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# Short-Term Energy Outlook

## Quarterly Projections

July 1989

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# Preface

The Energy Information Administration (EIA) quarterly forecasts of short-term energy supply, demand, and prices are revised in January, April, July, and October for publication in the *Short-Term Energy Outlook (Outlook)*. An annual supplement analyzes previous forecast errors, compares recent projections by other forecasters, and discusses current topics of 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 projections in this volume extend through the fourth quarter of 1990.

The forecasts are produced using the Short-Term Integrated Forecasting System (STIFS). The STIFS model uses two principal driving variables: a macroeconomic forecast and world oil price assumptions. Macroeconomic forecasts produced by Data Resources, Inc. (DRI), 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 forecast. EIA's Oil Market Simulation Model is used to project world oil prices. (The EIA models are available on computer tape and diskette from the National Technical Information Service.)

The three featured projections for petroleum supply and demand are based on low, middle, and high economic growth assumptions coupled, respectively, with high, middle, and low crude oil price trajectories. The discussion and tables in this volume refer primarily to the middle, or base case, scenario and, unless otherwise noted, to the domestic situation. Other cases examining the sensitivity of total petroleum demand to varying assumptions about prices, weather, and economic activity are shown in Table 7. Discussions of the world oil price refer to the cost of imported crude oil to U.S. refiners.

The forecasts 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 the rounded numbers cited in the text.

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## Highlights

## Highlights

The price of imported crude oil delivered to U.S. refiners increased in early 1989, reaching \$19.60 per barrel in April, the highest price paid by U.S. refiners since January 1986. The base case projections in this *Outlook* call for oil prices to decline to an average of \$17.00 per barrel for the latter half of 1989 and for all of 1990. Motor gasoline prices surged to over \$1.15 per gallon in May, as a number of factors (higher crude oil prices, the imposition of Reid vapor pressure regulations, and normal seasonal increases) affected markets simultaneously. Electricity sales are expected to increase by 2.3 percent this year over last year's record levels (Table 1).

### ***After Initial Gains in 1989, Imported Oil Prices to Decline to \$17.00 per Barrel***

World oil prices increased steadily at the start of 1989, cresting before the June meeting of the Organization of Petroleum Exporting Countries (OPEC). The average price for April was estimated to be \$19.60 per barrel. A slowing in the growth of petroleum demand and limited production restraint by OPEC are expected to result in price levels declining to a level of approximately \$17.00 per barrel through 1990.

### ***Growth in Petroleum Demand Moderates in 1989 and 1990***

Growth in total petroleum product demand is expected to level off to about 0.5 percent per year for 1989 and 1990, although certain individual products (such as jet fuel) are showing slightly stronger growth. Despite a strong start, residual fuel oil demand in 1989 is expected to decline from 1988 levels as utility demand weakens sharply later this year.

### ***Domestic Crude Oil Production Continues to Decline***

Domestic crude oil production is projected to continue to decline in the Lower 48 States. A concurrent decline in Alaskan production is expected in late 1989. In 1989, total U.S. production should decline by 380,000 barrels per day from a year earlier—a 4.7-percent drop. In 1990, total oil production is projected to drop by 190,000 barrels per day, as Lower-48 and Alaskan supplies continue to decline. This assumes that 70,000 barrels per day of new production will come on line from offshore California (Point Arguello), which is now subject to question following the Valdez incident.

### ***Gasoline Prices to Remain at Higher Levels Through Summer Driving Season***

Motor gasoline prices should remain at levels averaging \$1.14 per gallon this summer in response to higher crude prices, Reid vapor pressure regulations, and normal seasonal price increases.

### ***Net Oil Imports to Increase by 590,000 Barrels per Day in 1989***

U.S. net imports of crude oil (including the Strategic Petroleum Reserve) and petroleum products are expected to approach 7.2 million barrels per day in 1989, an increase of 590,000 barrels per day over 1988 levels. This reflects the impact of reduced domestic production, a 0.5-percent increase in demand, and additions to petroleum stocks following a drawdown in 1988.

### ***Electricity Demand Moderates***

Electricity sales are projected to increase by 2.3 percent in 1989 and by 3.0 percent in 1990. Year-over-year growth in the upcoming third quarter is projected to be negative, however. This reflects an assumption of normal summer temperatures, compared to the hot summer experienced in 1988 (weather conditions expected to occur only once in every 50 years). Nevertheless, given an increasing customer base and continued market penetration of new electrical appliances, it is possible that certain regions may experience record peak demand levels during the hottest days of this summer.



**Table 1. Summary of Base Case Assumptions and Projections**

Assumptions and Projections	Year				Annual Percentage Change		
	1987	1988	1989	1990	1987-1988	1988-1989	1989-1990
<b>Macroeconomic Indicators</b>							
Real Gross National Product (billion 1982 dollars) .....	<b>3,847</b>	<b>3,996</b>	<i>4,101</i>	<i>4,164</i>	<b>3.9</b>	<i>2.6</i>	<i>1.5</i>
Index of Industrial Production (Mfg.) (index, 1977 = 1.000) .....	<b>1.346</b>	<b>1.428</b>	<i>1.470</i>	<i>1.481</i>	<b>6.0</b>	<i>3.0</i>	<i>.8</i>
Imported Crude Oil Price (nominal dollars per barrel) .....	<b>18.13</b>	<b>14.64</b>	<i>17.40</i>	<i>17.00</i>	<b>-19.2</b>	<i>18.9</i>	<i>-2.3</i>
<b>Retail Prices (nominal) <sup>a</sup></b>							
Motor Gasoline <sup>b</sup> (dollars per gallon) .....	<b>.96</b>	<b>.96</b>	<i>1.08</i>	<i>1.06</i>	<b>.0</b>	<i>12.5</i>	<i>-1.9</i>
No. 2 Heating Oil (dollars per gallon) .....	<b>.80</b>	<b>.81</b>	<i>.85</i>	<i>.87</i>	<b>1.3</b>	<i>4.9</i>	<i>2.4</i>
Residential Natural Gas (dollars per thousand cubic feet) .....	<b>5.54</b>	<b>5.46</b>	<i>5.63</i>	<i>5.80</i>	<b>-1.4</b>	<i>3.1</i>	<i>3.0</i>
Residential Electricity (cents per kilowatthour) .....	<b>7.41</b>	<b>7.49</b>	<i>7.65</i>	<i>7.94</i>	<b>1.1</b>	<i>2.1</i>	<i>3.8</i>
<b>Petroleum Supply</b>							
Crude Oil Production <sup>c</sup> (million barrels per day) .....	<b>8.35</b>	<b>8.14</b>	<i>7.76</i>	<i>7.57</i>	<b>-2.5</b>	<i>-4.7</i>	<i>-2.4</i>
Net Petroleum Imports, Including SPR (million barrels per day) .....	<b>5.91</b>	<b>6.59</b>	<i>7.18</i>	<i>7.48</i>	<b>11.5</b>	<i>9.0</i>	<i>4.2</i>
<b>Energy Demands</b>							
Total Market Economies Petroleum (million barrels per day) .....	<b>49.20</b>	<b>50.86</b>	<i>51.91</i>	<i>52.79</i>	<b>3.4</b>	<i>2.1</i>	<i>1.7</i>
Total U.S. Petroleum Consumption (million barrels per day) .....	<b>16.67</b>	<b>17.28</b>	<i>17.36</i>	<i>17.45</i>	<b>3.7</b>	<i>.5</i>	<i>.5</i>
Motor Gasoline .....	<b>7.21</b>	<b>7.34</b>	<i>7.41</i>	<i>7.47</i>	<b>1.8</b>	<i>1.0</i>	<i>.8</i>
Jet Fuel .....	<b>1.38</b>	<b>1.45</b>	<i>1.48</i>	<i>1.52</i>	<b>5.1</b>	<i>2.1</i>	<i>2.7</i>
Distillate Fuel Oil .....	<b>2.98</b>	<b>3.12</b>	<i>3.11</i>	<i>3.20</i>	<b>4.7</b>	<i>-.3</i>	<i>2.9</i>
Residual Fuel Oil .....	<b>1.26</b>	<b>1.38</b>	<i>1.32</i>	<i>1.17</i>	<b>9.5</b>	<i>-4.3</i>	<i>-11.4</i>
Other Petroleum <sup>d</sup> .....	<b>3.83</b>	<b>4.00</b>	<i>4.05</i>	<i>4.10</i>	<b>4.4</b>	<i>1.3</i>	<i>1.2</i>
Natural Gas Consumption (trillion cubic feet) .....	<b>17.14</b>	<b>17.89</b>	<i>18.13</i>	<i>18.54</i>	<b>4.4</b>	<i>1.3</i>	<i>2.3</i>
Coal Consumption (million short tons) .....	<b>837</b>	<b>883</b>	<i>889</i>	<i>905</i>	<b>5.5</b>	<i>.7</i>	<i>1.8</i>
Electricity Sales (billion kilowatthours) .....	<b>2,455.4</b>	<b>2,566.2</b>	<i>2,624.6</i>	<i>2,702.9</i>	<b>4.5</b>	<i>2.3</i>	<i>3.0</i>
Gross Energy Consumption <sup>e</sup> (quadrillion Btu) .....	<b>76.77</b>	<b>80.09</b>	<i>80.93</i>	<i>82.46</i>	<b>4.3</b>	<i>1.0</i>	<i>1.9</i>
Thousand Btu/1982 Dollar of GNP .....	<b>19.96</b>	<b>20.04</b>	<i>19.73</i>	<i>19.80</i>	<b>.4</b>	<i>-1.5</i>	<i>.4</i>

<sup>a</sup> All prices include taxes, except prices for No. 2 heating oil and residential electricity.

<sup>b</sup> Average for all grades and services.

<sup>c</sup> Includes lease condensate.

<sup>d</sup> Includes crude oil product supplied, natural gas liquids, liquefied refinery gases, other liquids, and all finished petroleum products except motor gasoline, jet fuel, and distillate and residual fuel oils.

<sup>e</sup> The conversion from physical units to Btu is calculated by STIFS 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*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); *International Energy Annual 1987* DOE/EIA-0219(87); *Petroleum Marketing Monthly*, DOE/EIA-0380(89/04); *Petroleum Supply Monthly*, DOE/EIA-0109(89/04); *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Natural Gas Monthly*, DOE/EIA-0130(89/04); *Electric Power Monthly*, DOE/EIA-0226(89/04); and *Quarterly Coal Report*, DOE/EIA-0121(89/1Q); Organization for Economic Cooperation and Development, *Monthly Oil Statistics Database* through December 1988. Macroeconomic projections are based on modifications to Data Resources, Inc., Forecast CONTROL0689.

## **Assumptions**

- **International Petroleum**
- **World Oil Prices**
- **Energy Product Prices**
- **Macroeconomic Activity**

# International Petroleum

## *Recent Developments*

The world oil market in late June of this year appeared to have recovered from the effects of the disruptions to U.S. and United Kingdom oil production that occurred in March and April. On June 23, spot prices for OPEC crude oils ranged from about \$14 to \$17 per barrel, returning to the range of prices experienced in February. The June rate was down sharply from this year's peak range of \$17 to \$21 per barrel attained in late April.<sup>1</sup> The price of imported crude oil delivered to U.S. refiners also appears to have peaked in April at about \$19.60 per barrel, the highest price paid by U.S. refiners since January 1986.<sup>2</sup>

Recent revisions to historical oil consumption data, incorporated in this *Outlook*, have provided more evidence to support the view that the world oil market was relatively balanced at the end of 1988 and to explain why oil prices turned up sharply in the first quarter of 1989. EIA currently estimates that the demand for petroleum products by the Market Economies averaged more than 50.8 million barrels per day in 1988, an increase of 1.7 million barrels per day, or 3.4 percent, from the revised rate for 1987 (Table 1). The revised rate for 1987 is 150,000 barrels per day higher than the previous estimate, with Europe accounting for 90,000 barrels per day of this increase and Japan accounting for 30,000 barrels per day. The revised rate for 1988 is 460,000 barrels per day higher than the previous estimate. The United States and Europe each account for about 100,000 barrels per day of this increase, while the Other Market Economies account for 210,000 barrels per day.

It is now estimated that the demand for petroleum products by the Market Economies in the fourth quarter of 1988 was almost 53.1 million barrels per day, or 380,000 barrels per day higher than the previous estimate. This rate, which was only 550,000 barrels per day less than estimated total oil supply, absorbed much of the over 24.2 million barrels per day of oil that OPEC produced in the fourth quarter (including about 1.8 million barrels per day of condensate and liquefied petroleum gas production and refinery gain) (Table 2). This robust demand picture set the stage for the market to tighten considerably in the first quarter of 1989, when total supply declined by over 2.7 million barrels per day, including a decline of 2.2 million barrels per day in OPEC production. Consumption was declining at the same time, but by only 580,000 barrels per day.

The loss of almost 500,000 barrels per day of production from the Brent field in April initially pushed oil prices even higher, but they began to decline in early May when it became apparent that OPEC member nations were increasing production by about 910,000 barrels per day over the first-quarter rate, both to replace the lost North Sea crude oil and (especially in the case of Kuwait) to strengthen their bargaining positions at the OPEC Ministerial Conference in June. At that meeting, the OPEC Oil Ministers agreed to increase the OPEC crude oil production ceiling for the second half of the year by 1.0 million barrels per day, to 19.5 million barrels per day. Demands by Kuwait and the United Arab Emirates (UAE) for larger shares of the new ceiling were rejected by a Saudi-led majority, and, as a result, Kuwait rejected its assigned quota. The quota issue will be reconsidered in late September, when the Oil Ministers meet to consider a further increase in the OPEC production ceiling.

The world oil market stands at a critical juncture as the second half of 1989 begins. The direction that world oil prices will take in the last 6 months of 1989, and in 1990, appears to be critically related to the production decisions of four OPEC member states from the Persian Gulf region—namely, Kuwait, the UAE, Saudi Arabia, and Iraq. If OPEC can successfully address the conflicting desires of these four member states so that they produce at rates near to their production quotas, then world oil prices could stabilize near current levels. If, on the other hand, the demands of Kuwait and the UAE for significantly higher production quotas are not satisfied at the OPEC meeting in late September, and they react by increasing production, then prices will probably decrease in the fourth quarter. This decrease could even occur in the third quarter if Kuwait continues to produce at a rate of 1.8 to 2.0 million barrels per day, rather than at the rate of 1.35 million barrels per day that was promised at the June OPEC Ministerial Conference. A complete price collapse in the second half of 1989 can probably be prevented as long as Saudi Arabia does not decide to retaliate against Kuwait and the UAE by sharply increasing its own production.

The situation will become more precarious for OPEC in 1990, because Iraq is expected to reenter the picture as a potential overproducer. In 1989, Iraq's constrained export capacity should prevent the country from producing significantly more than its production quota. This constraint will be removed during 1990, however, as the Iraqi pipeline through Saudi Arabia is completed and as Iraq restores its export facilities in the Persian Gulf. As a result, Iraq will have the potential to place a minimum of an additional 0.5 million barrels per day of crude oil production on the market in 1990. This, in turn, will make the task of OPEC in addressing the conflicting desires of its members even more difficult in 1990, especially if lower economic growth sharply reduces the rate of growth of oil consumption.

