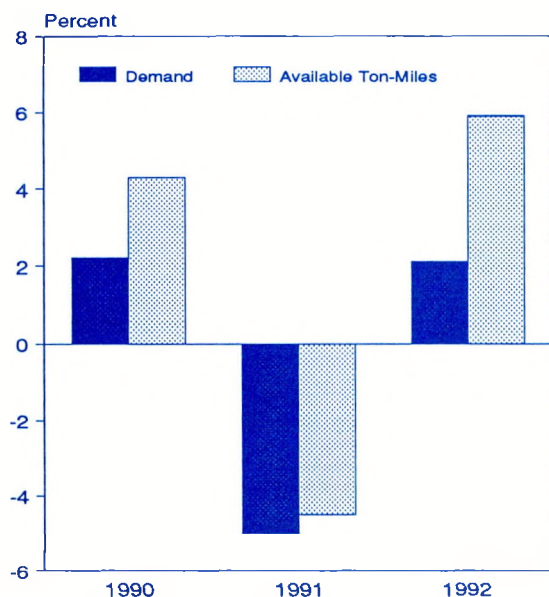


Figure 11. Annual Change In Jet Fuel Demand and Capacity

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly* (July 1991); and Federal Aviation Administration, Form 41. **Projections:** Table 6 and internal calculations from the Short-Term Integrated Forecasting System.

In 1992, the economic recovery is expected to boost airline activity by more than 5 percent, but the increase in jet fuel demand is projected to lag behind the anticipated increases in travel (Figure 11). Increases in load factor and fuel efficiency are projected to absorb much of the impact of robust growth in travel on fuel demand. In addition, the year-to-year increase is smaller because of the temporary boost to jet fuel demand during the first few months of 1991 resulting from the Persian Gulf conflict.

Distillate Fuel Oil

Distillate fuel oil demand has been down sharply so far this year and is expected to average about 2.3 percent below 1990 levels for all of 1991 in the mid-price case (Table 6). Warm winter weather, the effects of the recession, and highly available, low-priced natural gas have all combined to push distillate shipments below last year's levels. A recovery in the economy and a return to normal winter temperatures next year should

result in higher distillate demand in 1992, with an increase of 6.1 percent expected in the mid-price case.

While weather conditions in the early part of 1991 were mild compared to normal, national heating degree-days actually increased in the first quarter, compared to the same period in 1990 (Table 2). This was true even in the heating oil-dependent Northeast, although increases in New England were relatively mild compared to other regions.¹⁹ An increase in heating degree-days would normally lead to year-over-year increases in heating oil demand, but such a development is not apparent from the data. Energy Information Administration data on residential heating oil sales in early 1991 indicate level sales from the first quarter 1990 to the same period this year.²⁰

Several factors may have contributed to this weakness in heating oil demand. In the first place, excess shipments of heating oil probably occurred in early 1990 in response to the frigid conditions of the preceding December. Residential heating oil stock replenishment was probably excessive as the warmest first quarter in many years ensued. The warm weather ending 1990 exacerbated the situation of excess heating oil stocks at residences and may have obviated the necessity for as much in early 1991 purchases as might otherwise have been expected. As far as primary inventories are concerned, at this time distillate stocks are comfortably above the average range.²¹

Beyond the abnormal inventory behavior as an explanation for the current heating oil situation, it is possible that some significant net reductions in heating oil customers due to conversions to natural gas for home heating following the 1989 cold snap have already made themselves felt. If so, the outlook for heating oil (and distillate generally) may not be as strong as is indicated in this *Outlook*.

Even with the possibility of some excess heating oil inventories being generated last year, 1990 was not a good year for distillate sales. Total product supplied slipped 140,000 barrels per day in 1990. This year, shipments are expected to fall an additional 70,000 barrels per day under the mid-price case, mostly because of fuel demand weakness in the industrial and transportation sectors. All nonutility sectors are expected to recover in 1992, as industrial growth resumes and weather returns to normal. In 1992, distillate fuel oil demand should recover by about 180,000 barrels per day to near the 1989 level of demand.

Residual Fuel Oil

Total demand for residual fuel oil is projected to continue to decline throughout 1991 and 1992. During the first quarter of this year, utility demand was down 34 percent from the same period last year.²² Although part of that decline was weather-related, utilities also drew down their stocks at a much higher rate than that normally observed during the first quarter. On the other hand, first-quarter demand in the nonutility sector increased slightly from the same quarter last year despite continued economic weakness. Industrial fuel prices fell somewhat faster than natural gas prices, possibly leading to higher nonutility demand or to a replenishment of secondary stocks by nonutility customers, accounting for part of the sizable decline in primary stocks. In addition, Persian Gulf-related activity during the first quarter may have also boosted bunker fuel demand.

Total residual fuel oil demand in 1992 in the mid-price and high price cases will continue to decrease because of efficiency trends and because of the continuing substitution of natural gas, especially in the nonutility sector (Tables 6 and 7). For the low price case, demand is expected to rise in 1992 (Table 5). Driving this increase in demand is the lower, and therefore more competitive, residual fuel oil price against natural gas and coal.

Other Petroleum Products

Demand for minor petroleum products held about steady at the 1989 rate in 1990. The impact of increases in industrial and petrochemical activity was offset by

the milder-than-normal weather during the first quarter of the year. Substantial increases in oil-based feedstock demand were offset by declines in consumption of liquefied petroleum gas (LPG) in response to relative price shifts during the first half of the year when oil prices declined.

In 1991, demand for other petroleum products is projected to decline by 2.0 percent in the mid-price case (Table 6). Demand for LPG, however, is projected to rise despite the milder-than-normal temperatures during the first half of the year and declines in petrochemical activity. Transfers from primary to secondary stocks of propane and increases in ethane production resulted in an unusual increase in first-quarter LPG deliveries.²³ The year-to-year declines in oil prices are expected to enable oil-based feedstocks demand to rise slightly during the year. A large decline in miscellaneous products demand projected for 1991 stems from several factors that have reduced year-to-date demand. These factors are precipitous declines in still gas output resulting from reduced refinery runs, reduced asphalt and road oil demand stemming from budgetary constraints and a weak housing market, mild weather that reduced kerosene demand by more than one-third.

The assumption of normal weather as well as a recovery in both manufacturing and chemical output are expected to result in increased demand for the three product groups in 1992. Total demand is projected to climb by 3.6 percent in the mid-price scenario. Boosted by weather-related increases in propane demand, LPG consumption is projected to rise marginally. Demand for petrochemical feedstocks and miscellaneous products are projected to rise rapidly as a result of the robust recovery in industrial production next year.

Outlook for Other Major Energy Sources

Natural Gas

Natural gas consumption is expected to be about 18.8 trillion cubic feet in all of 1991 in the mid-price case, the same level reported for 1990 (Table 10). Generally weak demand in the industrial and electric utility sectors is expected to offset some growth in residential and commercial use due to increases in the number of heating degree-days in the first quarter and (more importantly) in the last quarter of 1991. All sectors are expected to exhibit growth in 1992 as higher heating degree-days (assuming normal weather) pushes demand for gas for heating up (particularly in the first quarter which includes a leap day) and as continued economic expansion increases industrial fuel demand. Total consumption in 1992 is expected to reach 19.4 trillion cubic feet under the mid-price case, which would be the highest annual level for gas use since 1981.²⁴

Gas consumption was up in the first quarter of 1991 compared to the same quarter of 1990, partly because of higher residential and commercial demand, but also because of strong industrial gas use. The latter development occurred despite low activity levels in many industries and is indicative of fuel switching during the high prices and uncertainty of oil supply during the Gulf crisis. With significant recovery in the industrial sector not expected until late this year, and with stable prices and plentiful supplies of fuel oil expected for the rest of 1991, industrial gas demand should not show year-over-year improvement again until early to mid-1992.

The continuing weakness in natural gas prices is due to a combination of a weak economy, relatively abundant supplies, abnormally mild winter weather since late 1989, and resulting high gas inventories. Natural gas wellhead prices (and some end-use gas prices) are expected to remain below 1990 levels in 1991, as gas in storage is at a 6-year high (Table 4 and Figure 12). The abnormally mild weather in the first quarter of 1991 served to reinforce this situation by restricting inventory drawdown. Gas prices are expected to rebound in 1992, however, as the assumptions of normal weather and higher industrial and electric utility activity lead to increased demand.

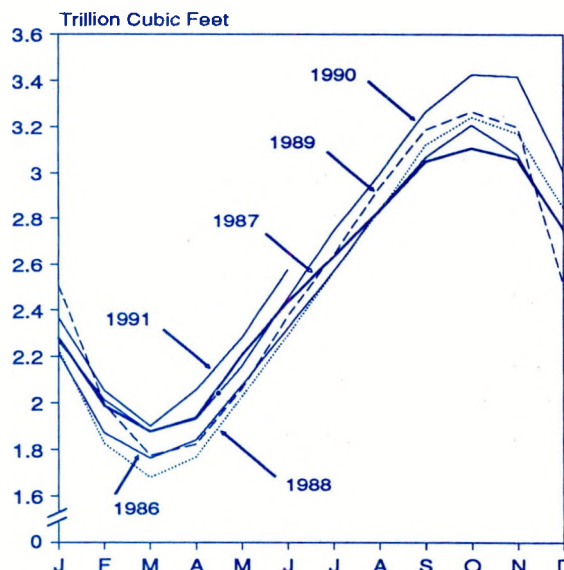


Figure 12. Natural Gas Stocks

Source: Energy Information Administration, *Natural Gas Monthly* (July 1991).

Coal

Coal production is expected to decrease from last year's record level by 2.6 percent (Table 11), but still remain above 1 billion tons. Lower nonutility consumption, reduced exports, and a significant build-up in secondary stocks in 1990 contribute to the decline in production in 1991. Consumption should increase in all sectors, and an expected 3.9-percent increase in coal exports should cause production to increase by 2.5 percent in 1992. Coal prices have been affected by a mild winter, the recession, and a utility stock build-up in 1990.²⁵ Coal prices are expected to be basically flat in 1991 and increase slightly in 1992 (Table 4).

Even though nonutility coal demand is shown to decrease, total coal consumption is expected to increase by 0.2 percent in 1991 (Table 11). Growth in utility coal demand is the reason for this situation. The economic growth forecasted for 1992 should foster growth in the

utility and nonutility sectors. As a result, total coal consumption is expected to increase by 3.5 percent in 1992.

Coal consumption at electric utilities is projected to grow by 1.2 percent for the year 1991 (Figure 13), a rate somewhat higher than the overall rate of growth in electricity generation, partly reflecting expected increases in available coal-based generating potential (in megawatthours) of about 0.9 percent.²⁶ In 1992, a stronger economy and lack of growth in nuclear generation will cause electric utility coal demand to increase by 3.6 percent.

The decline in economic activity in 1991 is expected to cause a substantial reduction in the production of raw steel and result in lower demand for coking coal.²⁷ The expected decrease in coking coal consumption is 15.0 percent in 1991. A stronger economy will cause coal consumption at coke plants to increase by about 9 percent in 1992.

Consumption of coal in the retail and general industry sector is also expected to decline slightly as a result of the sluggish economy in 1991. Demand for coal in this sector should rebound slightly in 1992, to about the annual level reported for 1990.

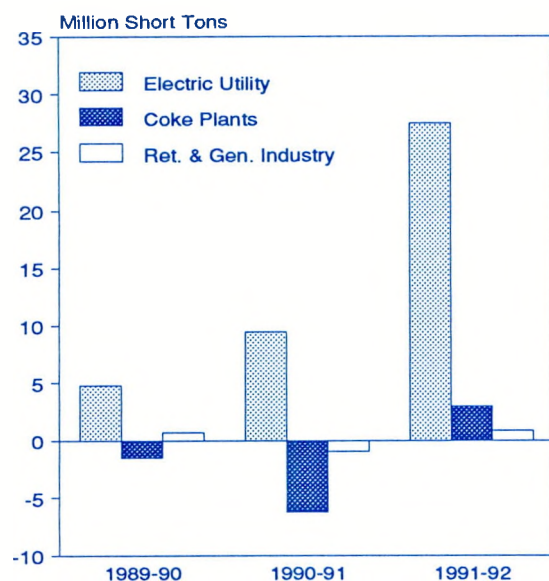


Figure 13. Annual Change in Coal Consumption

Sources: History: Energy Information Administration, *Quarterly Coal Report* (First Quarter 1991). Projections: Table 11.

Electricity

Demand

Total electricity sales are expected to increase by 1.5 percent in 1991, despite the economic recession (Table 12). This pace of growth is lower than in 1990 because of negative growth in the economy this year (Table 2). Temperatures have been both mild (first quarter) and hot (second quarter), resulting in a near normal effect on electricity demand for the entire year. Temperatures in 1990 were mild in both winter and summer months; hence, electricity demand was lower than anticipated. If weather had been normal, electricity sales growth would have been 2.6 percent in 1990 and would be 0.7 percent this year.²⁸ Sales to residential customers are expected to grow steadily and be less affected by the economic recession. Commercial sales growth should slow in 1991 after fairly healthy growth in 1990. The greatest impact of the recession has been, and is expected to continue to be, on the industrial sector. All growth in 1990 in industrial sales is expected to be canceled by a decline this year (Table 12).

Sales of electricity to all end-use sectors are expected to increase at a much faster pace in 1992 than in 1991, or by 3.6 percent (Figure 14). This is caused by an anticipated recovery in the economy, continuing growth in the intensity of electricity use in the residential and commercial sectors, and, to a much lesser extent, a higher number of heating degree-days assumed for the first quarter of 1992 (largely the result of the addition of 1 day in February 1992 caused by the leap year). Industrial sales are expected to turn around and show 3.4-percent growth next year. This growth is tied to an increase in manufacturing output of 4.9 percent (Table 2). Residential and commercial sales are expected to increase by 3.5 and 4.0 percent, respectively.

Supply

Growth in total generation differs from total sales by patterns in nonutility supply and net imports. These two sources are expected to continue increasing through 1992 (Table 12). Nonutility supply growth should maintain a steady pace, while net imports should rebound substantially from the low 1990 level. Increases in nonutility sales are based on recent growth trends and announced orders from nonutility generators. Projections for 1991 net imports are more conservative than in the previous *Outlook* because of low water conditions, recent low demand in New England, and limited transmission access to the

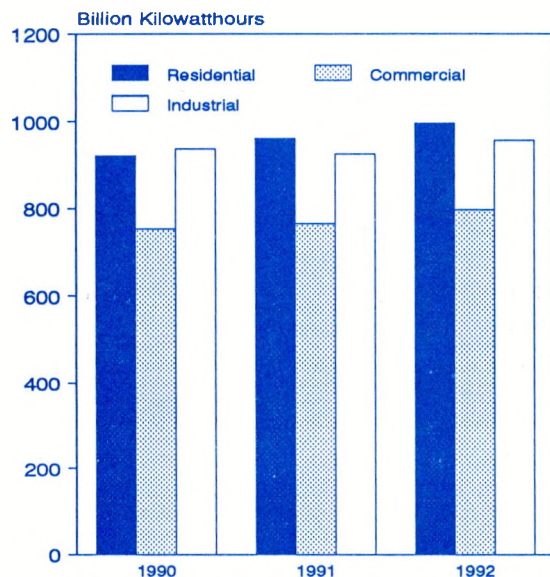


Figure 14. Electricity Sales by Sector

Sources: History: Energy Information Administration, *Electric Power Monthly* (July 1991). Projections: Table 12.

California market. The 1992 import level is based on new contracts becoming effective and continuing improvements in water conditions in Canada.

Increases in generation in 1991 are expected to come primarily from coal; additional capacity is expected to

come on line.²⁹ The assumed continued recovery in hydroelectric power is expected to result in the next greatest amount of additional electricity demand, and nuclear power should pick up remaining demand growth. Increases in nuclear power are based on higher historical utilization of existing units in the first part of 1991, as no new units are expected to become operable during the forecast period. Hydroelectric power projections are based on assumptions of normal precipitation. In 1992, the share of coal use should rise further, as little or no additional net supply may be expected from hydroelectric and nuclear power sources. Hydroelectric output should improve somewhat as dry regions continue to recover. Nuclear generation is expected to remain essentially flat, as utilization rates at nuclear power plants are assumed to be constant and no new capacity will come on line during the forecast period.

Combined use of oil and natural gas at electric utilities is expected to decrease in 1991 because of reduced growth in the demand for electricity, some increases in coal generating capacity, higher net import availability, and larger nonutility supply of electricity. By 1992, higher demand for electricity, a decline in nuclear power, and low growth in hydroelectric power should increase the use of oil and gas somewhat. Despite currently low gas prices, electric utility gas use is not expected to increase for 1991, on average. Significant switching from oil to gas which occurred in late 1990 is not expected to recur this year in the mid-price case, since oil prices are assumed to remain flat and relatively low compared to the situation during the Persian Gulf crisis.