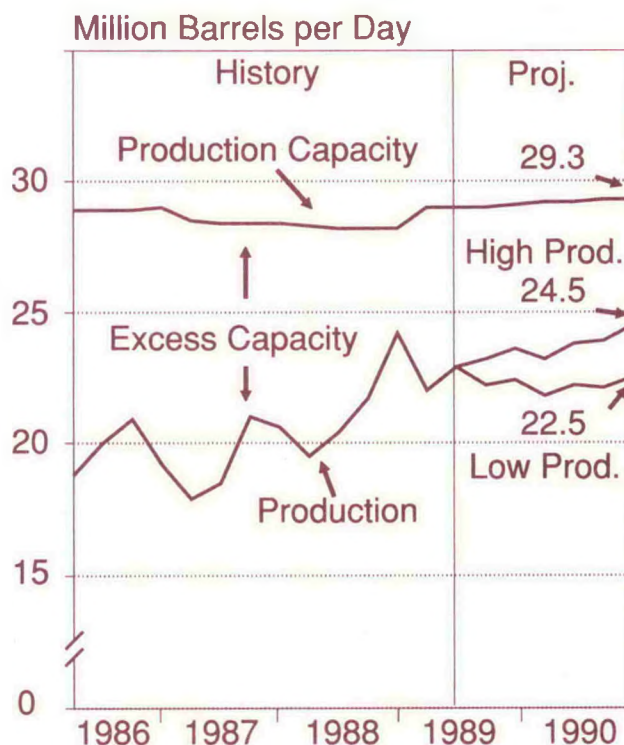
### Forecast

The demand for petroleum products by the Market Economies is expected to average 51.9 million barrels per day in 1989, an increase of 1.05 million barrels per day, or 2.1 percent, from the 1988 rate (Table 2). In 1990, demand is expected to increase by 880,000 barrels per day, or 1.7 percent.

Petroleum demand by the OECD countries is expected to average almost 37.5 million barrels per day in 1989, an increase of 530,000 barrels per day, or 1.4 percent, from the rate for 1988. This increase is based on the assumption that the OECD economies will grow at a 3.1-percent rate in 1989 (Table 3). Japan is expected to account for about 40 percent of the demand increase, while Europe should account for about 30 percent. In 1990, as a result of a slowing in OECD economic growth to only 2.2 percent, OECD petroleum demand is expected to increase by only 350,000 barrels per day, or 0.9 percent. In the Other Market Economies, petroleum demand is expected to increase by about 520,000 barrels per day, or 3.7 percent, in both 1989 and 1990.

Oil production from the non-OPEC market economies may decline by about 230,000 barrels per day in 1989, and then increase by about 500,000 barrels per day in 1990. In 1989, significant production declines from the United Kingdom (360,000 barrels per day) and the United States (370,000 barrels per day) will more than offset increases from Norway (360,000 barrels per day) and Syria (50,000 barrels per day). In 1990, expected production increases from the United Kingdom (250,000 barrels per day) and Norway (100,000 barrels per day) will more than offset a decline from the United States (180,000 barrels per day), while production from Colombia may increase by as much as 120,000 barrels per day if guerrilla attacks can be ended.

The forecast detailed above implies OPEC oil production in 1989 of almost 22.7 million barrels per day, or 1.2 million barrels per day above the rate for 1988 (Figure 1). In 1990, OPEC production will probably continue to increase, especially once significant additions to Iraq's export capacity become operational. A range of possible aggregate OPEC oil production levels is projected, based on a range



**Figure 1. OPEC Oil Production and Production Capacity**

Note: OPEC production includes crude oil, natural gas liquids, and refinery gain.

Sources: **History:** Energy Information Administration, Office of Energy Markets and End Use, International and Contingency Information Division. **Projections:** Table 2.

of assumed inventory behavior, but these projections are not disaggregated to the country level (Figure 1). Significant excess oil production capacity is expected to persist in the OPEC member nations throughout the forecast period.

## World Oil Prices

One of the most uncertain factors affecting the domestic short-term energy outlook is the world oil price, defined here as the nominal price of imported crude oil delivered to U.S. refiners. Because of this uncertainty, three different world oil price scenarios are employed (Figure 2). These scenarios are used to develop a base case projection and two alternative projections for domestic supply and demand (Table 4).

In the base oil price scenario, the world oil price decreases from \$18.80 per barrel in the second quarter of 1989 to \$17.00 in the second half of 1989 and throughout 1990. This scenario is based on the assumption that OPEC will be able to agree this fall on a new set of crude oil production quotas that will generally restrain total OPEC oil production to a narrow range around 23.0 million barrels per day.

In the low oil price scenario, the world oil price decreases to \$15 per barrel in the third quarter of 1989 and remains at that level throughout the forecast period. In this scenario, it is assumed that a continuing battle for market share between the Persian Gulf members of OPEC will lead to increased OPEC oil production and lower oil prices. Revenue concerns, however, hold overproduction below levels that would trigger a price collapse.

In the high oil price scenario, the world oil price increases to \$20.00 per barrel in the third quarter of 1989 and remains at that level throughout the forecast period. In this scenario, it is assumed that economic growth and oil consumption growth will remain strong throughout 1989 and 1990, and that OPEC will reach a solid production accord that will reduce the incentive for Persian Gulf member nations to engage in excessive overproduction.



**Figure 2. World 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*, DOE/EIA-0035(89/04) (Washington, DC, 1989). **Projections:** Table 4.



## Energy Product Prices

No major developments in energy product prices between 1989 and 1990 are expected, largely reflecting the outlook for constant crude oil prices. As of this writing, energy prices are not expected to be affected by the wildcat coal strike in the Appalachian region nor by the recent oil spills in the Lower 48 States during the forecast period.

### **Gasoline Prices to Peak at \$1.14 per Gallon this Summer, but Ease Next Year**

Between March and April of this year, the price of gasoline jumped by \$0.12 per gallon, which was the largest single month-to-month price increase for this fuel on record in the United States (Figure 3). The underlying fundamental force that brought on the increase in gasoline prices was an earlier increase in crude oil prices, which had risen from \$12.58 per barrel in November 1988 to \$19.22 in April 1989 (composite refiner acquisition cost), the equivalent of a \$0.16-per-gallon increase.

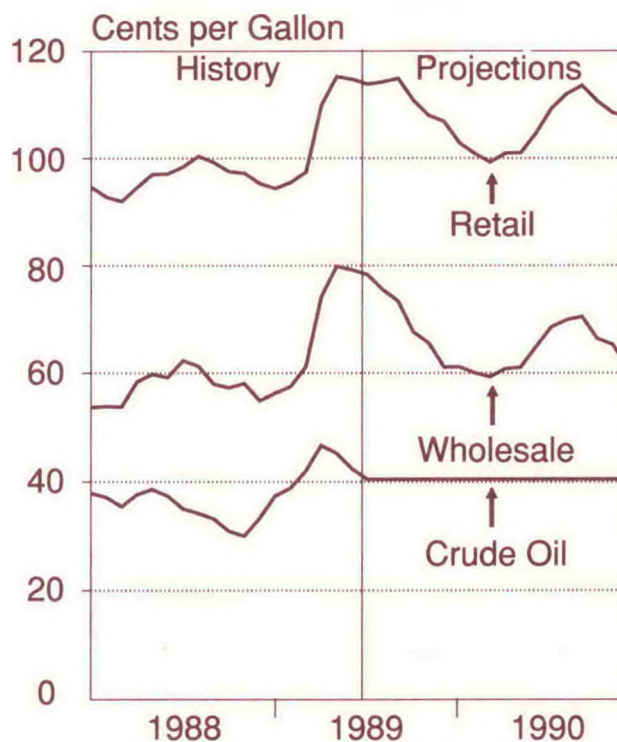
Many other factors contributed directly or indirectly to the timing of the increase in gasoline prices and to the speed with which it took place. Included among those factors were high refinery utilization rates due to strong demand, added costs to refiners to reduce vapor emissions (as mandated by the Environmental Protection Agency), the changeover in inventories within the distribution chain to replace existing gasoline stocks with low-vapor-pressure stocks, and, especially in the short-lived spot market, perceptions that shortages might develop following the Valdez incident. These perceptions turned out to be mistaken, and within two and a half weeks the spot market returned to levels compatible with concurrent crude oil prices.

In May, prices increased by another \$0.05 per gallon over April prices. In June, prices began to ease slightly, reflecting lower crude oil prices and a return to stability in the market.

On a quarterly basis, gasoline prices are expected to peak in the third quarter of 1989 at \$1.14 per gallon—close to the second quarter price. A factor that could keep prices high this summer is an anticipated decrease in the easy availability of low-lead gasoline from Europe (particularly in the United Kingdom). Rising demand for low-lead gasoline in Europe, combined with growing U.S. demand, should raise the import price of these overseas supplies to U.S. markets. Furthermore, about 12 States have raised taxes on gasoline this year. By 1990, less pressure on supply, slightly lower crude oil prices, and the general effects of competition should act to ease gasoline prices.

### **Electricity Prices Still Steady**

Since 1986, residential electricity rates have been falling in real terms due to both declining fuel and capital costs. Electricity price increases will continue to lag inflation, as increases in fossil fuel costs



**Figure 3. Motor Gasoline Prices**

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989). **Projections:** Table 5.

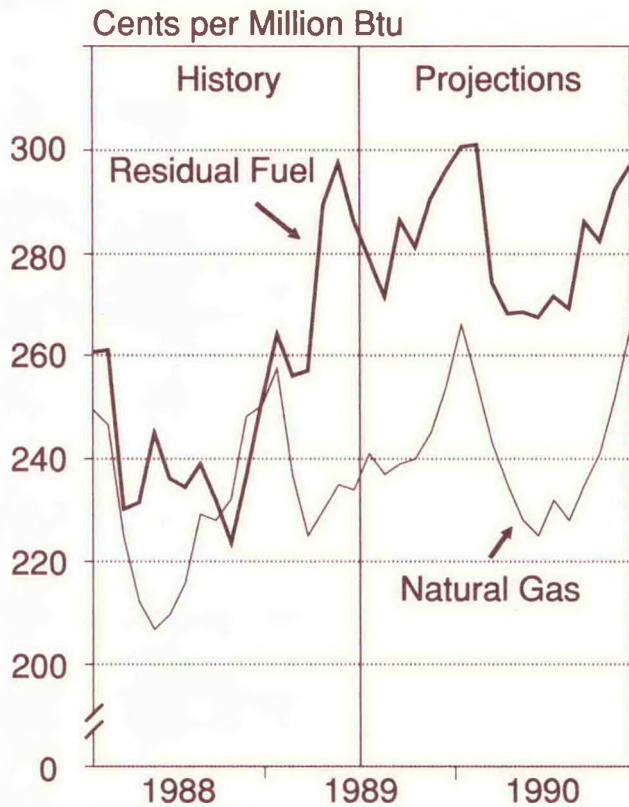
and capital costs remain moderate. In addition, sharp increases in hydroelectric output in North America this year and next year should act to relieve pressure on electricity production costs in some regions. High demand in some regions of the country (especially the East Coast) could occur, since growth in generating capacity has not kept pace with increases in demand. If the summer is especially hot, utilities in some of these regions will not be able to meet demand without having to purchase more electricity outside their areas, thus passing on the increased cost to their consumers. Power cutbacks (voltage reductions) and significant purchases of supplemental power from the Mid-Atlantic region have already occurred this year (see "Electric Utility Fuel Consumption").

### ***Fossil Fuel Prices to Utilities Remain Soft, Despite Coal Strike***

Coal prices to electric utilities have drifted downward over the last several years, due to competition from other fossil fuels, increased productivity, a shift away from the more costly underground mines east of the Mississippi to the less expensive surface mines in the West, and because of excess mining capacity. In the forecast period, coal prices are expected to remain soft, rising slightly, but at a rate less than inflation. Although the coal strike in Virginia has been joined by wildcat strikes in other States, there has been no upward adjustment to the national-level coal prices contained in this *Outlook*. At the end of the first quarter of this year, electric utilities had sufficient coal supplies to allow them to manage a fairly short or selective disruption. In the event of a prolonged and wide-ranging strike, prices to utilities could rise, particularly in the East.

Residual fuel oil prices for the first quarter of this year were unseasonably low, even in the wake of rising crude oil prices (Figure 4). An easing of supplies due to mild winter temperatures was the primary reason, reversing the situation of tight supplies and relatively high prices of the previous quarter. In the forecast period, prices should follow the price of crude oil. An exceptionally hot summer could result in higher prices for residual fuel oil in some regions.

Natural gas prices to electric utilities, on a national average, have remained relatively weak compared to residual fuel prices since the beginning of the year. For a brief period last October, residual fuel oil, historically the more expensive of the two fuels, became the less expensive. This was due partly to heavy industrial demand for natural gas, but more importantly was due to sharply reduced crude oil prices (Figure 4). Both residual fuel oil and gas prices are expected to increase over the forecast period, given normal weather patterns. The price advantage of natural gas is expected to continue. In some regions, residual fuel oil may be the cheaper of the two fuels, depending on supply conditions for both gas and oil. Aside from possible regional differences, residual fuel oil use at utilities should be far less prevalent later this year and next year.



**Figure 4. Utility Fossil Fuel Prices**

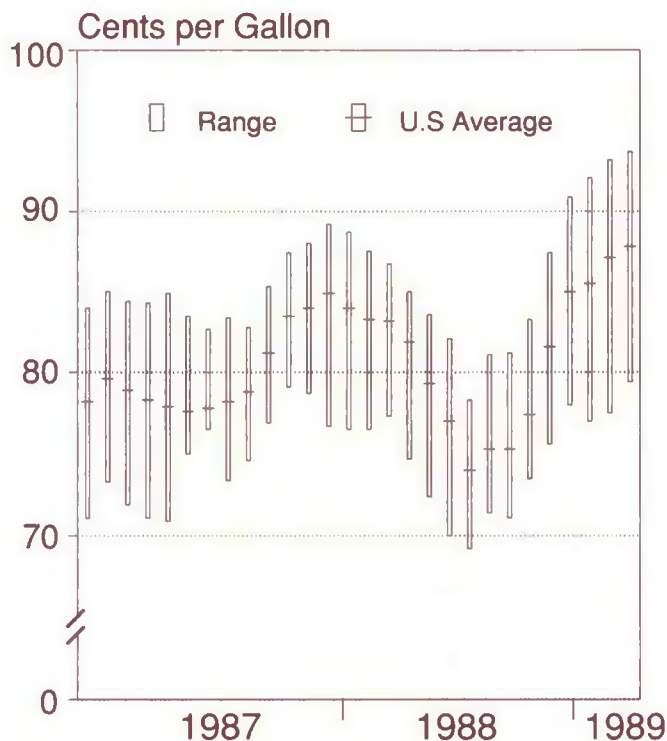
Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989). **Projections:** Table 5.



## Gas Wellhead Decontrol Bill Passed

On July 12, 1989, Congress approved legislation to remove all remaining natural gas wellhead price controls by 1993. To allow ample time for contracts to be renegotiated, Congress adopted a phase-in schedule for decontrol. In general, price controls will be eliminated when current contracts between producers and buyers expire, or on January 1, 1993, whichever is earlier. Specifically, the bill decontrols immediately all gas covered by expired, terminated, or new contracts signed after enactment of the bill. Gas produced from any wells drilled after enactment of the bill will be decontrolled on May 15, 1991. On January 1, 1993, all price controls on the first sale of natural gas will be removed.<sup>3</sup>

The impact of this legislation on gas prices in the short term is expected to be negligible. Current market prices are significantly below ceiling prices for many categories of natural gas. Less than 1 trillion cubic feet, or about 6 percent of the Nation's total production, is held below market prices by ceilings. Over the longer term, price decontrol of all first sales of natural gas will inject low-cost gas into the system that would not be available under price controls and, as a result, will provide lower prices than would otherwise occur. The direction of movement for the average market price in the short term, however, will ultimately depend on how much new supply is stimulated by decontrol and how quickly both below-market and above-market contracts are renegotiated. For 1989 and 1990, wellhead prices may increase, even though crude oil prices are expected to weaken, because supplies are tightening.



**Figure 5. Heating Oil Prices**

Note: Range refers to the amount of regional price variance across the United States.

Source: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989).

## No Large Increase in Heating Oil Prices Foreseen

Residential heating oil prices increased by nearly \$0.14 per gallon from the third quarter of 1988 to the second quarter of 1989. Nearly all of this increase can be explained by the increase in crude oil prices that occurred during the period. Heating oil prices were, in fact, higher in the second quarter of this year than in the first quarter, when the price normally peaks with the winter heating season. Again, this can be attributed to the high crude oil price in the spring, and mild temperatures. Heating oil prices are expected to vary little from 1989 to 1990, reflecting the underlying steady outlook for crude oil prices (Table 5). Heating oil prices will continue to vary considerably across regions, however, depending on proximity to refineries, the level of competition, and weather patterns (Figure 5).