References and Notes

1. The macroeconomic projections were derived from a simulation of the DRI/McGraw-Hill quarterly model of the U.S. Economy in which DRI's June macroeconomic forecast (CONTROL0691) was solved using EIA's assumptions about basic energy prices in the mid price case. The results from this simulation were used to forecast demand in all three oil price scenarios (Tables 5, 6, and 7). This was done for convenience and to provide oil price cases that would not be obscured by the effects of possible macroeconomic feedbacks relating to higher or lower oil prices.
2. "The Outlook." *The Wall Street Journal*. (June 3, 1991.)
3. Quarterly details on interest rates, consumption, and other macroeconomic variables not shown in Table 2 are contained in the macroeconomic simulation done for this *Outlook*, and are available upon request.
4. The changes in oil demand and oil supply between 1989 and 1990 are based on internal calculations by the International and Contingency Information Division of the Office of Energy Markets and End Use.
5. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-27). (Washington, DC, 1991.) Table 13.
6. O'Reilly, Gary. "Gas Price Report." *Natural Gas Week*. (Washington, DC, July 8, 1991.) Table 13.
7. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-27). (Washington, DC, 1991.) Table 11.
8. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-27). (Washington, DC, 1991.) Table 4.
9. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-27). (Washington, DC, 1991.) Table 1.
10. These margin calculations are derived from results from the Unified Demand and Price Analysis Subsystem of the Short-Term Integrated Forecasting System.
11. Energy Information Administration. *Monthly Energy Review*. DOE/EIA-0035(91/07). (Washington, DC, 1991.)
12. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-30). (Washington, DC, 1991.) Table 13.
13. O'Reilly, Gary. "Gas Price Report." *Natural Gas Week*. (Washington, DC, July 8, 1991.)
14. Based on a telephone conversation with an official of Houston Lighting and Power, the utility reports that cutbacks in spot purchases of coal and reductions in output from a coal-based plant in favor of higher purchases of spot gas and higher utilization of gas-based plants had become economic and were continuing in July.
15. The total petroleum range and summarized averages discussed here are based on calculations from the Unified Demand and Price Analysis Subsystem of the Short-Term Integrated Forecasting System.
16. The oil demand sensitivity factors were derived from internal calculations of the Demand Models of the Short-Term Integrated Forecasting System. The oil supply sensitivity was derived implicitly from Tables 5 and 7 and includes uncertainty components not strictly related to price variation.

17. Annual net imports of petroleum products have not been as low as the projected mid-price case for 1991 in the entire period 1973 to 1990, although they fell to 1.05 million barrels per day in 1982. See Energy Information Administration. *Monthly Energy Review*. DOE/EIA-0035(91/07). (Washington, DC, 1991.) Table 3.1b.
18. *Platt's Oilgram Price Report*. Various issues.
19. Total population-weighted heating degree-days increased by 8.2 percent between the first quarter of 1991 and the first quarter of 1990. The same figure for New England was 4.3 percent.
20. Energy Information Administration data on residential sales of heating oil (based on submissions on Form EIA-782) indicate that heating oil sales in the Northeast (Petroleum Administration for Defense Districts 1A and 1B) declined by less than 1,000 barrels per day between the first quarter 1990 and the first quarter 1991.
21. Energy Information Administration. *Weekly Petroleum Status Report*. DOE/EIA-0208(91-28). (Washington, DC, 1991.) Figure 4.
22. Based on internal calculations from the Short-Term Integrated Forecasting System.
23. The source of detailed liquefied petroleum gas and other product information is the Short-Term Integrated Forecasting System database.
24. Energy Information Administration. *Monthly Energy Review*. DOE/EIA-0035(91/07). (Washington, DC, 1991.) Table 4.3.
25. Phelan, K. "Coal Executives See Little Recovery, Consolidation in 1991 Coal Industry." *The Energy Report*. (Arlington, VA, June 10, 1991.)
26. Growth in coal-based generating potential is derived from internal calculations of the Unified Demand and Price Analysis Subsystem of the Short-Term Integrated Forecasting System.
27. Steel production forecasts are produced by using the Coking Coal Demand Model of the Short-Term Integrated Forecasting System.
28. Based on internal calculations from the Electricity Model of the Short-Term Integrated Forecasting System.
29. Based on internal calculations from the Electricity Model of the Short-Term Integrated Forecasting System.

Table 2. Macroeconomic and Weather Assumptions

Assumption	1990				1991		Case	1991		1992				Year			
	1st	2nd	3rd	4th	1st	2nd		3rd	4th	1st	2nd	3rd	4th	1990	1991	1992	
U.S. Macroeconomic ^a																	
Real Gross National Product (billion 1982 dollars)	4151	4155	4170	4153	4126	4133	High	4197	4268	4315	4345	4367	4385		4181	4353	
							Mid	4163	4193	4226	4256	4278	4295	4157	4154	4264	
							Low	4130	4117	4138	4166	4188	4205		4127	4174	
Percentage Change from Prior Year	1.4	1.0	1.0	0.5	-0.6	-0.5	High	0.6	2.8	4.6	5.1	4.1	2.7		0.6	4.1	
							Mid	-0.2	1.0	2.4	3.0	2.8	2.4	0.9	-0.1	2.6	
							Low	-1.0	-0.9	0.3	0.8	1.4	2.1		-0.7	1.1	
GNP Implicit Price Deflator (index, 1982=1.000)	1.295	1.310	1.322	1.331	1.348	1.358	High	1.367	1.373	1.384	1.395	1.406	1.418		1.362	1.401	
							Mid	1.370	1.381	1.393	1.404	1.415	1.428	1.315	1.364	1.410	
							Low	1.373	1.389	1.402	1.413	1.424	1.437		1.367	1.419	
Percentage Change from Prior Year	3.9	4.1	4.2	4.0	4.1	3.7	High	3.4	3.2	2.7	2.7	2.9	3.3		3.7	2.9	
							Mid	3.6	3.8	3.3	3.4	3.3	3.4	4.1	3.8	3.4	
							Low	3.9	4.4	4.0	4.1	3.7	3.5		4.0	3.8	
Real Disposable Personal Income ^b	2901	2903	2898	2872	2860	2861	High	2891	2931	2964	2979	2988	3000		2886	2983	
(billion 1982 dollars)							Mid	2867	2877	2900	2914	2924	2935	2894	2866	2918	
							Low	2843	2822	2836	2850	2859	2870		2847	2854	
Percentage Change from Prior Year	1.3	1.7	0.8	-0.4	-1.4	-1.4	High	-0.2	2.1	3.6	4.1	3.4	2.4		-0.3	3.4	
							Mid	-1.1	0.2	1.4	1.9	2.0	2.0	0.8	-1.0	1.8	
							Low	-1.9	-1.7	-0.8	-0.4	0.6	1.7		-1.6	0.2	
Index of Industrial Production (Mfg.)	1.092	1.102	1.111	1.090	1.060	1.056	High	1.093	1.139	1.162	1.175	1.183	1.189		1.087	1.177	
(index, 1987=1.000)							Mid	1.074	1.094	1.110	1.122	1.130	1.135	1.099	1.071	1.124	
							Low	1.055	1.050	1.057	1.069	1.077	1.081		1.055	1.071	
Percentage Change from Prior Year	0.5	0.8	2.0	0.3	-3.0	-4.2	High	-1.6	4.5	9.6	11.4	8.2	4.4		-1.1	8.3	
							Mid	-3.3	0.4	4.7	6.4	5.2	3.7	0.9	-2.5	4.9	
							Low	-5.0	-3.7	-0.3	1.3	2.1	3.0		-4.0	1.5	
OECD Economic Growth															2.5	1.1	2.7
Weather ^c																	
Heating Degree Days	1970	553	75	1501	2132	430		88	1669	2425	536	88	1669	4099	4319	4719	
Cooling Degree Days	47	335	760	84	56	421		755	63	28	327	755	63	1226	1295	1172	

^aMacroeconomic projections from the Data Resources, Inc., model forecasts are seasonally adjusted at annual rates and modified as appropriate to the mid world oil price case. The mid macroeconomic projections are then modified by the \$16 and \$22 world price cases and by various explicit economic assumptions, with \$16 world oil prices applied to the high macroeconomic case, and \$22 world oil prices applied to the low macroeconomic case.

^bSeasonally adjusted at annual rates.

^cPopulation-weighted average degree days. A degree day indicates the temperature variation from 65 degrees Fahrenheit (calculated as the simple average of the daily minimum and maximum temperatures) weighted by 1980 population.

Note: Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S070991BBB8:26 for the middle oil price case; D070191HLL20:01 and S070591HLL18:12 for the low oil price case; and D070191LHS18:14 and S070591LHS18:18 for the high oil price case.

Source: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, June 1991; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Monthly State, Regional, and National Heating/Cooling Degree Days Weighted by Population*; Federal Reserve System, *Statistical Release G.17(419)* June 1991. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0691.