For the forecast period, normal weather is assumed for the United States as a whole and for all regions. Thus, an "average" or "normal" regional variance is expected for heating oil prices next winter, which corresponds to a differential of \$0.12 to \$0.13 (the average for 1988 to 1989) between the regions with the highest prices and those with the lowest prices.

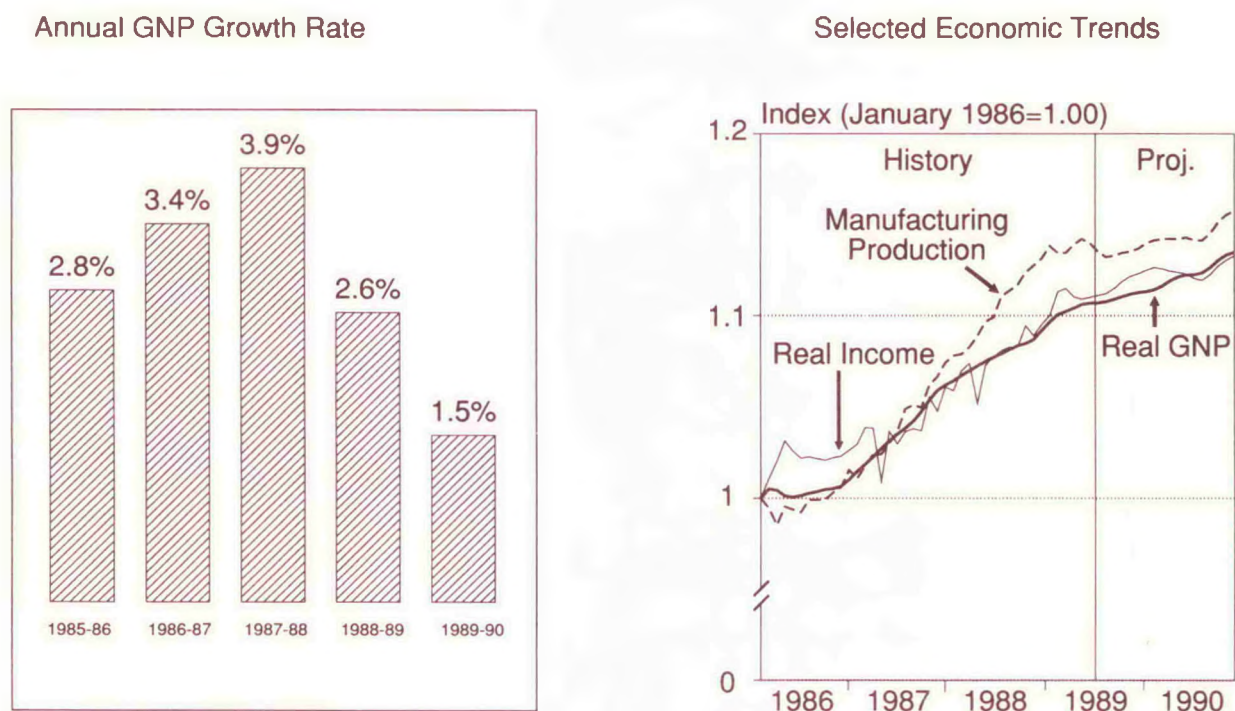


## Macroeconomic Activity

Signs of a slowing economy are becoming evident as the year unfolds. In May, the index of leading economic indicators fell by 1.2 percent, the largest decline in 18 months.<sup>4</sup> Orders for durable equipment were sluggish during the same period, declining by 4.2 percent from April.<sup>5</sup> No recession is expected for this forecast period, however. A markedly slower advance for the U.S. gross national product (GNP) is expected in 1989, compared to the robust growth in 1988 (3.9 percent): 2.6 percent growth is expected this year and 1.5 percent growth is foreseen for 1990 (Table 4 and Figure 6). This forecast is derived principally from the Data Resources, Incorporated, (DRI) June macroeconomic forecast of the U.S. economy, modified to reflect both EIA energy price assumptions and somewhat higher levels of consumer confidence through 1990 than are assumed in the DRI base case. The adjustment in the consumer confidence index, which was made following a review of other current macroeconomic forecasts, leads to slightly higher energy demand forecasts than would otherwise be the case.

Growth in industrial production in the manufacturing sector is assumed to fall sharply this year and next, approaching 0.8 percent by 1990, compared to 6.0 percent in 1988. In the nonutility industrial sector, this slowdown is expected to curb energy demand growth, particularly for natural gas.

The economic slowdown will affect growth in personal income, particularly in 1990. This year, real disposable personal income is expected to continue to grow at a respectable 3.4-percent rate. This growth in income may not translate fully into spending growth, however, as consumers are likely to increase their savings rate somewhat from the generally low levels seen recently.



**Figure 6. Key Economic Indicators**

Sources: **History:** Bureau of Economic Analysis, U.S. Department of Commerce, *Survey of Current Business*, June 1989; Federal Reserve System, *Statistical Release G.12.3*, June 1989. **Projections:** Table 4.

## **U.S. Petroleum Outlook**

- **Petroleum Demand**
- **Petroleum Supply**
- **Motor Gasoline**
- **Distillate Fuel Oil**
- **Residual Fuel Oil and  
Other Petroleum Products**
- **Jet Fuel**

## Petroleum Demand

### Overview

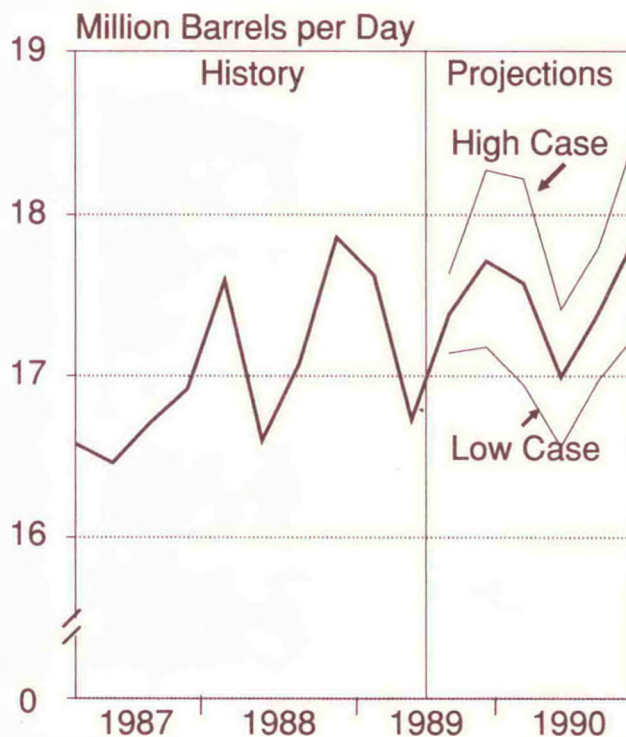
Petroleum demand is expected to average 80,000 barrels per day higher this year than last year (Table 6 and Figure 7). This gain is equivalent to only one-eighth of the increase estimated for 1988, because it reflects the assumption of a slowing domestic economy, milder temperatures (either already experienced or assumed for the remainder of 1989), and price increases relative to 1988. This year's increase consists mostly of growth in transportation fuel demand and continued but decelerating growth in chemical feedstock demand. These areas of demand strength are offset by projections of reduced heating fuel demand, which will almost certainly materialize if temperatures are normal or above normal this fall. Electric utility fuel oil use, while unusually strong through the second quarter of this year, should taper off with higher prices, so long as natural gas supplies and nuclear power sources meet expected levels of availability, and so long as hydroelectric power resources continue to improve from the drought conditions of last year.

Only an additional 90,000 barrels per day of petroleum demand is expected in 1990, mainly because electric utility consumption and other industrial uses of residual fuel oil are expected to exhibit weakness throughout next year. Petroleum demand in the remaining product groups combined (thus, excluding residual fuel oil) increases by 240,000 barrels per day in 1990 (assuming normal weather). This increase is based on an expected rebound in heating fuel demand next winter and slower gains in transportation fuel demand. Nonutility industrial use of oil (including chemical feedstock use) is projected to increase modestly in 1990, as growth in industrial output slows to 0.8 percent.

### Gasoline and Residual Fuel Oil

Although continued strength in motor gasoline and flattening out or weakening in residual fuel oil demand in 1989 are key features of the current forecast, demand in the first half of 1989 shows the opposite pattern. Both fuels are currently being influenced by unique factors, which are tending to distort or tilt usual seasonal patterns.

Motor gasoline markets entered a volatile period when sharp increases in gasoline prices occurred in late March and early April. Uncertainty as to the likelihood that these changes would be permanent probably led gasoline buyers to postpone purchases during the second quarter until the price picture was clarified. Perhaps more importantly, secondary and tertiary suppliers of motor gasoline, required by the Environmental Protection Agency and some States to reduce Reid vapor pressure (RVP) of finished gasoline supply, were forced in middle to late spring to change over remaining inventories of high-RVP gasoline from storage facilities. This was done to make room for the required low-RVP product and ensure non-adulteration of the low-RVP stream and probably resulted in some low stock



**Figure 7. Total Petroleum Demand**

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989). **Projections:** Tables 6, 8, and 9.

reports. As a result, there was hesitancy to accept distribution of gasoline from primary supply. The initial price surge may also have caused some reductions in discretionary automobile use. It is believed that shipments of motor gasoline will be relatively high in the second half of 1989, reflecting a catch-up by downstream suppliers of gasoline to meet summer demand.

Residual fuel oil demand has been strong so far this year, up 5.1 percent for the first half of 1989 compared to 1988. The year-over-year gain is attributable to increased shipments to electric utilities, as nonutility use continues to show little or no growth. While utilities had been taking advantage of cheap oil in late 1988 and reducing natural gas use, it was expected that higher oil prices relative to gas prices would have ended the increased demand for residual fuel oil at utilities by March or April of this year. Generation from gas and nuclear fell below expectations during the first half of this year, however, inducing continued buying of oil for generation and for stockpiling by utilities. It is expected that nuclear power availability will improve markedly in the second half of this year, gas will remain competitively priced, and the current gains in hydroelectric power availability will accelerate. These factors should reduce residual fuel oil requirements from the second quarter of this year through the remainder of the forecast period compared to what occurred over the last 12 months.

### ***Petroleum Sensitivities***

Table 7 provides a summary of the estimated sensitivity of domestic petroleum demand to variations in the world oil price, alternative macroeconomic growth assumptions and weather conditions. The table also provides an explicit decomposition of the differences between the current alternative petroleum demand cases and the base case into price, macroeconomic, and weather sources. For the current *Outlook*, about 11 percent of the overall difference in petroleum demand cases is explained by oil price variation, 55 percent is due to different assumptions about economic growth, and the remainder is due to weather variance. For the purpose of constructing sensitivity cases, the three sources of uncertainty are assumed to be strictly additive.

The total range of projected petroleum demand includes variance due to economic growth departing significantly from the base case, such that real GNP growth rates exceed or fall short of base case growth by 1 percentage point for the high and low growth cases, respectively. Analysis of macroeconomic forecasts over the last year shows that this range provides at least a two-thirds probability of capturing the actual short-run (1 to 2 years) growth in the economy. In addition, the weather component used in the sensitivity cases is comprised of the greatest quarterly variance in weather observed over the past 15 years.

Combining the information from Table 4 with that in Tables 7, 8, and 9, the sensitivities of domestic petroleum demand to changes in the three determinants discussed above can be summarized as follows:

- For every \$1.00 increase in world oil price, petroleum demand can be expected to fall by approximately 25,000 barrels per day;
- For every 1 percentage point of additional growth in real GNP, petroleum demand can be expected to increase by about 130,000 barrels per day;
- For every 1 percent increase of cooling degree-days over normal levels, petroleum demand is expected to increase by 0.02 percent; for heating degree-days, petroleum demand is expected to increase by 0.11 percent.

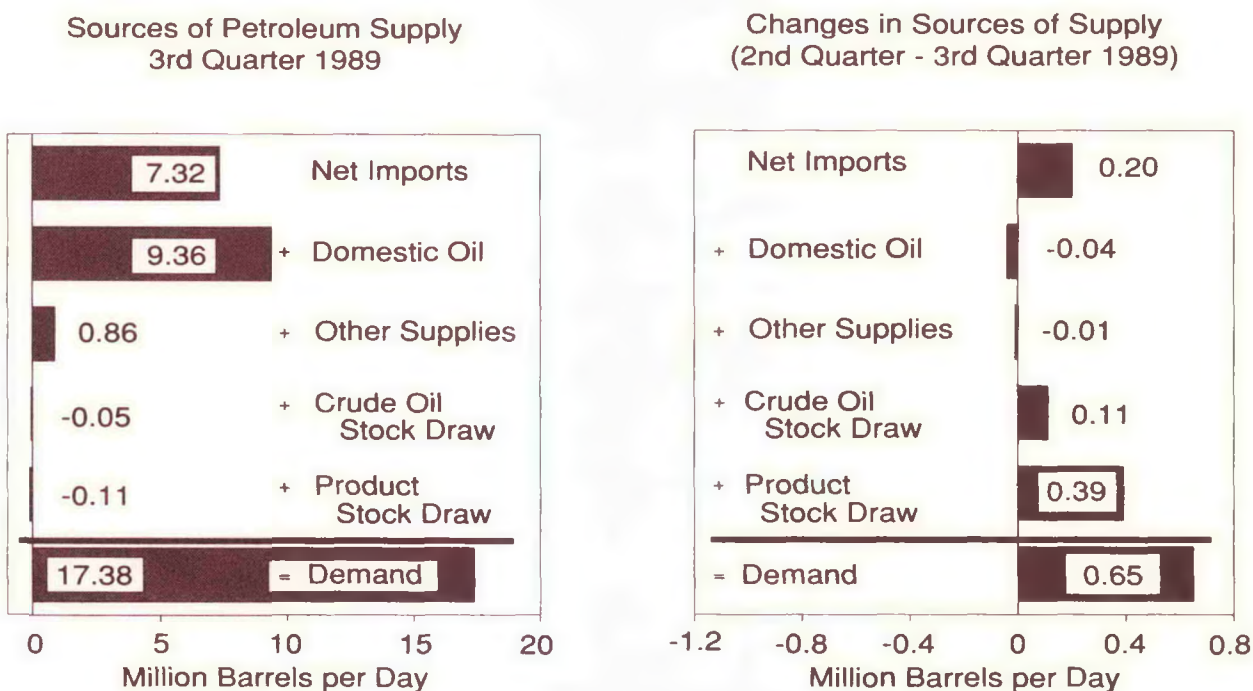


## Petroleum Supply

Increased petroleum demand this summer will be met almost entirely from increased imports. Net petroleum imports are expected to rise from 38.8 percent of domestic consumption last summer to 42.1 percent in the third quarter of this year (Figure 8 and Table 6). The recent high growth in imports slows in 1990, however, as the anticipated decline in domestic oil production moderates under the prices assumed here and as the petroleum demand growth slows with the U.S. economy.

Crude oil and refined product stocks are expected to show only normal seasonal variability throughout 1989 and 1990, reflecting the outlook for level world oil prices. Crude oil stock levels, excluding Strategic Petroleum Reserves (SPR) holdings, are forecast to be at 335 million barrels by the end of summer 1989—1 million barrels below the June 1989 level and 6 million barrels above the year-earlier level. SPR inventories are expected to increase by an average of 25 million barrels per year in 1989 and 1990.

High domestic refinery production and seasonal increases in gasoline imports will be necessary to meet projected demand during the 1989 driving season. Gasoline imports (gross) will average 430,000 barrels per day over the summer months, slightly below last summer's level, and domestic refinery production of gasoline will increase by 190,000 barrels per day to meet the summer demand (Table 10). Refineries do not appear to be having serious problems in coping with the Environmental Protection Agency's more stringent summer gasoline specifications, although some localized distribution problems associated with supplies of lower-vapor-pressure gasoline have been reported. Domestic refinery utilization rates must remain high throughout the forecast period to meet projected demand.