Table 3. International Petroleum Balance: Mid World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Demand															
OECD															
U.S. (50 States)	17.07	16.95	17.22	16.71	16.43	16.31	16.48	17.10	17.20	16.48	16.73	17.26	16.99	16.58	16.92
U.S. Territories	0.20	0.17	0.20	0.24	0.20	0.22	0.21	0.19	0.20	0.23	0.21	0.20	0.20	0.20	0.21
Canada	1.75	1.68	1.79	1.71	1.60	1.63	1.81	1.90	1.80	1.78	1.86	1.95	1.73	1.74	1.84
Europe*	13.23	12.70	13.05	12.96	13.59	13.06	12.53	13.42	13.50	12.68	12.97	13.77	12.99	13.15	13.23
Japan	5.71	4.64	5.16	5.43	5.96	5.01	4.80	5.61	6.15	4.92	5.11	6.05	5.23	5.34	5.56
Australia and New Zealand	0.80	0.82	0.83	0.78	0.79	0.80	0.79	0.80	0.79	0.82	0.82	0.84	0.81	0.80	0.82
Total OECD	38.76	36.96	38.26	37.84	38.57	37.04	36.62	39.03	39.64	36.91	37.69	40.05	37.95	37.81	38.57
Non-OECD															
U.S.S.R.	8.96	8.20	7.95	8.90	8.74	7.92	7.77	7.95	8.10	7.68	7.53	7.70	8.50	8.09	7.75
China	2.39	2.39	2.29	2.19	2.28	2.34	2.39	2.39	2.33	2.39	2.44	2.44	2.31	2.35	2.40
Europe	1.75	1.67	1.50	1.58	1.55	1.48	1.42	1.49	1.52	1.45	1.40	1.47	1.62	1.48	1.46
Other Non-OECD	15.71	15.31	15.65	16.00	16.25	15.88	15.95	16.56	16.63	16.53	16.57	17.27	15.67	16.16	16.75
Total Non-OECD	28.81	27.56	27.39	28.66	28.83	27.62	27.52	28.39	28.58	28.04	27.94	28.88	28.10	28.09	28.36
Total World	67.57	64.52	65.64	66.50	67.39	64.65	64.14	67.41	68.22	64.95	65.62	68.93	66.05	65.90	66.93
Supply^b															
OECD															
U.S. (50 States)	9.81	9.51	9.53	9.87	9.90	9.74	9.64	9.71	9.64	9.50	9.41	9.50	9.68	9.75	9.51
Canada	2.00	1.96	1.94	2.01	2.04	1.83	1.85	1.88	1.90	1.90	1.90	1.90	1.98	1.90	1.90
North Sea ^c	3.91	3.90	3.51	3.93	4.06	3.66	3.99	4.38	4.47	4.01	4.27	4.47	3.81	4.02	4.31
Other OECD	1.42	1.45	1.51	1.49	1.46	1.46	1.46	1.46	1.44	1.44	1.44	1.44	1.47	1.46	1.44
Total OECD	17.14	16.81	16.48	17.29	17.45	16.70	16.94	17.43	17.45	16.85	17.02	17.31	16.93	17.13	17.16
Non-OECD															
OPEC	25.28	25.48	23.89	25.02	24.91	24.43	25.00	25.25	25.10	25.30	25.50	25.70	24.91	24.90	25.40
U.S.S.R.	11.90	11.65	11.29	10.90	10.77	10.56	10.52	10.44	9.99	9.79	9.75	9.67	11.43	10.57	9.80
China	2.78	2.75	2.76	2.78	2.76	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.77	2.79	2.80
Mexico	2.95	2.92	2.99	3.14	3.15	3.12	3.12	3.12	3.16	3.16	3.16	3.16	3.00	3.13	3.16
Other Non-OECD	7.36	7.40	7.40	7.50	7.58	7.61	7.67	7.71	7.82	7.88	7.93	7.99	7.42	7.64	7.90
Total Non-OECD	50.26	50.20	48.34	49.34	49.17	48.51	49.11	49.32	48.87	48.92	49.13	49.31	49.53	49.03	49.06
Total World	67.40	67.00	64.82	66.63	66.62	65.21	66.05	66.75	66.32	65.76	66.15	66.62	66.46	66.16	66.22
Stock Changes and Statistical Discrepancy															
Net Stock Withdrawals or Additions (-)															
U.S. (50 States including SPR)	-0.67	-0.47	-0.14	0.84	0.69	-0.92	-0.17	0.31	0.39	-0.51	-0.30	0.33	-0.11	-0.02	-0.02
Other	-0.25	-0.90	0.52	-1.24	-0.08	-0.17	-2.01	0.06	1.21	-0.61	-0.51	1.68	-0.46	-0.55	0.44
Total Stock Withdrawals	-0.92	-1.37	0.38	-0.39	0.61	-1.09	-2.18	0.37	1.60	-1.11	-0.81	2.01	-0.57	-0.58	0.42
Statistical Discrepancy	1.08	-1.11	0.44	0.26	0.16	0.54	0.28	0.29	0.30	0.30	0.29	0.29	0.16	0.32	0.29
Closing Stocks (billion barrels)^d	5.42	5.54	5.51	5.54	5.49	5.59	5.79	5.75	5.61	5.71	5.78	5.60	5.54	5.75	5.60
Market Economies Demand*	54.15	51.95	53.59	53.51	54.54	52.64	52.28	55.30	56.01	53.17	53.99	57.06	53.30	53.69	55.06
Net Exports from Former CPE	1.69	2.27	2.43	1.12	1.11	1.77	1.90	1.56	1.00	1.24	1.35	1.05	1.88	1.59	1.16

*OECD Europe includes eastern Germany.

^bIncludes production of crude oil (including lease condensates), natural gas plant liquids, other hydrogen and hydrocarbons for refinery feedstocks, refinery gains, alcohol, and liquids produced from coal and other sources.

^cIncludes offshore supply from Denmark, Germany, the Netherlands, Norway, and the United Kingdom.

^dExcludes stocks held in the Former CPE (defined below).

*Excludes demand from the Former CPE (defined below).

Former CPE: Albania, Bulgaria, Cambodia, China, Cuba, Czechoslovakia, Hungary, Laos, Mongolia, North Korea, Poland, Romania, the Union of Soviet Socialist Republics, Vietnam, and Yugoslavia.

OECD: Organization for Economic Cooperation and Development

OPEC: Organization of Petroleum Exporting Countries

SPR: Strategic Petroleum Reserve

Notes: Minor discrepancies with other published EIA historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case.

Sources: Energy Information Administration, *International Petroleum Statistics Report*, DOE/EIA-0529(91/06); and *International Energy Annual 1989*, DOE/EIA-0219(89); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through December 1990.

Table 4. Energy Prices
(Nominal Dollars)

Product	1990				1991		Price Range	1991		1992				Year		
	1st	2nd	3rd	4th	1st	2nd		3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Imported Crude Oil Price*																
(dollars per barrel)	19.76	15.85	23.16	29.71	19.40	18.13	Low	16.00	16.00	16.00	16.00	16.00	16.00		17.29	16.00
							Mid	19.00	20.00	20.00	20.00	20.00	21.00	21.78	19.12	20.25
							High	22.00	22.00	22.00	22.00	22.00	23.00		20.39	22.25
Natural Gas Wellhead Price																
(dollars per thousand cubic feet)	1.88	1.49	1.53	1.95	1.68	1.43	Low	1.60	1.85	1.72	1.42	1.65	1.93		1.60	1.69
							Mid	1.65	1.99	1.89	1.58	1.76	2.15	1.72	1.69	1.85
							High	1.80	2.15	2.00	1.69	1.94	2.28		1.78	1.98
Petroleum Products																
Gasoline^b																
(dollars per gallon)	1.08	1.12	1.24	1.42	1.21	1.19	Low	1.17	1.13	1.09	1.16	1.19	1.17		1.18	1.15
							Mid	1.22	1.21	1.17	1.25	1.28	1.27	1.22	1.21	1.24
							High	1.27	1.27	1.22	1.30	1.33	1.32		1.23	1.29
No. 2 Diesel Oil, Retail																
(dollars per gallon)	1.10	1.00	1.17	1.39	1.20	1.11	Low	1.03	1.08	1.09	1.06	1.06	1.11		1.10	1.08
							Mid	1.12	1.20	1.21	1.18	1.18	1.26	1.17	1.15	1.20
							High	1.18	1.24	1.24	1.21	1.22	1.30		1.18	1.24
No. 2 Heating Oil, Wholesale																
(dollars per gallon)	0.63	0.54	0.70	0.89	0.69	0.59	Low	0.50	0.53	0.55	0.51	0.50	0.54		0.55	0.52
							Mid	0.57	0.63	0.65	0.61	0.60	0.66	0.70	0.61	0.63
							High	0.65	0.68	0.70	0.66	0.65	0.71		0.65	0.68
No. 2 Heating Oil, Retail																
(dollars per gallon)	1.03	0.91	1.01	1.22	1.11	0.94	Low	0.87	0.93	0.96	0.92	0.88	0.95		1.01	0.94
							Mid	0.93	1.02	1.06	1.02	0.98	1.07	1.06	1.04	1.05
							High	0.99	1.08	1.12	1.08	1.03	1.12		1.07	1.11
No. 6 Residual Fuel Oil^c																
(dollars per barrel)	19.27	14.03	17.41	24.41	17.50	13.04	Low	12.18	13.94	14.78	14.00	14.15	15.17		14.25	14.56
							Mid	14.53	17.17	18.00	16.96	17.03	19.02	18.64	15.65	17.81
							High	16.47	18.45	19.31	18.29	18.36	20.46		16.41	19.17
Electric Utility Fuels																
Coal																
(dollars per million Btu)	1.46	1.47	1.44	1.44	1.46	1.46	Low	1.43	1.42	1.42	1.43	1.41	1.40		1.44	1.41
							Mid	1.45	1.45	1.47	1.49	1.47	1.48	1.45	1.46	1.48
							High	1.47	1.49	1.51	1.54	1.53	1.55		1.47	1.53
Heavy Oil^d																
(dollars per million Btu)	3.49	2.38	3.12	4.31	2.91	2.04	Low	1.90	2.26	2.38	2.20	2.22	2.46		2.28	2.32
							Mid	2.27	2.78	2.90	2.66	2.67	3.08	3.22	2.50	2.84
							High	2.57	2.99	3.11	2.86	2.88	3.32		2.63	3.05
Natural Gas																
(dollars per million Btu)	2.62	2.14	2.15	2.60	2.40	1.94	Low	2.03	2.40	2.48	2.11	2.21	2.58		2.16	2.32
							Mid	2.08	2.50	2.59	2.21	2.30	2.71	2.32	2.20	2.43
							High	2.23	2.67	2.76	2.37	2.46	2.88		2.31	2.59
Other Residential																
Natural Gas																
(dollars per thousand cubic feet)	5.53	5.91	6.96	5.70	5.56	5.94	Low	6.96	5.79	5.66	6.10	7.27	6.08		5.81	5.98
							Mid	7.10	5.95	5.84	6.30	7.52	6.29	5.77	5.86	6.17
							High	7.31	6.17	6.08	6.59	7.87	6.58		5.94	6.45
Electricity																
(cents per kilowatthour)	7.4	7.9	8.2	7.8	7.6	8.2	Mid	8.4	8.0	7.7	8.3	8.6	8.1	7.8	8.0	8.2