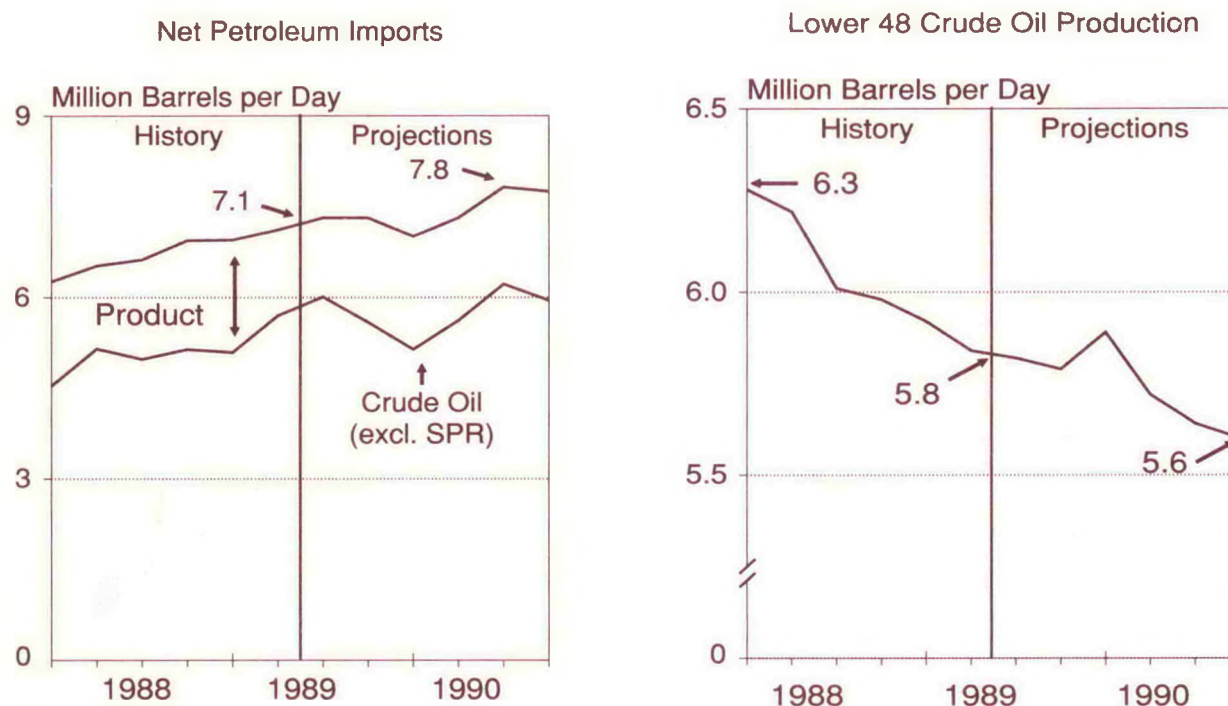
**Figure 8. Sources of Petroleum Supply**

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to April 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24, 28) (Washington, DC). **Projections:** Table 6.

Domestic oil production is expected to drop by 380,000 barrels per day in 1989, or 4.7 percent below the 1988 rate. A smaller production decline of 190,000 barrels per day, or 2.4 percent, is anticipated in 1990. Nearly 80 percent of the decline between 1989 and 1990 is from the producing regions of the Lower 48 States. Alaskan production should begin to drop off in late 1989 with the start of the long-expected decline in the giant Prudhoe Bay field.

When oil prices fell back to 1986 levels in the latter half of 1988, drilling and production in the Lower 48 States were seriously affected (Figure 9). Because crude oil prices are projected to be relatively stable from the middle of 1989 through 1990, greater industry confidence is expected, and this should lead to increased drilling in 1990. The long-planned start of production from the new Point Arguello field in the Pacific Federal offshore area is expected to contribute over 70,000 barrels per day (nearly 1 percent of total U.S. production), which will also help slow the rate of decline in production. However, whether this new supply source comes on line or not is subject to question following the Valdez incident.

According to the Baker Hughes rotary rig count, rotary rig activity in 1989 fell from 841 in January to 795 in June, despite increasing oil prices during this period.<sup>6</sup> The extremely large price drops of 1986 and low prices reached in late 1988 have generated uncertainty about future oil prices. Apparently, this uncertainty has led to a lower drilling response to a given price than has historically been the case. Therefore, drilling activity in 1989 is expected to be lower than in 1988. Drilling activity in 1990 is expected to be slightly higher than in 1989, mainly because crude oil prices are expected to remain fairly stable for the second half of 1989 through 1990.<sup>7</sup>



**Figure 9. Petroleum Imports and Production**

Note: Crude oil production includes lease condensate.

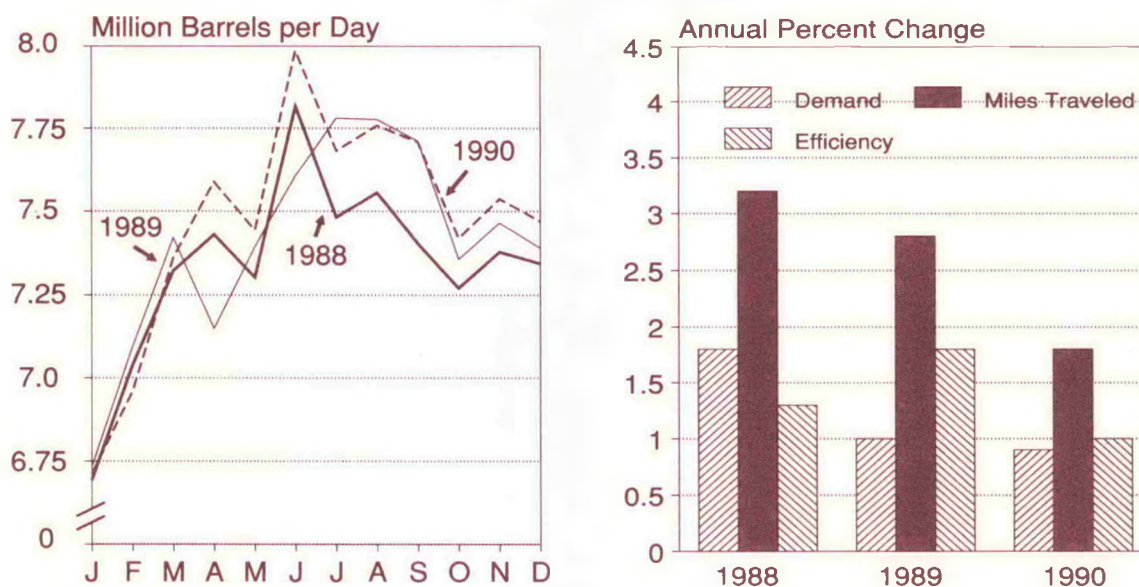
Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88/1); *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to April 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24, 28) (Washington, DC). **Projections:** Table 6.



## Motor Gasoline

Despite recent indications that motor gasoline demand slowed through the first half of this year, a rebound from the comparatively low recent figures is expected in the second half of this year. On balance, this year should bring growth in gasoline demand of about 1.0 percent, and a similar amount in 1990 (Table 6). The 1990 growth in demand is anticipated despite a sharply attenuated economic outlook, because real fuel prices are expected to decline noticeably from the relatively high levels of 1989.

Through June of this year, motor gasoline product supplied remained virtually constant in comparison with year-earlier levels, according to recent estimates.<sup>8</sup> This lack of demand growth (with noticeable declines in some months, particularly April) was somewhat surprising in view of the apparent continued growth in vehicle travel over that period.<sup>9</sup> It is assumed that the sharply higher gasoline prices in April actually reduced discretionary driving somewhat, but, more importantly, that demand for gasoline from primary supply was reduced because of price-hedging and because of delays in deliveries encouraged by the ruling on low Reid vapor pressure (RVP) issued by the Environmental Protection Agency. It is expected that many secondary suppliers, taken by surprise by the sharp price increases in April, may have assumed the price spike to be temporary and delayed purchases until the gasoline market had a chance to settle down. Shipments from primary supply were fairly strong during the first quarter, and downstream suppliers may not have been in critical need of supplies in mid-spring. Thus, even if secondary and tertiary suppliers were not forced to abide by the low-RVP gasoline ruling, they may have had incentives to hold off on purchases from primary supply until late in the season anyway. The RVP problem, however, directly restricted suppliers from taking delivery of the new low-vapor gasoline until separate and clear (of high vapor product) storage and transport facilities could be arranged. This presumably explains the relatively low levels of gasoline product



**Figure 10. Motor Gasoline Demand and Components**

Note: Projections begin in the third quarter of 1989.

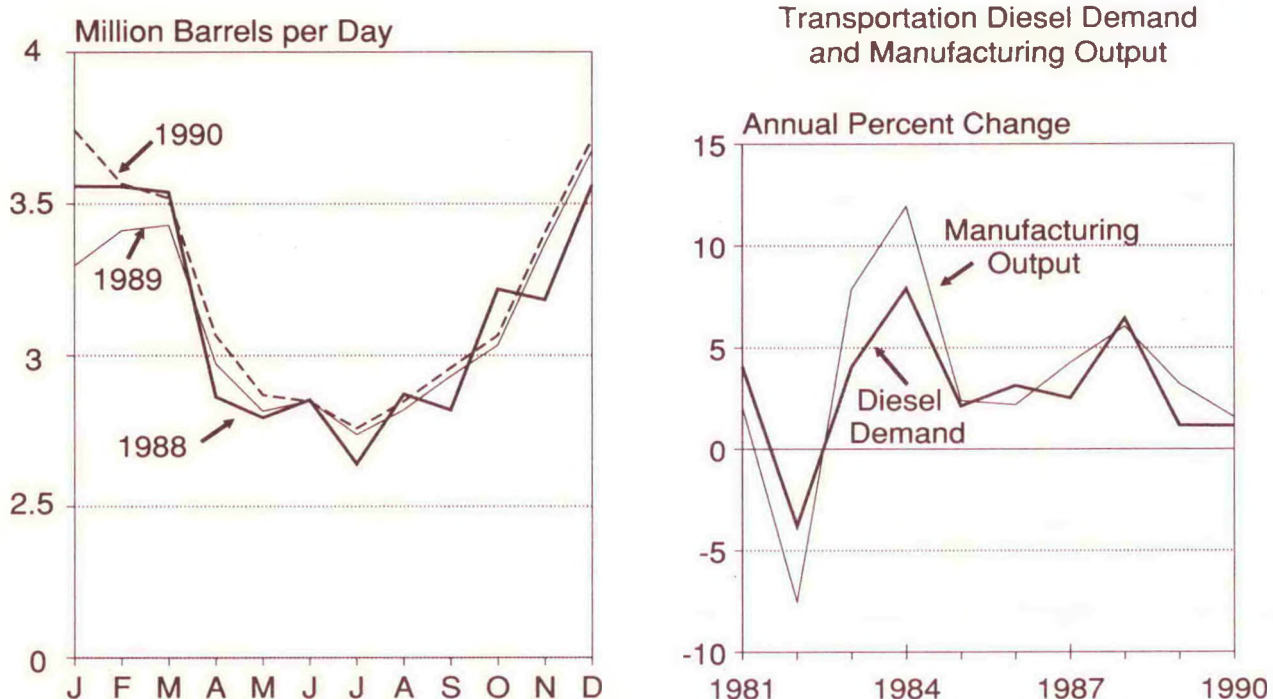
Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989).

**Projections:** Table 10.

supplied in the second quarter of this year, but argues for a sharp rebound in the summer. This kind of "see-saw" pattern in the product supplied data is inevitable, if fundamental forces in the domestic motor gasoline market occur as projected in this *Outlook*. Those fundamentals point toward an expected growth in vehicle travel of 2.8 percent this year and an additional 1.8 percent next year (Figure 10). These are not robust figures considering that travel increases since 1982 averaged 3.7 percent and never fell below 3.2 percent.<sup>10</sup> Unless average vehicle efficiency (mpg) increases at a rate that is higher than expected this year and next year, gasoline demand should continue to grow throughout the forecast period. On an annual basis, overall fleet-average mpg is expected to grow by 1.8 percent this year and 1.0 percent in 1990. Arguments in favor of relatively low and diminishing mpg growth over the forecast include the fact that, more and more, the rated efficiency of the new car fleet is not growing much at all, or is even declining.<sup>11</sup> One argument in favor of higher mpg growth is that efficiency gains in 1988 were moderated by the full implementation of the 65-mile-per-hour speed limits in many States. Thus, a rebound in vehicle efficiency beyond what is already assumed here is possible, and if it materializes, some of the expected demand may not show up.

## Distillate Fuel Oil

Conditions which led to sharply higher demand for distillate fuel oil in 1988 are expected to be largely reversed in 1989, leading to flat or declining demand. In 1990, modest growth is projected to resume, stemming from additional demand in the transportation sector and from the assumption of normal weather patterns. The latter implies a rebound during the first quarter of 1990, compared to the first quarter of 1989, when temperatures were milder than normal (Figure 11). Growth in industrial output, which contributed to higher industrial and transportation distillate use, is projected to slow over the forecast period to only a fraction of the 1988 pace. Distillate prices should be noticeably higher during



**Figure 11. Distillate Fuel Oil Demand**

Note: Projections begin with the third quarter of 1989. 1988 diesel demand is estimated from partial-year data. Data for 1989 and 1990 are estimated.

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989). **Projections:** Table 11.



the forecast period (Table 5). After annual growth in 1988 of almost 5 percent, distillate demand in 1989 is projected to drop by 0.3 percent and to increase by 2.9 percent in 1990 (Table 11). Despite the shifting influences on distillate demand in recent periods, the distribution of demand among end-use sectors is expected to be fairly constant through 1990; transportation use accounts for a little more than one-half of the total, with most remaining usage accounted for by industrial, residential, and commercial use.

Even with the expected stability of average shares of distillate use by sectors, in absolute terms diesel fuel is expected to contribute less to the growth in distillate demand over the forecast period than it has in recent years. Partial-year 1988 data show that on-highway trucking grew in close correspondence with the rate of growth in industrial output (6.0 percent in 1988).<sup>12</sup> With reduced growth in manufacturing expected (3.0 percent in 1989 and 0.8 percent in 1990), growth in diesel demand is expected to slow (Figure 11). A similar trend is projected for industrial use of distillate.

Demand for heating oil in 1989 is projected to show a decline from its 1988 estimated level, due to milder temperatures. Demand in 1990 is expected to rebound, assuming a return to more normal temperatures. The largest weather-related effect in the residential and commercial sectors occurred in the Northeast, where approximately three-quarters of household heating-oil use is concentrated.<sup>13</sup>

Heating degree-days in the Northeast during the first quarter of this year were 6.3 percent below normal, similar to weather conditions for the Nation overall. Correspondingly, refiner sales of No. 2 fuel oil in the Northeast declined by 7.9 percent.<sup>14</sup> With the number of customers remaining approximately constant in recent years, demand for heating oil has varied directly with weather conditions. Recent data indicate that a downward trend in residential customers in the early to mid-1980's seems to have leveled off. Between 1981 and 1984, the number of household customers dropped by 5 percent, due in part to higher fuel prices. Between 1984 and 1987, however, it appears that conversions to natural gas leveled off and were offset by new construction or conversions to fuel oil.<sup>15</sup> Although approximately 6 percent of households that used fuel oil to heat their homes in 1984 were using another type of energy (primarily natural gas) for heating by 1987, there was an overall 2-percent increase in the residential customer base. The data also show that between 1984 and 1987 household thermostat settings increased by almost 1 degree. The higher setting likely had an insignificant effect on heating-oil consumption; households in the coldest regions of the Northeast were the only households that did not show a significant increase in their indoor heating temperatures.

## **Residual Fuel Oil and Other Petroleum Products**

Residual fuel oil demand increased by an average of 120,000 barrels per day in 1988, led strongly by increased reliance by electric utilities on oil to produce power (Table 12). However, demand is expected to fall at an average rate of 7.9 percent during the forecast period. The main factors that increased utility oil use in 1988 will be absent or lessened in importance for the rest of this year. Hydroelectric generation is expected to increase from low, drought-induced levels to normal levels by the fourth quarter. Oil prices will not remain particularly competitive with gas, and no natural gas shortages are expected that might cause unusual restrictions on gas use by utilities.

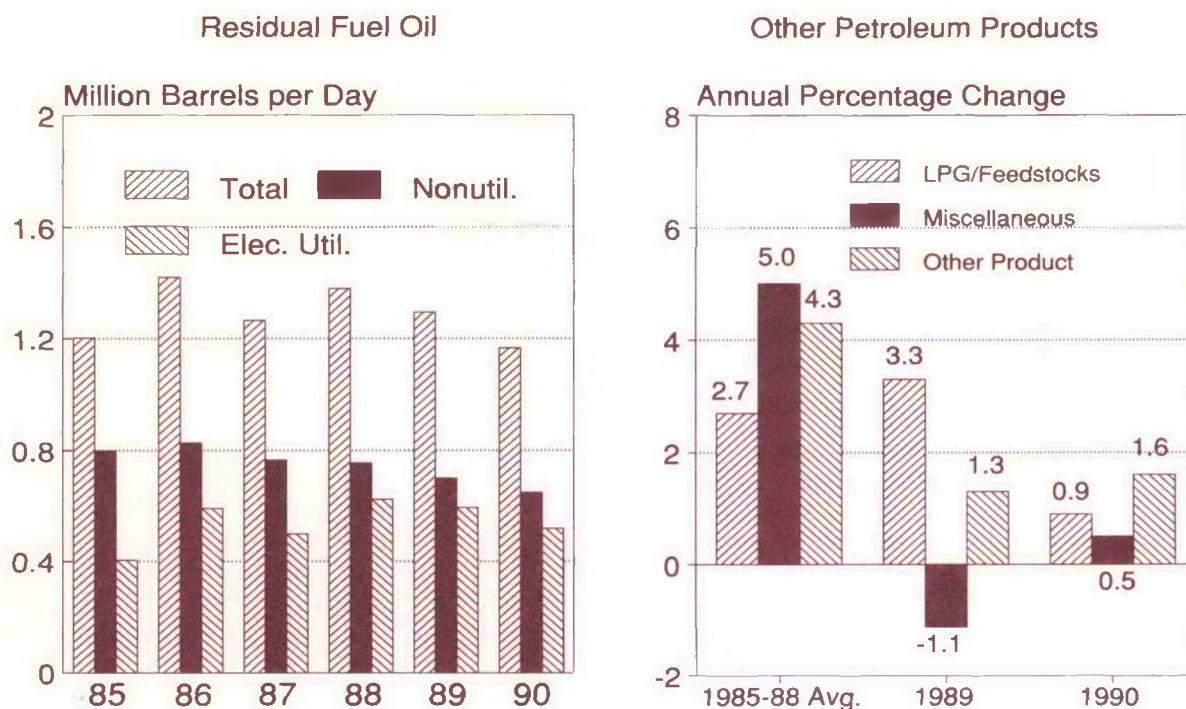
The data for 1988 show that nonutility use of residual oil has not responded much to favorable market conditions, such as the severe weather, sharply lower prices, and rapid industrial expansion. (Figure 12). Therefore, as somewhat firmer prices and sluggish economic growth prevail over the forecast, nonutility residual oil use is expected to fall by 5.3 percent this year and another 8.5 percent in 1990.

Liquefied petroleum gas benefited from increased industrial output during 1988. This was particularly true in the chemical sector where output grew at an annual rate of 8.5 percent (Table 13). Ethane and propane use for petrochemical feedstocks offset lower demand for butanes, as overall demand showed an increase of over 40,000 barrels per day during 1988. Demand growth for ethane and propane continued into the first quarter of 1989, even with mild winter temperatures that suppressed propane use as heating fuel. Again, the probable source of propane growth was the increased use of propane as a petrochemical feedstock. Chemical output grew by an additional 8.4 percent in the first quarter of 1989, and a favorable propane price along with its availability due to mild temperatures made this fuel a likely choice as a feedstock. Over the forecast period, slowing demand growth for liquefied

petroleum gas reflects underlying expectations of slower growth in industrial output, such as in the chemical industry (5.7 and 1.9 percent in 1989 and 1990, respectively).

Oil-based petrochemical feedstock has also grown significantly due to strong chemical output. Revised data for 1988 show that the demand for oil-based petrochemical feedstock was higher than previously reported. The higher demand is more consistent with what might have been expected during 1988 given favorable prices and strong chemical demand. Although any price advantage is expected to lessen this year (before returning in 1990), an improved situation in terms of the price of its chemical yield is expected to create some additional demand growth (Table 13).

Demand growth for the miscellaneous products has recently reflected higher still gas product supplied, mostly for use as a refinery fuel. Growth is expected to slow during 1989 and 1990, in part, due to slower growth in refinery production.



**Figure 12. Residual Fuel Oil and Other Petroleum Products Demands**

Note: Projections begin in the third quarter of 1989.

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04), *Petroleum Supply Annual*, DOE/EIA-0340(88/2), and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to April 1989 (Washington, DC, 1989). **Projections:** Tables 12 and 13.

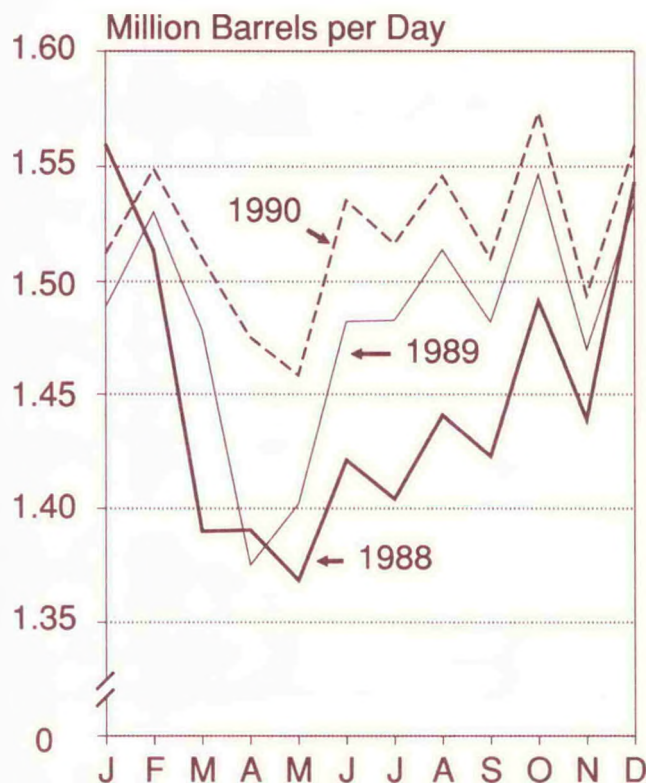
## Jet Fuel

Jet fuel demand, after showing 5.1 percent growth in 1988, is projected to grow by an average of 2.4 percent per year in 1989 and 1990 (Table 13 and Figure 13). This growth follows the pattern of growth in revenue ton-miles (a measure of airline traffic), which is projected to increase by an average of 3.6 percent per year over the same period. This rate is somewhat lower than the growth in air travel in 1988 and is significantly lower than the explosive growth in 1986 and 1987.

In recent months, passenger traffic on domestic flights has actually decreased, while domestic cargo traffic and international traffic have taken up the slack. Compared to the first quarter of 1988, revenue ton-miles grew by 3.5 percent in the first quarter of 1989.<sup>16</sup> Whereas international revenue ton-miles grew by 13 percent in this time period, domestic revenue ton-miles were virtually constant. Moreover, domestic passenger revenue ton-miles declined by 1.5 percent, while domestic cargo traffic grew by over 6 percent in the first quarter of 1989. The weakness in domestic passenger traffic may be a leading indicator of sluggishness in the demand for jet fuel, even beyond what is shown in this *Outlook*. Domestic passengers are responding negatively to the disappearance of steadily declining real ticket prices, and it appears that the growth in demand for commercial jet fuel this year is being supported entirely by growth in international and cargo traffic. The latter sources of air travel demand may tail off significantly if the economic slowdown assumed for this *Outlook* materializes, making even 3.6-percent growth in overall air travel seem on the high side.

### Update on the Eastern Strike

With March travel data available, the immediate effect of the machinist's strike at Eastern Airlines can be noted. In March 1989, revenue ton-miles declined by 259 million ton miles at Eastern, sustaining a level of traffic of only 8 percent of its level a year earlier. Moreover, on the flights that Eastern did make, load factor (a measure of capacity utilization) was significantly below year-earlier amounts. Since passengers who would have flown on Eastern filled underutilized capacity on already scheduled flights of other airlines (for the most part), passenger traffic volume has not been affected much by the strike. However, because the other major airlines have few unused aircraft, there is a decline in the number of actual aircraft flown, since Eastern's aircraft are grounded. Fewer flights should translate into less jet fuel consumed, although the size and timing of this effect are difficult to quantify and are not factored into the current forecast. Moreover, as the other airlines begin to utilize their idle aircraft, and new aircraft become available for the other airlines, this potential weakness in jet fuel demand should disappear.



**Figure 13. Jet Fuel Demand**

Note: Projections begin with the third quarter of 1989.

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340(88/2), and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to April 1989 (Washington, DC, 1989).

**Projections:** Table 13.

## **Outlook for Other Major Energy Sources**

- **Natural Gas**
- **Coal**
- **Electricity**
- **Electric Utility Fuel Consumption**



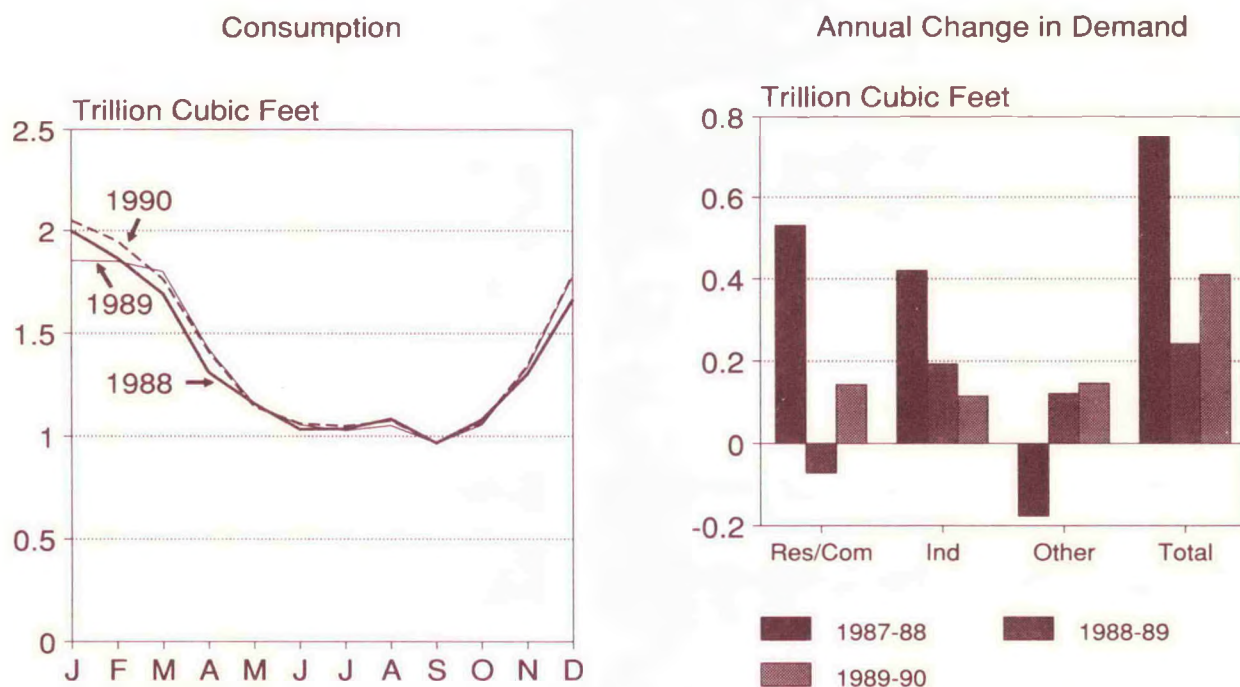
## Natural Gas

Weather and surging industrial sector growth stimulated substantial increases in domestic natural gas use in 1988. The sharp tapering-off of industrial expansion which is anticipated for this year, as well as the assumption that temperatures will turn out to be considerably milder than last year, lead to the projection of natural gas demand growth in 1989 of less than one-third the pace set in 1988 (Table 14 and Figure 14).

Revised data for 1988 indicate that overall gas demand rose by 0.75 trillion cubic feet in 1988, an increase of 4.4 percent. About 56 percent of this increase was accounted for by higher gas use in the industrial sector. The significance of weather in last year's gas demand should not be underplayed, however, since more than one-half of the annual increase occurred during the cold first quarter.<sup>17</sup> Gas use declined by 1 percent during the first quarter of this year compared to year-earlier levels, due to milder weather.

Industrial sector gas use in 1989 is expected to increase by a rate of growth that is less than one-half of last year's rate, reflecting a similar slowing in manufacturing production growth. In addition, it is assumed that normal temperatures will prevail this fall, inducing additional declines in gas use in the residential and commercial sectors from the comparatively cold fourth quarter 1988. On balance, gas use is expected to post a gain of 0.24 trillion cubic feet in 1989.

In 1990, a rebound in gas use during the first quarter, compared to the same period this year, is expected if temperatures remain in the normal range. Some additional industrial demand is projected, but the slow pace of the economy is likely to limit the contribution from this sector to 27 percent of next year's growth. Some continued (though modest) advances in electric utility gas use from the low



**Figure 14. Natural Gas Demand**

Note: Projections begin in the third quarter of 1989. The figure on the left excludes gas used as lease and plant fuel and gas consumed in pipeline operations.

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04) (Washington, DC, 1989).

**Projections:** Table 14.

levels seen in 1988 are expected through 1990. The use of natural gas at electric utilities is projected to grow by 1.5 percent per year in 1989 and by 2.2 percent in 1990. Strong growth in hydroelectric power will keep natural gas from returning to the high levels of 1987. Finally, it is assumed that the use of natural gas for lease and plant fuel and pipeline fuel will increase this year and next as gas production and transport activity increase (although no firm evidence of greater use in these areas is apparent so far in 1989). It is not expected that total gas use will increase by more than 0.41 trillion cubic feet next year, or about one-half of the increase seen in 1988.

In general, natural gas prices are expected to compare favorably with residual fuel oil prices in industrial and utility markets this year, compared to the second half of 1988. An indicator of this price development is the ratio of the price of gas to the price of oil paid by electric utilities (Table 5). This ratio is expected to decrease from 0.94 last year to 0.85 in 1989, on an average annual basis. The current outlook calls for some switching to gas from oil in the utility and industrial sectors on the basis of these price changes. Despite sharply higher average prices for oil delivered to utilities so far this year, however, little increased gas use at utilities is evident for the first half of 1989. In fact, gas use at utilities is probably slightly below the June 30 level. Aggregate data show that electric utility residual fuel oil demand remained high through much of the first half of this year, largely at the expense of gas. It is assumed that ample gas is available to meet projected demands by all sectors. For utilities, however, recent history has been characterized by localized gas supply difficulties. For example, during the first quarter of 1989, gas supplies to utilities in southern California were curtailed, because the Southern California Gas Company (SCGC) needed to provide a great deal of natural gas to residential and commercial customers due to a cold snap in February, and because SCGC made a policy decision to fill their storage capacity before supplying natural gas to electric utilities in an effort to ensure adequate supplies for the summer months as well as for the following winter.<sup>18</sup> Thus, it is not clear that the relative price movements that are projected will have as much of an effect on gas use as is anticipated in this *Outlook*, because it is not clear whether gas suppliers will be able to service desired demand levels of electric utilities. Nonutility industrial gas use seems to be increasing at least as strongly as would be expected from apparent industrial output growth. Nevertheless, a significant amount (about one-half) of this year's projected growth in gas use depends on a sharp rebound in utility use during the fourth quarter from much depressed levels last year.