*Cost of imported crude oil to U.S. refiners.

^bAverage retail for all grades and services.

^cRetail residual fuel oil-average, all sulfur contents.

^dHeavy fuel oil prices include fuel oils No. 4, No. 5, and No. 6, and topped crude fuel oil prices.

Notes: Second quarter 1991 is estimated. Prices exclude taxes, except gasoline, residential natural gas, and diesel prices. Price ranges are derived by simulating all energy product price models in STIFS under the assumptions of: \$16 world oil prices (low price), \$20 world oil prices (mid price), and \$22 world oil prices (high price), with macroeconomic and weather assumptions kept as in the mid case for all cases. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071091BBB18:26 for the middle oil price case; D070191HLL20:01 and S071091HLL19:25 for the low oil price case; and D070191LHS18:14 and S071091LHS19:32 for the high oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); and *Petroleum Marketing Monthly*, DOE/EIA-0380(91/07).

Table 5. Supply and Disposition of Petroleum: Low World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Supply															
Crude Oil Supply															
Domestic Production ^a	7.49	7.28	7.23	7.42	7.48	7.39	7.18	7.14	7.08	6.92	6.76	6.75	7.36	7.29	6.87
Alaska	1.84	1.73	1.71	1.82	1.88	1.78	1.71	1.75	1.73	1.68	1.62	1.64	1.77	1.78	1.67
Lower 48	5.65	5.55	5.52	5.60	5.60	5.60	5.47	5.39	5.34	5.23	5.15	5.10	5.58	5.51	5.21
Net Imports (Including SPR) ^b	5.96	6.13	6.26	4.81	5.19	5.90	6.01	5.89	6.09	6.46	6.77	6.49	5.79	5.75	6.45
Gross Imports (Excluding SPR)	6.05	6.18	6.30	4.94	5.30	6.04	6.09	6.02	6.21	6.59	6.85	6.63	5.87	5.87	6.57
SPR Imports	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Exports	0.12	0.10	0.07	0.13	0.11	0.14	0.08	0.14	0.12	0.13	0.08	0.14	0.11	0.12	0.12
SPR Stock Withdrawn or Added (-)	-0.03	-0.05	-0.03	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.05	0.00
Other Stock Withdrawn or Added (-)	-0.33	-0.15	0.45	0.22	-0.16	-0.18	0.16	-0.01	-0.07	-0.03	0.07	0.03	0.05	-0.05	0.00
Product Supplied and Losses	-0.03	-0.03	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude	0.22	0.19	0.27	0.35	0.18	0.39	0.13	0.15	0.15	0.15	0.14	0.14	0.26	0.21	0.15
Crude Oil Input to Refineries	13.28	13.38	14.15	12.83	12.86	13.48	13.45	13.14	13.22	13.47	13.72	13.39	13.41	13.23	13.45
Other Supply															
NGL Production	1.55	1.48	1.55	1.65	1.66	1.63	1.59	1.62	1.63	1.61	1.59	1.62	1.56	1.63	1.61
Other Hydrocarbon and Alcohol Inputs	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.11	0.10	0.10	0.15	0.20	0.08	0.09	0.14
Crude Oil Product Supplied	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.69	0.65	0.68	0.71	0.67	0.65	0.67	0.67	0.65	0.68	0.69	0.68	0.68	0.67	0.67
Net Product Imports ^c	1.76	1.60	1.31	0.84	0.44	1.20	1.09	1.36	1.28	1.23	1.11	1.25	1.38	1.03	1.22
Gross Product Imports ^c	2.44	2.25	2.03	1.78	1.52	1.84	1.75	2.12	1.94	1.88	1.77	2.01	2.12	1.81	1.90
Product Exports	0.68	0.65	0.72	0.94	1.07	0.64	0.66	0.76	0.66	0.65	0.66	0.76	0.75	0.78	0.68
Product Stock Withdrawn or Added (-) ^d	-0.32	-0.28	-0.56	0.58	0.65	-0.74	-0.35	0.30	0.45	-0.47	-0.36	0.28	-0.14	-0.04	-0.03
Total Product Supplied, Domestic Use	17.07	16.95	17.22	16.71	16.40	16.31	16.55	17.22	17.35	16.63	16.92	17.44	16.99	16.62	17.09
Disposition															
Motor Gasoline	7.05	7.33	7.41	7.15	6.83	7.30	7.33	7.23	6.95	7.30	7.35	7.24	7.23	7.17	7.21
Jet Fuel	1.52	1.50	1.50	1.57	1.50	1.39	1.40	1.49	1.48	1.43	1.47	1.54	1.52	1.45	1.48
Distillate Fuel Oil	3.24	2.95	2.94	2.95	3.11	2.83	2.68	3.25	3.58	2.97	2.81	3.33	3.02	2.97	3.17
Residual Fuel Oil	1.42	1.23	1.18	1.10	1.19	1.15	1.03	1.22	1.33	1.05	1.11	1.24	1.23	1.15	1.18
Other Oils Supplied ^e	3.84	3.93	4.20	3.94	3.79	3.64	4.10	4.05	4.01	3.89	4.18	4.09	3.98	3.89	4.04
Total Product Supplied	17.07	16.95	17.22	16.71	16.43	16.31	16.55	17.22	17.35	16.63	16.92	17.44	16.99	16.63	17.09
Total Petroleum Net Imports	7.72	7.73	7.57	5.64	5.63	7.10	7.10	7.25	7.37	7.69	7.88	7.74	7.16	6.78	7.67
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	371	384	343	323	337	353	339	339	346	349	343	340	323	339	340
Total Motor Gasoline	227	213	229	220	211	217	229	230	231	226	234	233	220	230	233
Finished Motor Gasoline	186	176	188	181	173	177	184	188	188	185	188	189	181	188	189
Blending Components	42	37	41	39	39	40	45	43	43	42	45	44	39	43	44
Jet Fuel	49	47	50	52	45	48	50	48	47	48	50	48	52	48	48
Distillate Fuel Oil	99	110	136	132	98	114	127	134	105	112	127	136	132	134	136
Residual Fuel Oil	46	47	49	49	43	46	44	43	43	46	46	44	49	43	44
Other Oils ^g	267	298	302	260	257	295	303	272	259	296	305	274	260	272	274
Total Stocks (Excluding SPR)	1060	1098	1109	1035	990	1074	1092	1065	1032	1078	1104	1076	1035	1065	1076
Crude Oil in SPR	582	587	590	586	568	568	568	568	568	568	568	568	586	568	568
Total Stocks (Including SPR)	1642	1685	1698	1621	1559	1642	1660	1634	1600	1646	1673	1644	1621	1634	1644

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.

^fIncludes crude oil in transit to refineries.

^gIncludes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.

SPR: Strategic Petroleum Reserve

NGL: Natural Gas Liquids

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BSB20:01 and S071991BSB17:12 for the low oil price case.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1989*, DOE/EIA-0340(89)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1991 to April 1991; and *Weekly Petroleum Status Report*, DOE/EIA-0208(91-24,25,29).

Table 6. Supply and Disposition of Petroleum: Mid World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Supply															
Crude Oil Supply															
Domestic Production ^a	7.49	7.28	7.23	7.42	7.48	7.39	7.30	7.30	7.26	7.11	6.98	7.00	7.36	7.37	7.09
Alaska	1.84	1.73	1.71	1.82	1.88	1.78	1.73	1.77	1.75	1.71	1.65	1.69	1.77	1.79	1.70
Lower 48	5.65	5.55	5.52	5.60	5.60	5.60	5.57	5.53	5.50	5.41	5.34	5.31	5.58	5.58	5.39
Net Imports (Including SPR) ^b	5.96	6.13	6.26	4.81	5.19	5.90	5.84	5.64	5.80	6.14	6.48	6.09	5.79	5.64	6.13
Gross Imports (Excluding SPR)	6.05	6.18	6.30	4.94	5.30	6.04	5.92	5.78	5.92	6.27	6.56	6.23	5.87	5.76	6.25
SPR Imports	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Exports	0.12	0.10	0.07	0.13	0.11	0.14	0.08	0.14	0.12	0.13	0.08	0.14	0.11	0.12	0.12
SPR Stock Withdrawn or Added (-)	-0.03	-0.05	-0.03	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.05	0.00
Other Stock Withdrawn or Added (-)	-0.33	-0.15	0.45	0.22	-0.16	-0.18	0.17	0.00	-0.07	-0.03	0.07	0.03	0.05	-0.04	0.00
Product Supplied and Losses	-0.03	-0.03	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude	0.22	0.19	0.27	0.35	0.18	0.39	0.13	0.14	0.15	0.15	0.14	0.14	0.26	0.21	0.14
Crude Oil Input to Refineries	13.28	13.38	14.15	12.83	12.86	13.48	13.40	13.07	13.11	13.36	13.65	13.24	13.41	13.20	13.34
Other Supply															
NGL Production	1.55	1.48	1.55	1.65	1.66	1.63	1.59	1.62	1.63	1.62	1.60	1.63	1.56	1.63	1.62
Other Hydrocarbon and Alcohol Inputs	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.11	0.10	0.10	0.15	0.20	0.08	0.09	0.14
Crude Oil Product Supplied	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.69	0.65	0.68	0.71	0.67	0.65	0.67	0.67	0.65	0.67	0.68	0.68	0.68	0.66	0.67
Net Product Imports ^c	1.76	1.60	1.31	0.84	0.44	1.20	1.05	1.29	1.22	1.19	1.00	1.19	1.38	1.00	1.15
Gross Product Imports ^c	2.44	2.25	2.03	1.78	1.52	1.84	1.71	2.05	1.88	1.84	1.66	1.95	2.12	1.78	1.84
Product Exports	0.68	0.65	0.72	0.94	1.07	0.64	0.66	0.76	0.66	0.65	0.66	0.76	0.75	0.78	0.68
Product Stock Withdrawn or Added (-) ^d	-0.32	-0.28	-0.56	0.58	0.65	-0.74	-0.33	0.31	0.47	-0.48	-0.37	0.30	-0.14	-0.03	-0.02
Total Product Supplied, Domestic Use	17.07	16.95	17.22	16.71	16.40	16.31	16.48	17.10	17.20	16.48	16.73	17.26	16.99	16.57	16.92
Disposition															
Motor Gasoline	7.05	7.33	7.41	7.15	6.83	7.30	7.31	7.19	6.90	7.25	7.30	7.19	7.23	7.16	7.16
Jet Fuel	1.52	1.50	1.50	1.57	1.50	1.39	1.40	1.49	1.48	1.43	1.47	1.54	1.52	1.45	1.48
Distillate Fuel Oil	3.24	2.95	2.94	2.95	3.11	2.83	2.66	3.21	3.54	2.93	2.77	3.29	3.02	2.95	3.13
Residual Fuel Oil	1.42	1.23	1.18	1.10	1.19	1.15	1.00	1.16	1.26	0.99	1.01	1.15	1.23	1.13	1.10
Other Oils Supplied ^e	3.84	3.93	4.20	3.94	3.79	3.64	4.11	4.06	4.01	3.89	4.17	4.10	3.98	3.90	4.04
Total Product Supplied	17.07	16.95	17.22	16.71	16.43	16.31	16.48	17.10	17.20	16.48	16.73	17.26	16.99	16.58	16.92
Total Petroleum Net Imports	7.72	7.73	7.57	5.64	5.63	7.10	6.89	6.94	7.02	7.34	7.48	7.28	7.16	6.64	7.28
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	371	384	343	323	337	353	338	338	344	347	341	338	323	338	338
Total Motor Gasoline	227	213	229	220	211	217	228	229	230	225	233	232	220	229	232
Finished Motor Gasoline	186	176	188	181	173	177	183	186	187	183	187	188	181	186	188
Blending Components	42	37	41	39	39	40	45	43	43	42	46	44	39	43	44
Jet Fuel	49	47	50	52	45	48	50	47	47	48	50	48	52	47	48
Distillate Fuel Oil	99	110	136	132	98	114	125	132	104	111	125	134	132	132	134
Residual Fuel Oil	46	47	49	49	43	46	44	43	42	45	45	44	49	43	44
Other Oils ^g	267	298	302	260	257	295	304	272	258	295	305	274	260	272	274
Total Stocks (Excluding SPR)	1060	1098	1109	1035	990	1074	1089	1061	1025	1071	1099	1069	1035	1061	1069
Crude Oil In SPR	582	587	590	586	568	568	568	568	568	568	568	568	586	568	568
Total Stocks (Including SPR)	1642	1685	1698	1621	1559	1642	1658	1629	1594	1640	1667	1637	1621	1629	1637

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.

^fIncludes crude oil in transit to refineries.

^gIncludes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.

SPR: Strategic Petroleum Reserve

NGL: Natural Gas Liquids

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1989*, DOE/EIA-0340(89)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1991 to April 1991; and *Weekly Petroleum Status Report*, DOE/EIA-0208(91-24,25,29).

Table 7. Supply and Disposition of Petroleum: High World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Supply															
Crude Oil Supply															
Domestic Production ^a	7.49	7.28	7.23	7.42	7.48	7.39	7.43	7.45	7.42	7.28	7.17	7.21	7.36	7.44	7.27
Alaska	1.84	1.73	1.71	1.82	1.88	1.78	1.79	1.84	1.83	1.78	1.72	1.78	1.77	1.82	1.78
Lower 48	5.65	5.55	5.52	5.60	5.60	5.60	5.64	5.61	5.59	5.51	5.46	5.44	5.58	5.61	5.50
Net Imports (Including SPR) ^b	5.96	6.13	6.26	4.81	5.19	5.90	5.65	5.43	5.54	5.87	6.20	5.77	5.79	5.54	5.85
Gross Imports (Excluding SPR)	6.05	6.18	6.30	4.94	5.30	6.04	5.73	5.57	5.66	6.00	6.28	5.91	5.87	5.66	5.96
SPR Imports	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
Exports	0.12	0.10	0.07	0.13	0.11	0.14	0.08	0.14	0.12	0.13	0.08	0.14	0.11	0.12	0.12
SPR Stock Withdrawn or Added (-)	-0.03	-0.05	-0.03	0.04	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.05	0.00
Other Stock Withdrawn or Added (-)	-0.33	-0.15	0.45	0.22	-0.16	-0.18	0.18	0.00	-0.07	-0.03	0.07	0.03	0.05	-0.04	0.00
Product Supplied and Losses	-0.03	-0.03	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude	0.22	0.19	0.27	0.35	0.18	0.39	0.12	0.14	0.15	0.15	0.14	0.14	0.26	0.21	0.14
Crude Oil Input to Refineries	13.28	13.38	14.15	12.83	12.86	13.48	13.37	13.00	13.02	13.25	13.56	13.13	13.41	13.18	13.24
Other Supply															
NGL Production	1.55	1.48	1.55	1.65	1.66	1.63	1.60	1.63	1.63	1.62	1.60	1.63	1.56	1.63	1.62
Other Hydrocarbon and Alcohol Inputs	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.11	0.10	0.10	0.15	0.20	0.08	0.09	0.14
Crude Oil Product Supplied	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.69	0.65	0.68	0.71	0.67	0.65	0.67	0.67	0.65	0.67	0.68	0.67	0.68	0.66	0.67
Net Product Imports ^c	1.76	1.60	1.31	0.84	0.44	1.20	1.00	1.25	1.19	1.19	0.97	1.17	1.38	0.97	1.13
Gross Product Imports ^c	2.44	2.25	2.03	1.78	1.52	1.84	1.65	2.01	1.85	1.84	1.63	1.93	2.12	1.76	1.81
Product Exports	0.68	0.65	0.72	0.94	1.07	0.64	0.66	0.76	0.66	0.65	0.66	0.76	0.75	0.78	0.68
Product Stock Withdrawn or Added (-) ^d	-0.32	-0.28	-0.56	0.58	0.65	-0.74	-0.31	0.32	0.48	-0.47	-0.37	0.31	-0.14	-0.02	-0.01
Total Product Supplied, Domestic Use	17.07	16.95	17.22	16.71	16.40	16.31	16.42	17.00	17.09	16.37	16.60	17.13	16.99	16.53	16.80
Disposition															
Motor Gasoline	7.05	7.33	7.41	7.15	6.83	7.30	7.29	7.16	6.88	7.23	7.28	7.16	7.23	7.15	7.14
Jet Fuel	1.52	1.50	1.50	1.57	1.50	1.39	1.40	1.48	1.48	1.42	1.46	1.53	1.52	1.44	1.48
Distillate Fuel Oil	3.24	2.95	2.94	2.95	3.11	2.83	2.63	3.17	3.49	2.88	2.72	3.22	3.02	2.94	3.07
Residual Fuel Oil	1.42	1.23	1.18	1.10	1.19	1.15	0.97	1.13	1.23	0.96	0.97	1.11	1.23	1.11	1.07
Other Oils Supplied ^e	3.84	3.93	4.20	3.94	3.79	3.64	4.11	4.06	4.02	3.89	4.17	4.10	3.98	3.90	4.05
Total Product Supplied	17.07	16.95	17.22	16.71	16.43	16.31	16.42	17.00	17.09	16.37	16.60	17.13	16.99	16.54	16.80
Total Petroleum Net Imports	7.72	7.73	7.57	5.64	5.63	7.10	6.65	6.67	6.73	7.06	7.17	6.94	7.16	6.52	6.97
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	371	384	343	323	337	353	337	337	343	346	339	337	323	337	337
Total Motor Gasoline	227	213	229	220	211	217	228	228	229	224	232	231	220	228	231
Finished Motor Gasoline	186	176	188	181	173	177	183	186	186	183	187	187	181	186	187
Blending Components	42	37	41	39	39	40	45	43	43	42	46	44	39	43	44
Jet Fuel	49	47	50	52	45	48	50	47	46	48	50	47	52	47	47
Distillate Fuel Oil	99	110	136	132	98	114	124	130	102	109	123	131	132	130	131
Residual Fuel Oil	46	47	49	49	43	46	44	43	42	44	44	43	49	43	43
Other Oils ^g	267	298	302	260	257	295	304	271	257	294	305	273	260	271	273
Total Stocks (Excluding SPR)	1060	1098	1109	1035	990	1074	1086	1057	1020	1065	1093	1062	1035	1057	1062
Crude Oil in SPR	582	587	590	586	568	568	568	568	568	568	568	568	586	568	568
Total Stocks (Including SPR)	1642	1685	1698	1621	1559	1642	1655	1625	1588	1634	1661	1631	1621	1625	1631