## Coal

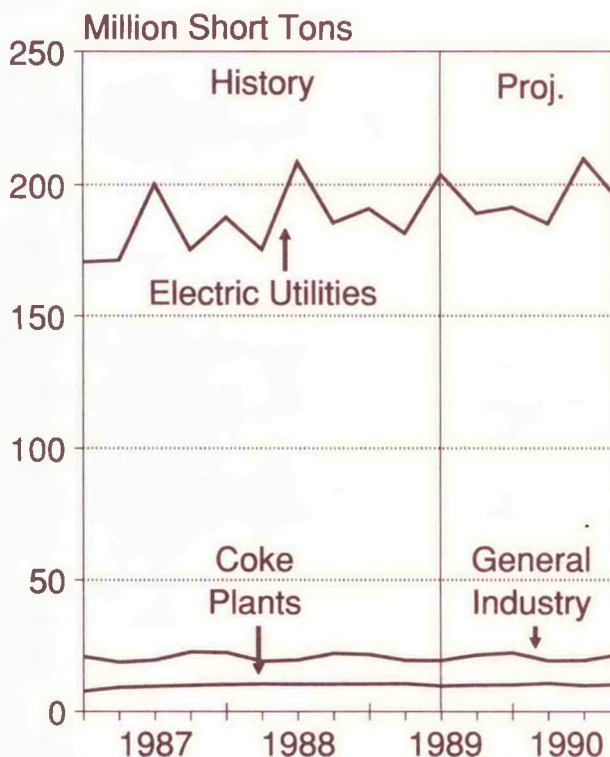
The wildcat coal strike by the United Mine Workers of America (UMWA), which began spreading during the week of June 11, 1989, in many mines east of the Mississippi River, is not explicitly considered in these projections. However, EIA estimates that the potential maximum impact would be a reduction of 20 million tons per month in coal production if the strike continued. At the end of the first quarter of this year, electric utilities had an estimated 70 days of coal supplies stockpiled—enough to allow them to manage a fairly short or selective disruption. Coke plants had only about a 30-day stockpile of coal on hand, however. Because the percentage of metallurgical coal mined by UMWA workers is higher than that for all coal, coke plants (and steel producers) are more at risk than utilities in the event of a continued strike. In addition, U.S. coal exports are reportedly feeling the impact, as some exporters have been forced to cancel shipments contracted with foreign buyers. The impact on coal prices has yet to be measured, but prices could rise sharply, depending on the miners' further actions.

Growth in total coal consumption is expected to expand by less than 1 percent in 1989 (Table 15 and Figure 16). This increase is far below the rate for 1988, when economic growth reached its highest level since 1984, and weather was more severe. Consumption of coal in the nonutility sectors should fall below last year's levels. The 1.1-percent increase in electric utility use in 1989 more than offsets the decline in the other sectors (see "Electric Utility Fuel Consumption").

Raw steel production, an indicator of metallurgical coal demand, reached the 100-million-ton mark in 1988, and, thus far in 1989, has outpaced the output of the first half of 1988.<sup>19</sup> A slowdown in economic growth in the second half of this year results in lower steel production, which causes an easing of coking coal demand. Continued high imports of metallurgical coke and the continued trend toward electric-arc furnaces in making steel should keep domestic coking coal use flat and may even fall if steel demand and production growth turn sluggish.

As the pace of industrial production slackens significantly from the 1988 level, industrial coal use decreases slightly to about 69 million tons, reflecting a declining intensity in coal use in many manufacturing industries. Consumption at coal gasification plants is assumed to be slightly less than 7 million tons in 1989 and 1990. In the residential and commercial sectors, the lower number of heating and cooling degree-days following 1988's above-normal levels should cause coal use to fall below 7 million tons.

The recent climb in the foreign exchange value of the U.S. dollar, as well as the recovery of supplies from coal-exporting countries, contributes to the projected slowdown in growth of U.S. coal exports this year and the decline in export levels in 1990.



**Figure 15. Coal Consumption**

Sources: **History:** Energy Information Administration, *Quarterly Coal Report*, DOE/EIA-0121(89/1Q) (Washington, DC, 1989).  
**Projections:** Table 15.



## Electricity

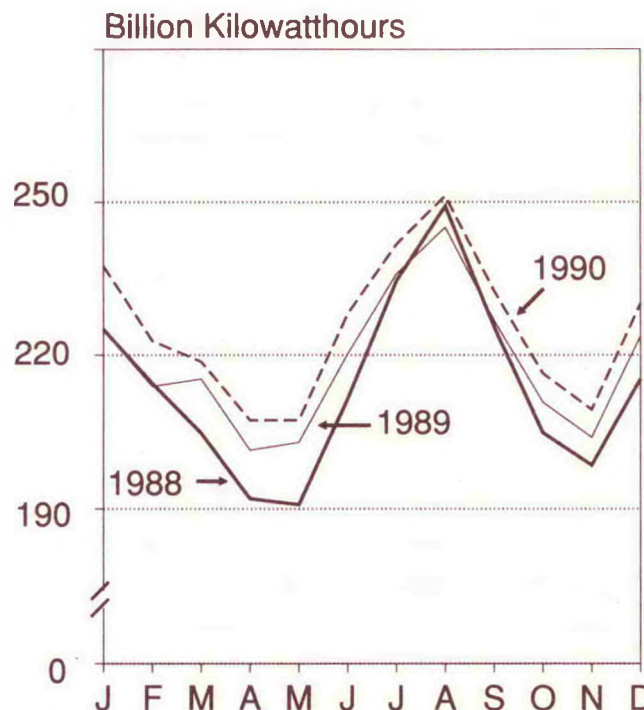
Sales of electricity are expected to register lower growth for 1989 than in 1988—2.3 percent versus 4.5 percent (Table 16). Sales in 1988 were bolstered by unusually cold weather in the first quarter, a record-setting heat wave during the third quarter, and high economic activity. None of these conditions is expected to be repeated this year.

Weather patterns this year have already diverged from last year's. Temperatures during the first quarter of 1989 were 6.4 percent milder than during the first quarter of 1988 (Table 4). Though this summer began with above-normal hot weather, temperatures are still below last year's average summer temperatures. The forecasts in this *Outlook* assume normal temperatures (hence, cooler than during the summer of 1988) for June through August of 1989. Therefore, third-quarter sales for 1989 are projected to fall from the 1988 third-quarter level (Figure 16). If temperatures for this summer average above normal, however, third-quarter sales for 1989 could reach or surpass last year's third-quarter level, or be somewhat higher than shown in this report.

Economic growth is assumed to slow in 1989 and affect electricity demand somewhat. Gross national product is projected to increase by 2.6 percent in 1989, after growing by 3.9 percent in 1988. This forecast translates into a slowdown in growth in manufacturing production from 6.0 percent in 1988 to 3.0 percent in 1989 (Table 4). Industrial electricity sales are closely linked to this sector of the economy and thus are expected to follow a similar stagnation in growth in 1989. The residential and commercial sectors are not expected to be affected heavily by these short-term fluctuations in the economy and should continue reflecting trends of increased electricity intensity of households and commercial establishments.

Electricity sales should grow by an additional 3.0 percent in 1990. On the surface, this indicates that electricity demand is not responding to lower economic growth next year (manufacturing production is projected to improve by only 0.8 percent next year), but once again weather plays an important role. Winter temperatures are expected to return to normal levels in the first quarter of 1990—colder than the first part of 1989. If temperatures were normal for all of 1989, then the 1988 to 1989 growth rate for electricity sales would be about 3.0 percent, and the 1989 to 1990 rate would be closer to 2.4 percent. Thus, after correcting for weather, electricity sales are expected to reflect a general slowing in the economy by 1990.

Domestic generation sources will provide an increased share of total supply in 1989, as net electricity imports are expected to decline again this year. This falling off in imports is the result of continued dry weather conditions in Canada (Quebec and Manitoba), strong economic growth in Ontario (which leads to high electricity demand by their own customers and less available for export), and limited access of British Columbia Hydro and Power Authority to California markets. In 1990, imports should regain their share of total domestic electricity supply.



**Figure 16. Electricity Sales**

Note: Projections begin in the third quarter of 1989.  
Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(89/04). **Projections:** Table 16.



## Electric Utility Fuel Consumption

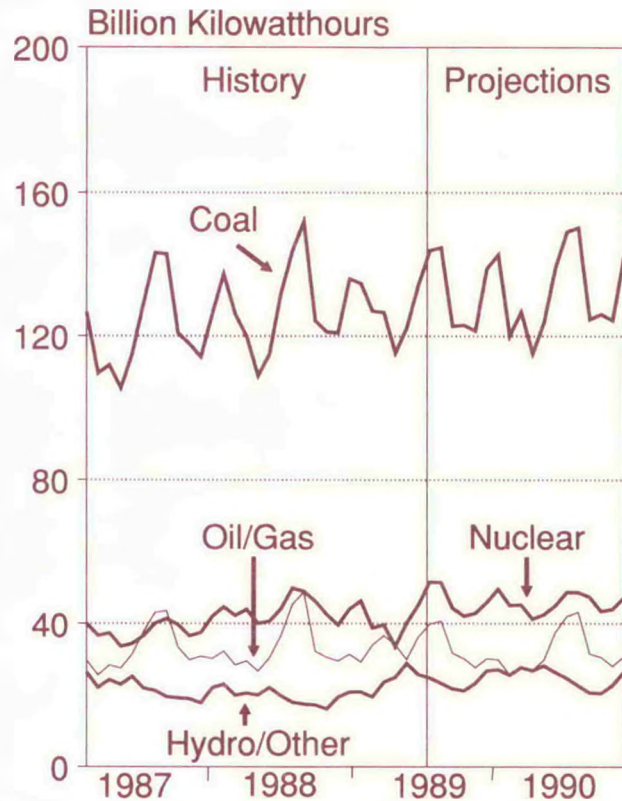
Total electricity generation is projected to increase by about 2.0 percent per year in 1989 and 1990 (Table 16). Most of this increase should be met by hydroelectric generation which is expected to rebound because of above-normal precipitation levels this spring in many areas of the country and normal precipitation levels assumed throughout the forecast period. In 1990, nuclear and coal generation are expected to grow moderately (Figure 17). Even with modest total demand growth, there could be problems in power availability in certain regions of the country. In June, voltage reductions were ordered at certain Mid-Atlantic utilities on two separate occasions.<sup>20</sup>

Above-normal precipitation levels in several major hydroelectric producing regions this spring contributed to an optimistic forecast for hydroelectric generation for the second half of 1989. Reservoir levels recovered in some of the major hydroelectric producing areas, particularly in the Pacific Northwest and in the Tennessee Valley. Assuming normal precipitation for the forecast period, hydroelectric power should reach normal levels by 1990, growing by 22 percent in 1989 and 5.0 percent in 1990.

As a result of the increased availability of hydroelectric power, coal generation is expected to grow by 1 percent in 1989 and by 2 percent in 1990. The assumption of normal weather also contributes to this conservative forecast. The recent wildcat strikes by the United Mine Workers of America (UMWA) have not yet had any major impact on the electric utility industry. Electric utility plants had, on average, over 70 days of coal supplies in their stockpiles at the end of April 1989, and the UMWA currently mines only about one-third of the total coal produced in the Nation. If the strikes continue for an extended period of time, electric utility plant operators could get coal from non-union mines, draw on their coal stockpiles, substitute other fuels for coal where the capability exists, or buy power from other power plants.

Compared with 1988, nuclear generation should remain fairly constant in 1989 due to a somewhat lower assumption for the average capacity factor, a large number of units refueling in the second quarter of 1989, and the shutdown of the Rancho Seco nuclear plant in Sacramento, California. These factors outweigh the capacity gains obtained from the addition of two units in March 1989 and one unit in November 1989. Modest growth in nuclear generation is expected in 1990, due to a projected increase in the average nuclear capacity factor and the addition of two units by 1990.

The increase in hydroelectric and nuclear generation over the forecast period lowers the need for combined petroleum and natural gas consumption at utilities. Petroleum use at electric utilities is expected to drop off in 1989 after reaching extraordinarily high levels in 1988 and early 1989. Natural gas generation should increase modestly in 1989 and 1990, however, compared to the low levels of 1988. By mid-1989, supplies of natural gas should be more available, weather patterns are presumed to be normal, and the price of oil should be substantially higher than the low levels of late 1988.



**Figure 17. Electricity Generation by Fuel Source**

Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(89/04) (Washington, DC, 1989). **Projections:** Table 16.

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10. U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (1982-1987), and monthly *Traffic Volume Reports* for 1988.
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14. Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(89/01,02,03), Table 43 (Washington, DC, 1989).
15. Energy Information Administration, *Housing Characteristics 1987*, DOE/EIA-0314(87), Tables ES1, 2, and 6 (Washington, DC, May 1989).
16. All airline traffic data are available on-line from I.P. Sharp Associates, Limited (Toronto, Canada).
17. Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130(89/04) (Washington, DC, 1989).

18. Based on a telephone conversation with a representative from the Southern California Gas Company (Los Angeles, CA).
19. American Iron and Steel Institute, Form AISI-7 (Washington, DC).
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## Detailed Tables

**Table 2. International Petroleum Balance**  
(Million Barrels per Day, Except Closing Stocks)

	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply *</b>															
Production															
U.S. (50 States) .....	10.65	10.54	10.33	10.38	10.12	10.12	10.09	10.06	10.05	9.95	9.86	9.83	10.47	10.10	9.92
OPEC .....	19.55	20.39	21.71	24.25	22.01	22.92	22.73	23.00	22.50	23.00	23.00	23.50	21.48	22.67	23.00
Other Non-OPEC .....	16.96	16.60	16.42	16.55	16.64	16.26	16.88	17.31	17.56	17.30	17.42	17.59	16.64	16.78	17.46
Total Market Economies .....	47.16	47.53	48.46	51.18	48.77	49.30	49.70	50.37	50.10	50.24	50.28	50.91	48.59	49.54	50.38
Net Communist Exports .....	2.02	2.56	2.67	2.44	2.10	2.45	2.55	2.45	2.00	2.45	2.55	2.35	2.42	2.39	2.34
Total Supply .....	49.17	50.09	51.13	53.62	50.87	51.75	52.25	52.82	52.10	52.69	52.83	53.26	51.01	51.93	52.72
<b>Net Stock Withdrawals or Additions (-)</b>															
U.S. (50 States Excluding SPR) .....	.58	-.52	-.13	.39	.38	-.60	-.10	.26	.44	-.33	-.34	.22	.08	-.01	.00
U.S. SPR .....	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.07	-.07	-.07	-.07	-.08	-.05	-.07	-.07
Other Market Economies .....	.79	-.97	-1.07	-.34	.94	-1.24	-1.02	.33	.73	-1.60	-.58	.88	-.40	-.25	-.14
Total Stock Withdrawals .....	1.32	-1.55	-1.25	.00	1.25	-1.90	-1.18	.53	1.09	-2.01	-.99	1.03	-.37	-.33	-.22
<b>Product Supplied</b>															
U.S. (50 States) .....	17.59	16.60	17.08	17.86	17.62	16.73	17.38	17.71	17.57	16.99	17.39	17.86	17.28	17.36	17.45
U.S. Territories .....	.19	.20	.20	.16	.19	.21	.21	.20	.19	.21	.21	.20	.19	.20	.20
Canada .....	1.57	1.52	1.61	1.72	1.62	1.59	1.66	1.74	1.61	1.61	1.68	1.77	1.61	1.65	1.66
Japan .....	5.27	4.18	4.31	5.33	5.47	4.48	4.55	5.46	5.64	4.46	4.64	5.57	4.77	4.99	5.07
Australia and New Zealand .....	.75	.77	.77	.79	.75	.79	.78	.80	.76	.80	.80	.82	.77	.78	.79
OECD Europe .....	12.35	11.78	12.10	13.15	12.56	11.99	12.39	13.10	12.91	12.00	12.49	13.21	12.34	12.51	12.65
Total OECD .....	37.71	35.05	36.07	39.00	38.21	35.78	36.97	39.01	38.68	36.07	37.20	39.41	36.96	37.49	37.84
Other Market Economies .....	13.78	13.90	13.84	14.07	14.29	14.38	14.38	14.62	14.81	14.90	14.91	15.17	13.90	14.42	14.95
Total Market Economies .....	51.49	48.94	49.91	53.07	52.49	50.16	51.35	53.63	53.49	50.97	52.11	54.57	50.86	51.91	52.79
<b>Statistical Discrepancy</b> .....	1.00	.40	.03	-.55	.37	.31	.28	.28	.30	.29	.27	.28	.22	.31	.28
<b>Closing Stocks (billion barrels)</b> .....	4.99	5.13	5.24	5.24	5.13	5.30	5.41	5.36	5.27	5.45	5.54	5.44	5.24	5.36	5.44

\* Includes production of crude oil and natural gas liquids, other hydrogen and hydrocarbons for refinery feedstock, refinery gains, alcohol, liquids produced from coal and other sources, and net exports from Communist 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*.