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.

^fIncludes crude oil in transit to refineries.

^gIncludes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.

SPR: Strategic Petroleum Reserve

NGL: Natural Gas Liquids

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BGB18:14 and S071991BGB17:21 for the high oil price case.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1989*, DOE/EIA-0340(89)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1991 to April 1991; and *Weekly Petroleum Status Report*, DOE/EIA-0208(91-24,25,29).

Table 8. Petroleum Demand Sensitivities

Demand Determinant	1991	1992
	Two Quarters	Four Quarters
Economic Activity		
Level of GNP ^a	4,124 - 4,233	4,174 - 4,353
Resulting Petroleum Demand Difference ^b	0.29	0.54
Energy Prices		
Crude Oil ^c	\$16 - \$22	\$16 - \$22.25
Resulting Petroleum Demand Difference ^b		
All Energy Prices Change18	.26
Only Oil Prices Change18	.29
Weather		
Heating Degree Days ^d	1,620 - 1,984	4,388 - 5,226
Cooling Degree Days ^d	758 - 912	1,096 - 1,306
Resulting Petroleum Demand Difference ^b26	.38

^aReal gross national product, in billion 1982 dollar per year.

^bPetroleum demand ranges associated with varying each demand determinant (ro set of demand determinants), holding other things equal, in million barrels per day.

^cRefiners' acquisition cost of import oil, in current dollars per barrel.

^dHeating and cooling degree days shown are national population-weighted.

Source: Energy Information Administration, Office of Energy Markets and End Use, Short-Term Integrated Forecasting System.

Table 9. Crude Oil Production Forecast Components
(Million Barrels per Day)

	High Price Case	Low Price Case	Difference		
			Total	Uncertainty	Price Impact
United States	7.21	6.75	.46	.14	.32
Lower 48 States	5.44	5.10	.33	.11	.22
Alaska	1.78	1.64	.13	.03	.10

Note: Components provided are for the fourth quarter 1992. (Compare tables 5 and 7 on pages 21 and 23.) Totals may not add to sum of components due to independent rounding.

Source: EIA, Office of Oil and Gas, Reserves and Natural Gas Division.

Table 10. Supply and Disposition of Natural Gas: Mid World Oil Price Case
(Trillion Cubic Feet)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Supply															
Total Dry Gas Production ^a	4.55	4.29	4.24	4.54	4.50	<i>4.31</i>	<i>4.10</i>	<i>4.52</i>	<i>4.60</i>	<i>4.38</i>	<i>4.15</i>	<i>4.56</i>	17.61	<i>17.43</i>	<i>17.69</i>
Net Imports	0.36	0.32	0.33	0.41	0.38	<i>0.37</i>	<i>0.34</i>	<i>0.39</i>	<i>0.45</i>	<i>0.39</i>	<i>0.37</i>	<i>0.41</i>	1.41	<i>1.48</i>	<i>1.62</i>
Supplemental Gaseous Fuels	0.03	0.02	0.03	0.03	0.03	<i>0.02</i>	<i>0.02</i>	<i>0.03</i>	<i>0.03</i>	<i>0.02</i>	<i>0.02</i>	<i>0.03</i>	0.11	<i>0.10</i>	<i>0.10</i>
Total New Supply	4.93	4.63	4.59	4.97	4.92	<i>4.71</i>	<i>4.46</i>	<i>4.93</i>	<i>5.08</i>	<i>4.80</i>	<i>4.54</i>	<i>4.99</i>	19.13	<i>19.02</i>	<i>19.41</i>
Underground Working Gas Storage															
Opening	2.51	1.88	2.45	3.27	3.01	<i>1.90</i>	<i>2.58</i>	<i>3.42</i>	<i>3.03</i>	<i>1.93</i>	<i>2.52</i>	<i>3.37</i>	2.51	<i>3.01</i>	<i>3.03</i>
Closing	1.88	2.45	3.27	3.01	1.90	<i>2.58</i>	<i>3.42</i>	<i>3.03</i>	<i>1.93</i>	<i>2.52</i>	<i>3.37</i>	<i>2.98</i>	3.01	<i>3.03</i>	<i>2.98</i>
Net Withdrawals ^b	0.63	-0.57	-0.83	0.25	1.04	<i>-0.63</i>	<i>-0.84</i>	<i>0.39</i>	<i>1.10</i>	<i>-0.60</i>	<i>-0.84</i>	<i>0.39</i>	-0.52	<i>-0.05</i>	<i>0.05</i>
Total Supply ^a	5.57	4.06	3.76	5.22	5.96	<i>4.07</i>	<i>3.62</i>	<i>5.32</i>	<i>6.18</i>	<i>4.21</i>	<i>3.70</i>	<i>5.38</i>	18.61	<i>18.97</i>	<i>19.46</i>
Balancing Item ^c	0.18	0.24	0.11	-0.34	0.17	<i>0.11</i>	<i>-0.09</i>	<i>-0.38</i>	<i>0.02</i>	<i>0.25</i>	<i>-0.03</i>	<i>-0.35</i>	0.19	<i>-0.20</i>	<i>-0.11</i>
Total Primary Supply ^a	5.75	4.30	3.87	4.88	6.13	<i>4.18</i>	<i>3.53</i>	<i>4.93</i>	<i>6.20</i>	<i>4.45</i>	<i>3.67</i>	<i>5.03</i>	18.80	<i>18.78</i>	<i>19.36</i>
Consumption															
Lease and Plant Fuel	0.32	0.30	0.29	0.31	0.31	<i>0.28</i>	<i>0.27</i>	<i>0.31</i>	<i>0.30</i>	<i>0.32</i>	<i>0.28</i>	<i>0.32</i>	1.21	<i>1.17</i>	<i>1.21</i>
Pipeline Use	0.15	0.14	0.15	0.14	0.16	<i>0.15</i>	<i>0.13</i>	<i>0.15</i>	<i>0.14</i>	<i>0.15</i>	<i>0.13</i>	<i>0.15</i>	0.57	<i>0.59</i>	<i>0.58</i>
Residential	1.98	0.81	0.38	1.21	2.09	<i>0.80</i>	<i>0.37</i>	<i>1.29</i>	<i>2.29</i>	<i>0.86</i>	<i>0.38</i>	<i>1.31</i>	4.37	<i>4.56</i>	<i>4.85</i>
Commercial	1.04	0.52	0.36	0.71	1.10	<i>0.52</i>	<i>0.33</i>	<i>0.73</i>	<i>1.19</i>	<i>0.56</i>	<i>0.34</i>	<i>0.75</i>	2.62	<i>2.68</i>	<i>2.83</i>
Industrial	1.81	1.80	1.73	1.90	1.96	<i>1.74</i>	<i>1.57</i>	<i>1.82</i>	<i>1.74</i>	<i>1.87</i>	<i>1.65</i>	<i>1.87</i>	7.24	<i>7.09</i>	<i>7.13</i>
Electric Utilities	0.46	0.74	0.87	0.62	0.51	<i>0.69</i>	<i>0.87</i>	<i>0.63</i>	<i>0.54</i>	<i>0.69</i>	<i>0.89</i>	<i>0.64</i>	2.79	<i>2.70</i>	<i>2.76</i>
Subtotal	5.75	4.30	3.87	4.88	6.13	<i>4.18</i>	<i>3.53</i>	<i>4.93</i>	<i>6.20</i>	<i>4.45</i>	<i>3.67</i>	<i>5.03</i>	18.80	<i>18.78</i>	<i>19.36</i>

^aExcludes nonhydrocarbon gases removed.