Sources: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); and *International Energy Annual 1987*, DOE/EIA-0219(87); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through December 1988.

**Table 3. International Economic Growth**  
(Percent Change from Previous Period)

	Annual Average 1977-1987	1988	1989	1990
OECD Total <sup>a</sup> .....	2.7	3.9	3.1	2.2
United States <sup>b</sup> .....	2.7	3.9	2.6	1.5
Western Europe .....	2.3	3.5	3.0	2.4
Japan .....	4.1	5.6	4.4	3.3
Other OECD <sup>c</sup> .....	3.0	3.7	2.6	1.6

<sup>a</sup> Weighted average of growth in gross national product for the United States and growth in gross domestic product for the other countries of the Organization for Economic Cooperation and Development (OECD).

<sup>b</sup> Gross national product.

<sup>c</sup> Canada, Australia, and New Zealand.

Note: Historical values are printed in **boldface**, forecasts in *italics*.

Sources: U.S. historical data and forecasts: Data Resources, Inc., United States Forecast, CONTROL0689; Non-U.S. historical data: The WEFA Group, *World Economic Service: Historical Data*, April 1989. Non-U.S. forecasts: The WEFA Group, *World Economic Outlook: Developed Economies Volume*, April 1989.

**Table 4. Macroeconomic, Oil Price, and Weather Assumptions**

Assumption	1988				1989		Case	1989		1990				Year		
	1st	2nd	3rd	4th	1st	2nd		3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
Macroeconomic <sup>a</sup>																
Real Gross National Product (billion 1982 dollars) .....	3,956	3,985	4,009	4,033	4,077	4,099	High Base Low	4,165 4,107 4,050	4,208 4,121 4,035	4,219 4,132 4,045	4,243 4,156 4,069	4,255 4,168 4,080	4,289 4,201 4,112	3,996	4,145 4,101 4,058	4,252 4,164 4,077
Percentage Change from Prior Year .....	4.8	4.2	3.7	2.8	3.0	2.9	High Base Low	3.9 2.4 1.0	4.3 2.2 .0	3.5 1.4 -.8	2.8 1.4 -.1	2.2 1.5 .8	1.9 1.9 1.9	3.9	3.7 2.6 1.6	2.6 1.5 .5
GNP Implicit Price Deflator (index, 1982=1.000) .....	1.194	1.210	1.224	1.240	1.252	1.271	High Base Low	1.282 1.287 1.293	1.288 1.297 1.305	1.301 1.310 1.319	1.316 1.325 1.334	1.332 1.341 1.350	1.344 1.353 1.362	1.217	1.273 1.277 1.281	1.323 1.332 1.341
Percentage Change from Prior Year .....	2.7	3.2	3.6	4.3	4.9	5.1	High Base Low	4.7 5.2 5.6	3.9 4.6 5.3	3.9 4.6 5.3	3.8 4.2 4.7	4.0 4.2 4.4	4.3 4.3 4.3	3.4	4.6 4.9 5.3	4.0 4.3 4.7
Real Disposable Personal Income <sup>b</sup> .....	2,762	2,762	2,800	2,828	2,882	2,872	High Base Low	2,922 2,879 2,837	2,965 2,901 2,837	2,978 2,913 2,849	2,972 2,908 2,844	2,965 2,901 2,836	2,990 2,925 2,861	2,788	2,916 2,884 2,852	2,976 2,912 2,848
Percentage Change from Prior Year .....	3.1	4.1	4.3	3.6	4.3	4.0	High Base Low	4.3 2.8 1.3	4.8 2.6 .3	3.3 1.1 -1.2	2.7 1.3 -.2	1.5 .7 .0	.8 .8 .8	3.8	4.6 3.4 2.3	2.1 1.0 -.1
Index of Industrial Production (Mfg.) .....	1.396	1.416	1.440	1.458	1.469	1.475	High Base Low	1.512 1.466 1.420	1.537 1.468 1.399	1.545 1.475 1.406	1.547 1.477 1.408	1.547 1.477 1.408	1.563 1.493 1.423	1.428	1.504 1.470 1.435	1.551 1.481 1.411
Percentage Change from Prior Year .....	6.1	6.3	6.1	5.6	5.2	4.2	High Base Low	5.0 1.8 -1.4	5.4 .7 -4.0	5.2 .5 -4.3	3.2 .1 -3.1	2.3 .8 -.8	1.7 1.7 1.7	6.0	5.4 3.0 .6	3.1 .8 -1.6
Oil Price																
Imported Crude Oil Price <sup>c</sup> (U.S. dollars/barrel) .....	15.48	15.75	14.36	13.21	16.61	18.80	Low Base High	15.00 17.00 20.00	15.00 17.00 20.00	15.00 17.00 20.00	15.00 17.00 20.00	15.00 17.00 20.00	15.00 17.00 20.00	14.64	16.40 17.40 18.90	15.00 17.00 20.00
Weather <sup>d</sup>																
Heating Degree Days .....	2,451	523	83	1,741	2,293	574		88	1,669	2,401	536	88	1,669	4,798	4,624	4,694
Cooling Degree Days .....	22	327	845	60	46	344		755	63	28	327	755	63	1,254	1,208	1,172

<sup>a</sup> Macroeconomic projections from the Data Resources, Inc., model forecasts are seasonally adjusted at annual rates and modified as appropriate to the base world oil price case. The base macroeconomic projections are then modified by the low and high world oil price cases and by various explicit economic assumptions. Low world oil prices are applied to the high macroeconomic case, and high world oil prices are applied to the low macroeconomic case.

<sup>b</sup> Seasonally adjusted at annual rates.

<sup>c</sup> Cost of imported crude oil to U.S. refiners.

<sup>d</sup> Population-weighted average degree days, revised December 1981. 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*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, June 1989; 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.12.3*, June 1989. Macroeconomic projections are based on modifications to Data Resources, Inc., Forecast CONTROL0689.

**Table 5. Energy Product Prices**  
(Nominal Dollars)

Product	1988				1989		Price Case	1989		1990				Year		
	1st	2nd	3rd	4th	1st	2nd		3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Imported Crude Oil Price <sup>a</sup></b> (dollars per barrel) .....	<b>15.48</b>	<b>15.75</b>	<b>14.36</b>	<b>13.21</b>	<b>16.81</b>	<b>18.80</b>	Low	15.00	15.00	15.00	15.00	15.00	15.00		16.40	15.00
							Base	17.00	17.00	17.00	17.00	17.00	17.00	<b>14.64</b>	17.40	17.00
							High	20.00	20.00	20.00	20.00	20.00	20.00		18.90	20.00
<b>Natural Gas Wellhead Price</b> (dollars per thousand cubic feet) .....	<b>1.87</b>	<b>1.60</b>	<b>1.60</b>	<b>1.74</b>	<b>1.82</b>	<b>1.61</b>	Low	1.60	1.78	1.80	1.59	1.63	1.90		1.72	1.71
							Base	1.70	1.97	1.99	1.73	1.77	2.08	<b>1.71</b>	1.79	1.87
							High	1.82	2.15	2.27	1.90	1.90	2.30		1.86	2.06
<b>Petroleum Products</b>																
<b>Gasoline <sup>b</sup></b> (dollars per gallon) .....	<b>.93</b>	<b>.96</b>	<b>.99</b>	<b>.97</b>	<b>.96</b>	<b>1.13</b>	Low	1.13	1.03	.94	.95	1.04	1.02		1.06	.99
							Base	1.14	1.09	1.01	1.02	1.12	1.09	<b>.96</b>	1.08	1.06
							High	1.17	1.16	1.10	1.12	1.23	1.19		1.11	1.16
<b>No. 2 Diesel Oil, Retail</b> (dollars per gallon) .....	<b>.93</b>	<b>.93</b>	<b>.90</b>	<b>.89</b>	<b>.92</b>	<b>1.00</b>	Low	.95	.92	.91	.89	.89	.91		.95	.90
							Base	.96	.95	.94	.92	.92	.94	<b>.91</b>	.96	.93
							High	.98	.99	.99	.97	.96	.99		.97	.98
<b>No. 2 Heating Oil, Wholesale</b> (dollars per gallon) .....	<b>.50</b>	<b>.49</b>	<b>.44</b>	<b>.46</b>	<b>.53</b>	<b>.55</b>	Low	.47	.50	.49	.45	.47	.51		.51	.48
							Base	.52	.56	.54	.50	.52	.56	<b>.47</b>	.54	.54
							High	.59	.65	.63	.58	.60	.65		.58	.62
<b>No. 2 Heating Oil, Retail</b> (dollars per gallon) .....	<b>.84</b>	<b>.82</b>	<b>.75</b>	<b>.78</b>	<b>.86</b>	<b>.87</b>	Low	.78	.80	.82	.78	.76	.81		.83	.80
							Base	.82	.87	.89	.85	.83	.88	<b>.81</b>	.85	.87
							High	.88	.96	.99	.94	.91	.97		.90	.96
<b>No. 6 Residual Fuel Oil <sup>c</sup></b> (dollars per barrel) .....	<b>14.76</b>	<b>13.94</b>	<b>13.67</b>	<b>13.67</b>	<b>15.11</b>	<b>17.35</b>	Low	14.96	15.10	15.44	14.08	14.37	15.13		15.49	14.81
							Base	16.29	16.97	17.36	15.83	16.15	17.00	<b>14.04</b>	16.38	16.64
							High	18.60	19.78	20.21	18.45	18.82	19.81		17.45	19.38
<b>Electric Utility Fuels</b>																
<b>Coal</b> (dollars per million Btu) .....	<b>1.48</b>	<b>1.49</b>	<b>1.45</b>	<b>1.44</b>	<b>1.45</b>	<b>1.51</b>	Low	1.48	1.46	1.47	1.51	1.49	1.50		1.48	1.49
							Base	1.50	1.50	1.51	1.55	1.54	1.54	<b>1.47</b>	1.49	1.53
							High	1.53	1.54	1.56	1.60	1.59	1.60		1.51	1.59
<b>Heavy Oil <sup>d</sup></b> (dollars per million Btu) .....	<b>2.53</b>	<b>2.37</b>	<b>2.36</b>	<b>2.39</b>	<b>2.59</b>	<b>2.91</b>	Low	2.55	2.59	2.63	2.40	2.46	2.60		2.65	2.53
							Base	2.78	2.89	2.93	2.68	2.75	2.90	<b>2.41</b>	2.77	2.82
							High	3.13	3.34	3.39	3.10	3.17	3.36		2.93	3.25
<b>Natural Gas</b> (dollars per million Btu) .....	<b>2.39</b>	<b>2.09</b>	<b>2.24</b>	<b>2.43</b>	<b>2.37</b>	<b>2.30</b>	Low	2.24	2.34	2.40	2.28	2.30	2.40		2.30	2.35
							Base	2.35	2.45	2.50	2.40	2.45	2.55	<b>2.27</b>	2.36	2.46
							High	2.46	2.56	2.62	2.52	2.60	2.70		2.43	2.59
<b>Other Residential</b>																
<b>Natural Gas</b> (dollars per thousand cubic feet) .....	<b>5.13</b>	<b>5.71</b>	<b>6.72</b>	<b>5.50</b>	<b>5.42</b>	<b>5.84</b>	Low	6.50	5.45	5.24	5.86	6.61	5.55		5.56	5.60
							Base	6.63	5.61	5.48	6.06	6.91	5.84	<b>5.46</b>	5.63	5.80
							High	6.72	5.75	5.70	6.27	7.21	6.15		5.71	6.01
<b>Electricity</b> (cents per kilowatt-hour) .....	<b>7.00</b>	<b>7.59</b>	<b>7.91</b>	<b>7.47</b>	<b>7.19</b>	<b>7.71</b>	Low	7.93	7.53	7.26	7.80	8.12	7.75		7.59	7.74
							Base	8.03	7.68	7.42	8.00	8.35	7.99	<b>7.49</b>	7.65	7.94
							High	8.11	7.82	7.59	8.20	8.57	8.23		7.69	8.14

<sup>a</sup> Cost of imported crude oil to U.S. refiners.

<sup>b</sup> Average retail for all grades and services.

<sup>c</sup> Retail residual fuel oil—average, all sulfur contents.

<sup>d</sup> Heavy fuel oil prices include fuel oils No. 4., No. 5, and No. 6, and topped crude fuel oil prices.

Notes: Second quarter 1989 is estimated. Prices exclude taxes, except gasoline, residential natural gas, and diesel prices. Historical values are printed in **boldface**, forecasts in *italics*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); and *Petroleum Marketing Monthly*, DOE/EIA-0380(89/04).