^bNet withdrawals may vary from the difference between opening and closing stocks of gas in working gas storage due to book transfers between base and working gas categories, and other storage operator revisions of working gas inventories.

^cThe balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas disposition.

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); *Natural Gas Monthly*, DOE/EIA-0130(91/07); and *Electric Power Monthly*, DOE/EIA-0226(91/07).

Table 11. Supply and Disposition of Coal: Mid World Oil Price Case
(Million Short Tons)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Supply															
Production	264	254	255	256	254	242	248	258	255	258	253	260	1029	1002	1027
Primary Stock Levels ^a															
Opening	29	35	37	34	33	42	40	37	33	36	33	31	29	33	33
Closing	35	37	34	33	42	40	37	33	36	33	31	31	33	33	31
Net Withdrawals	-6	-2	3	0	-9	2	3	4	-3	3	2	0	-4	0	2
Imports	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3
Exports	22	28	29	26	22	25	27	28	24	29	26	26	106	102	106
Total Net Domestic Supply	236	225	229	231	224	220	225	234	229	233	230	235	922	903	926
Secondary Stock Levels ^b															
Opening	146	160	172	161	167	167	176	160	168	166	180	162	146	167	168
Closing	160	172	161	167	167	176	160	168	166	180	162	166	167	168	166
Net Withdrawals	-14	-12	11	-6	1	-9	16	-8	2	-14	18	-4	-21	-1	2
Total Indicated Consumption	222	213	240	224	224	211	241	226	231	218	248	231	900	902	928
Consumption															
Coke Plants	10	10	10	10	9	8	8	9	9	9	9	9	40	34	37
Electric Utilities	185	182	211	194	189	184	213	195	200	190	220	199	772	781	809
Retail and General Industry ^c	22	19	20	23	22	19	19	22	22	19	19	22	83	82	83
Subtotal	216	212	241	226	219	211	241	226	231	218	248	231	895	897	928
 Total Disposition	222	213	240	224	224	211	241	226	231	218	248	231	900	902	928
 Discrepancy^d	6	2	0	-2	5	0	0	0	0	0	0	0	6	5	0

^aPrimary stocks are held at the mines, preparation plants, and distribution points.

^bSecondary stocks are held by users. Most of the secondary stocks are held by electric utilities.

^cSynfuels plant consumption in 1990 was 1.7 million tons per quarter, and is assumed to remain at that level in 1991 and 1992.

^dHistorical period discrepancy reflects an unaccounted for shipper and receiver reporting difference.

Notes: Rows and columns may not add due to independent rounding. Zeros indicate amounts of less than 500,000 tons. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); and *Quarterly Coal Report*, DOE/EIA-0221(91/1Q).

Table 12. Supply and Disposition of Electricity: Mid World Oil Price Case
(Billion Kilowatthours)

Supply and Disposition	1990				1991				1992				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1990	1991	1992
Net Utility Generation															
Coal	371.5	369.5	426.7	390.7	377.3	<i>371.9</i>	<i>429.5</i>	<i>394.7</i>	<i>405.7</i>	<i>384.9</i>	<i>441.9</i>	<i>402.8</i>	1558.5	<i>1573.3</i>	<i>1635.4</i>
Petroleum	31.1	32.9	31.8	21.3	26.7	<i>23.3</i>	<i>27.8</i>	<i>28.4</i>	<i>32.3</i>	<i>23.1</i>	<i>29.1</i>	<i>29.0</i>	117.2	<i>106.2</i>	<i>113.5</i>
Natural Gas	43.8	70.1	91.8	58.4	48.3	<i>65.7</i>	<i>82.5</i>	<i>59.5</i>	<i>50.9</i>	<i>65.5</i>	<i>84.6</i>	<i>60.1</i>	264.1	<i>256.1</i>	<i>261.0</i>
Nuclear	151.2	127.8	157.9	140.0	151.4	<i>138.6</i>	<i>154.5</i>	<i>138.2</i>	<i>147.9</i>	<i>135.1</i>	<i>156.0</i>	<i>141.9</i>	576.9	<i>582.7</i>	<i>580.9</i>
Hydroelectric	75.6	80.0	61.7	62.5	73.4	<i>80.8</i>	<i>68.1</i>	<i>68.7</i>	<i>79.6</i>	<i>82.4</i>	<i>68.2</i>	<i>69.1</i>	279.8	<i>291.0</i>	<i>299.3</i>
Geothermal and Other ^a	2.7	2.5	2.7	2.7	2.5	<i>2.8</i>	<i>3.1</i>	<i>3.1</i>	<i>3.2</i>	<i>3.2</i>	<i>3.3</i>	<i>3.3</i>	10.7	<i>11.6</i>	<i>12.9</i>
Total Utility Generation	675.9	682.9	772.6	675.6	679.6	<i>683.2</i>	<i>765.5</i>	<i>692.6</i>	<i>719.5</i>	<i>694.1</i>	<i>783.0</i>	<i>706.3</i>	2807.1	<i>2820.9</i>	<i>2902.9</i>
Net Imports	-2.6	-1.7	2.8	3.2	2.2	<i>4.0</i>	<i>6.0</i>	<i>5.9</i>	<i>5.2</i>	<i>6.4</i>	<i>9.0</i>	<i>8.9</i>	1.8	<i>18.1</i>	<i>29.5</i>
Purchase from Nonutilities^b	27.7	28.0	31.7	27.7	31.6	<i>31.9</i>	<i>36.1</i>	<i>31.6</i>	<i>37.1</i>	<i>37.4</i>	<i>42.4</i>	<i>37.1</i>	115.2	<i>131.1</i>	<i>153.9</i>
Total Supply	701.0	709.3	807.1	706.6	713.4	<i>719.1</i>	<i>807.6</i>	<i>730.1</i>	<i>761.8</i>	<i>737.9</i>	<i>834.4</i>	<i>752.2</i>	2924.0	<i>2970.1</i>	<i>3086.3</i>
Losses and Unaccounted For^c	34.3	71.5	61.2	52.4	39.4	<i>63.7</i>	<i>61.8</i>	<i>59.0</i>	<i>46.4</i>	<i>71.0</i>	<i>63.6</i>	<i>60.3</i>	219.3	<i>224.0</i>	<i>241.3</i>
Sales															
Residential	241.2	201.3	264.5	214.0	247.6	<i>219.9</i>	<i>269.1</i>	<i>225.1</i>	<i>267.5</i>	<i>216.5</i>	<i>278.5</i>	<i>233.1</i>	921.1	<i>961.7</i>	<i>995.6</i>
Commercial	177.9	180.3	211.6	182.7	179.9	<i>186.2</i>	<i>213.0</i>	<i>187.2</i>	<i>191.0</i>	<i>191.5</i>	<i>220.3</i>	<i>194.1</i>	752.6	<i>766.3</i>	<i>796.8</i>
Industrial	224.6	233.3	244.7	234.9	223.5	<i>226.8</i>	<i>239.4</i>	<i>235.5</i>	<i>232.8</i>	<i>235.9</i>	<i>247.4</i>	<i>241.0</i>	937.5	<i>925.2</i>	<i>957.1</i>
Other	23.1	22.9	25.1	22.5	22.9	<i>22.5</i>	<i>24.3</i>	<i>23.3</i>	<i>24.1</i>	<i>23.1</i>	<i>24.7</i>	<i>23.6</i>	93.5	<i>92.9</i>	<i>95.5</i>
Total	666.7	637.8	745.9	654.2	673.9	<i>655.3</i>	<i>745.8</i>	<i>671.1</i>	<i>715.4</i>	<i>666.9</i>	<i>770.8</i>	<i>691.9</i>	2704.7	<i>2746.1</i>	<i>2845.1</i>

^aOther includes generation from wind, wood, waste, and solar sources.

^bElectricity received from nonutility sources, including cogenerators and small power producers.

^cBalancing item, mainly transmission and distribution losses.

Notes: Values for purchases from nonutilities and losses and unaccounted for are estimated for 1990. Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*. The forecasts were generated by the following simulations of the demand and supply subsystems of the Short-Term Integrated Forecasting System: D070191BBB17:53 and S071991BBB17:05 for the middle oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(91/07); and *Electric Power Monthly*, DOE/EIA-0226(91/07).

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