**Table 6. Supply and Disposition of Petroleum: Base Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Crude Oil Supply															
Domestic Production <sup>a</sup>	8.33	8.23	8.01	8.00	7.78	7.77	7.77	7.71	7.70	7.60	7.52	7.46	8.14	7.76	7.57
Alaska	2.05	2.01	2.00	2.01	1.87	1.94	1.95	1.93	1.90	1.89	1.87	1.86	2.02	1.92	1.88
Lower 48	6.28	6.22	6.01	5.98	5.92	5.84	5.82	5.79	5.80	5.72	5.64	5.60	6.12	5.84	5.69
Net Imports (Including SPR) <sup>b</sup>	4.54	5.15	4.98	5.14	5.09	5.70	6.01	5.59	5.14	5.62	6.22	5.95	4.95	5.60	5.74
Gross Imports															
(Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.79	6.11	5.68	5.25	5.72	6.31	6.04	5.06	5.70	5.83
SPR Imports	.05	.06	.05	.05	.07	.07	.06	.07	.07	.07	.07	.08	.05	.07	.07
Exports	.19	.13	.15	.15	.17	.16	.16	.16	.18	.17	.16	.16	.15	.16	.17
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.07	-.07	-.07	-.07	-.08	-.05	-.07	-.07
Other Stock Withdrawn or Added (-)	-.06	-.05	.33	-.02	.04	-.10	.01	.01	-.06	-.01	.06	.00	.05	-.01	.00
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.03	-.05	-.05	-.05	-.05	-.05	-.05	-.04	-.04	-.05
Unaccounted-for Crude	.15	.12	.31	.20	.23	.16	.13	.13	.15	.14	.12	.13	.20	.16	.13
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.43	13.81	13.33	12.81	13.23	13.80	13.42	13.25	13.40	13.32
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.63	1.59	1.63	1.64	1.61	1.59	1.63	1.62	1.62	1.62
Other Hydrocarbon and Alcohol Inputs	.05	.04	.06	.06	.05	.06	.06	.06	.06	.06	.06	.06	.05	.06	.06
Crude Oil Product Supplied	.05	.04	.03	.04	.05	.03	.05	.05	.05	.05	.05	.05	.04	.05	.05
Processing Gain	.66	.65	.64	.67	.65	.66	.67	.66	.65	.67	.68	.67	.66	.66	.67
Net Product Imports <sup>c</sup>	1.72	1.37	1.64	1.80	1.85	1.42	1.31	1.73	1.87	1.70	1.60	1.80	1.63	1.58	1.74
Gross Product Imports <sup>c</sup>	2.40	2.05	2.26	2.47	2.52	2.05	1.82	2.32	2.46	2.24	2.11	2.39	2.30	2.18	2.30
Product Exports	.67	.68	.62	.67	.66	.63	.52	.59	.59	.55	.52	.59	.66	.60	.56
Product Stock Withdrawn or Added (-) <sup>d</sup>	.63	-.47	-.46	.41	.34	-.50	-.11	.25	.50	-.32	-.40	.22	.03	.00	.00
Total Product Supplied,															
Domestic Use	17.59	16.60	17.08	17.86	17.61	16.73	17.38	17.71	17.57	16.99	17.39	17.86	17.28	17.36	17.45
<b>Disposition</b>															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.38	7.76	7.40	7.01	7.67	7.72	7.47	7.34	7.41	7.47
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.42	1.49	1.52	1.52	1.49	1.52	1.54	1.45	1.48	1.52
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.88	2.83	3.36	3.61	2.93	2.85	3.39	3.12	3.11	3.20
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.26	1.12	1.28	1.28	1.06	1.08	1.25	1.38	1.32	1.17
Other Oils Supplied <sup>e</sup>	3.92	3.75	4.15	4.18	4.06	3.79	4.18	4.15	4.14	3.85	4.21	4.20	4.00	4.05	4.10
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.73	17.38	17.71	17.57	16.99	17.39	17.86	17.28	17.36	17.45
<b>Total Petroleum Net Imports</b>	<b>6.26</b>	<b>6.52</b>	<b>6.62</b>	<b>6.94</b>	<b>6.95</b>	<b>7.12</b>	<b>7.32</b>	<b>7.32</b>	<b>7.01</b>	<b>7.32</b>	<b>7.82</b>	<b>7.75</b>	<b>6.59</b>	<b>7.18</b>	<b>7.48</b>
<b>Closing Stocks (million barrels)</b>															
Crude Oil (Excluding SPR) <sup>f</sup>	354	359	329	330	326	336	335	334	339	341	335	335	330	334	335
Total Motor Gasoline	232	210	221	228	230	223	222	227	232	215	221	227	228	227	227
Finished Motor Gasoline	194	175	183	190	189	185	182	189	194	179	182	190	190	189	190
Blending Components	37	35	39	39	41	37	40	38	37	36	39	37	39	38	37
Jet Fuel	46	46	47	44	44	46	48	46	45	46	47	45	44	46	45
Distillate Fuel Oil	90	110	131	124	97	104	125	126	91	103	128	128	124	126	128
Residual Fuel Oil	44	42	45	45	42	46	42	44	41	41	42	44	45	44	44
Other Oils <sup>g</sup>	249	295	301	267	264	303	295	266	255	287	292	265	267	266	265
Total Stocks (Excluding SPR)	1014	1062	1074	1038	1003	1058	1067	1043	1003	1033	1065	1044	1038	1043	1044
Crude Oil in SPR	545	550	555	560	566	572	577	584	590	597	604	610	560	584	610
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1630	1644	1626	1593	1630	1668	1654	1597	1626	1654

<sup>a</sup> Includes lease condensate.

<sup>b</sup> Net imports equals gross imports plus SPR imports minus exports.

<sup>c</sup> Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

<sup>d</sup> Includes an estimate of minor product stock change based on monthly data.

<sup>e</sup> Includes 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.

<sup>f</sup> Includes crude oil in transit to refineries.

<sup>g</sup> Includes 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*.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).



**Table 7. Petroleum Demand Sensitivities**  
(Million Barrels per Day)

Sensitivity	1989		1990				Year	
	3rd	4th	1st	2nd	3rd	4th	1989	1990
<b>Base Case</b> .....	<i>17.38</i>	<i>17.71</i>	<i>17.57</i>	<i>16.99</i>	<i>17.39</i>	<i>17.86</i>	<i>17.36</i>	<i>17.45</i>
<b>Price</b>								
Low .....	.03	.02	.04	.06	.06	.07	.02	.06
High .....	-.02	-.04	-.05	-.08	-.09	-.08	-.01	-.07
<b>Weather</b>								
Adverse .....	.07	.28	.34	.10	.07	.27	.07	.20
Favorable .....	-.06	-.22	-.28	-.08	-.06	-.23	-.06	-.16
<b>Economic</b>								
High Activity .....	.15	.26	.27	.26	.27	.28	.12	.27
Low Activity .....	-.16	-.27	-.29	-.27	-.27	-.29	-.12	-.28
<b>Range of Projected Demand</b>								
High .....	<i>17.63</i>	<i>18.27</i>	<i>18.22</i>	<i>17.41</i>	<i>17.79</i>	<i>18.48</i>	<i>17.57</i>	<i>17.98</i>
Low .....	<i>17.14</i>	<i>17.18</i>	<i>16.95</i>	<i>16.56</i>	<i>16.97</i>	<i>17.26</i>	<i>17.17</i>	<i>16.94</i>

Note: Price, weather, and economic sensitivities are the differences in petroleum consumption from the base case level given the respective assumptions. Forecast values in *italics*.

**Table 8. Supply and Disposition of Petroleum: High Demand Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Crude Oil Supply															
Domestic Production <sup>a</sup>	8.33	8.23	8.01	8.00	7.78	7.77	7.71	7.60	7.57	7.47	7.37	7.31	8.14	7.72	7.43
Alaska	2.05	2.01	2.00	2.01	1.87	1.94	1.92	1.87	1.85	1.83	1.81	1.80	2.02	1.90	1.82
Lower 48	6.28	6.22	6.01	5.98	5.92	5.84	5.80	5.73	5.72	5.64	5.56	5.51	6.12	5.82	5.61
Net Imports (Including SPR) <sup>b</sup>	4.54	5.15	4.98	5.14	5.09	5.70	6.27	6.00	5.61	5.97	6.66	6.45	4.95	5.77	6.17
Gross Imports															
(Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.79	6.37	6.09	5.72	6.07	6.74	6.54	5.08	5.86	6.27
SPR Imports	.05	.06	.05	.05	.07	.07	.06	.07	.07	.07	.07	.08	.05	.07	.07
Exports	.19	.13	.15	.15	.17	.16	.16	.16	.18	.17	.16	.16	.15	.16	.17
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.07	-.07	-.07	-.07	-.08	-.05	-.07	-.07
Other Stock Withdrawn or Added (-)	-.06	-.05	.33	-.02	.04	-.10	-.03	-.03	-.06	.02	.05	-.03	.05	-.03	-.01
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.03	-.05	-.05	-.05	-.05	-.05	-.05	-.04	-.04	-.05
Unaccounted-for Crude	.15	.12	.31	.20	.23	.16	.14	.14	.14	.13	.12	.14	.20	.16	.13
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.43	13.98	13.59	13.14	13.46	14.08	13.75	13.25	13.51	13.61
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.63	1.59	1.64	1.65	1.62	1.60	1.64	1.62	1.62	1.62
Other Hydrocarbon and Alcohol Inputs	.05	.04	.06	.06	.05	.06	.06	.06	.06	.06	.06	.07	.05	.06	.06
Crude Oil Product Supplied	.05	.04	.03	.04	.05	.03	.05	.05	.05	.05	.05	.05	.04	.05	.05
Processing Gain	.66	.65	.64	.67	.65	.66	.68	.69	.67	.68	.70	.70	.66	.67	.69
Net Product Imports <sup>c</sup>	1.72	1.37	1.64	1.80	1.85	1.42	1.49	2.11	2.14	1.86	1.72	2.10	1.63	1.72	1.95
Gross Product Imports <sup>c</sup>	2.40	2.05	2.26	2.47	2.52	2.05	2.00	2.70	2.73	2.41	2.23	2.69	2.30	2.32	2.51
Product Exports	.67	.68	.62	.67	.66	.63	.52	.59	.59	.55	.52	.59	.66	.60	.56
Product Stock Withdrawn or Added (-) <sup>d</sup>	.63	-.47	-.46	.41	.34	-.50	-.23	.14	.52	-.32	-.42	.19	.03	-.06	-.01
Total Product Supplied, Domestic Use	17.59	16.60	17.08	17.86	17.61	16.73	17.63	18.27	18.22	17.41	17.79	18.48	17.28	17.56	17.98
<b>Disposition</b>															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.38	7.77	7.44	7.06	7.73	7.78	7.54	7.34	7.42	7.53
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.42	1.51	1.55	1.57	1.54	1.58	1.60	1.45	1.50	1.57
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.88	2.90	3.58	3.85	3.07	2.96	3.62	3.12	3.18	3.37
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.26	1.21	1.41	1.43	1.14	1.18	1.38	1.38	1.37	1.28
Other Oils Supplied <sup>e</sup>	3.92	3.75	4.15	4.18	4.06	3.79	4.23	4.29	4.32	3.94	4.29	4.35	4.00	4.09	4.23
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.73	17.63	18.27	18.22	17.41	17.79	18.48	17.28	17.57	17.98
<b>Total Petroleum Net Imports</b>	<b>6.26</b>	<b>6.52</b>	<b>6.62</b>	<b>6.94</b>	<b>6.95</b>	<b>7.12</b>	<b>7.76</b>	<b>8.11</b>	<b>7.75</b>	<b>7.83</b>	<b>8.37</b>	<b>8.55</b>	<b>6.59</b>	<b>7.49</b>	<b>8.13</b>
<b>Closing Stocks (million barrels)</b>															
Crude Oil (Excluding SPR) <sup>f</sup>	354	359	329	330	326	336	338	341	346	345	341	343	330	341	343
Total Motor Gasoline	232	210	221	228	230	223	224	229	234	221	227	230	228	229	230
Finished Motor Gasoline	194	175	183	190	189	185	185	191	195	184	188	193	190	191	193
Blending Components	37	35	39	39	41	37	39	38	39	37	39	38	39	38	38
Jet Fuel	46	46	47	44	44	46	49	47	46	49	50	47	44	47	47
Distillate Fuel Oil	90	110	131	124	97	104	127	131	96	106	131	134	124	131	134
Residual Fuel Oil	44	42	45	45	42	46	46	49	45	43	46	49	45	49	49
Other Oils <sup>g</sup>	249	295	301	267	264	303	297	274	263	294	297	274	267	274	274
Total Stocks (Excluding SPR)	1014	1062	1074	1038	1003	1058	1081	1071	1030	1058	1092	1077	1038	1071	1077
Crude Oil in SPR	545	550	555	560	566	572	577	584	590	597	604	610	560	584	610
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1630	1658	1655	1620	1655	1696	1687	1597	1655	1687

<sup>a</sup> Includes lease condensate.

<sup>b</sup> Net imports equals gross imports plus SPR imports minus exports.

<sup>c</sup> Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

<sup>d</sup> Includes an estimate of minor product stock change based on monthly data.

<sup>e</sup> Includes 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.

<sup>f</sup> Includes crude oil in transit to refineries.

<sup>g</sup> Includes 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*.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).

**Table 9. Supply and Disposition of Petroleum: Low Demand Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Crude Oil Supply															
Domestic Production <sup>a</sup>	8.33	8.23	8.01	8.00	7.78	7.77	7.83	7.83	7.83	7.74	7.65	7.60	8.14	7.80	7.70
Alaska	2.05	2.01	2.00	2.01	1.87	1.94	1.98	1.96	1.93	1.92	1.90	1.88	2.02	1.94	1.91
Lower 48	6.28	6.22	6.01	5.98	5.92	5.84	5.85	5.87	5.90	5.82	5.75	5.72	6.12	5.87	5.79
Net Imports (Including SPR) <sup>b</sup>	4.54	5.15	4.98	5.14	5.09	5.70	5.76	5.17	4.67	5.27	5.80	5.45	4.95	5.43	5.30
Gross Imports (Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.79	5.85	5.26	4.78	5.36	5.88	5.54	5.06	5.52	5.39
SPR Imports	.05	.06	.05	.05	.07	.07	.06	.07	.07	.07	.07	.08	.05	.07	.07
Exports	.19	.13	.15	.15	.17	.16	.16	.16	.18	.17	.16	.16	.15	.16	.17
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.07	-.07	-.07	-.07	-.08	-.05	-.07	-.07
Other Stock Withdrawn or Added (-)	-.06	-.05	.33	-.02	.04	-.10	.06	.07	-.05	-.05	.06	.04	.05	.02	.00
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.03	-.05	-.05	-.05	-.05	-.05	-.05	-.04	-.04	-.05
Unaccounted-for Crude	.15	.12	.31	.20	.23	.16	.12	.12	.14	.14	.12	.13	.20	.16	.13
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.43	13.66	13.07	12.47	12.98	13.51	13.09	13.25	13.30	13.02
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.63	1.59	1.62	1.63	1.61	1.59	1.62	1.62	1.62	1.61
Other Hydrocarbon and Alcohol Inputs	.05	.04	.06	.06	.05	.06	.06	.06	.06	.06	.06	.06	.05	.06	.06
Crude Oil Product Supplied	.05	.04	.03	.04	.05	.03	.05	.05	.05	.05	.05	.05	.04	.05	.05
Processing Gain	.66	.65	.64	.67	.65	.66	.65	.63	.62	.65	.67	.64	.66	.65	.64
Net Product Imports <sup>c</sup>	1.72	1.37	1.64	1.80	1.85	1.42	1.11	1.44	1.64	1.57	1.45	1.54	1.63	1.45	1.55
Gross Product Imports <sup>c</sup>	2.40	2.05	2.26	2.47	2.52	2.05	1.63	2.03	2.23	2.12	1.96	2.13	2.30	2.05	2.11
Product Exports	.67	.68	.62	.67	.66	.63	.52	.59	.59	.55	.52	.59	.66	.60	.56
Product Stock Withdrawn or Added (-) <sup>d</sup>	.63	-.47	-.46	.41	.34	-.50	.02	.30	.48	-.36	-.36	.25	.03	.04	.00
Total Product Supplied, Domestic Use	17.59	16.60	17.08	17.86	17.61	16.73	17.14	17.18	16.95	16.56	16.97	17.26	17.28	17.17	16.94
<b>Disposition</b>															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.38	7.74	7.36	6.96	7.60	7.64	7.39	7.34	7.39	7.40
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.42	1.47	1.48	1.48	1.44	1.47	1.49	1.45	1.47	1.47
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.88	2.76	3.16	3.39	2.79	2.75	3.19	3.12	3.04	3.03
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.26	1.03	1.16	1.14	.98	.98	1.13	1.38	1.26	1.06
Other Oils Supplied <sup>e</sup>	3.92	3.75	4.15	4.18	4.06	3.79	4.14	4.02	3.97	3.75	4.13	4.06	4.00	4.00	3.98
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.73	17.14	17.18	16.95	16.56	16.97	17.26	17.28	17.17	16.94
<b>Total Petroleum Net Imports</b>	<b>6.26</b>	<b>6.52</b>	<b>6.62</b>	<b>6.94</b>	<b>6.95</b>	<b>7.12</b>	<b>6.87</b>	<b>6.61</b>	<b>6.31</b>	<b>6.84</b>	<b>7.25</b>	<b>6.99</b>	<b>6.59</b>	<b>6.88</b>	<b>6.85</b>
<b>Closing Stocks (million barrels)</b>															
Crude Oil (Excluding SPR) <sup>f</sup>	354	359	329	330	326	336	330	324	328	332	327	323	330	324	323
Total Motor Gasoline	232	210	221	228	230	223	221	226	231	216	220	226	228	226	226
Finished Motor Gasoline	194	175	183	190	189	185	182	188	192	179	181	188	190	188	188
Blending Components	37	35	39	39	41	37	39	38	38	37	39	37	39	38	37
Jet Fuel	46	46	47	44	44	46	48	46	44	46	48	44	44	46	44
Distillate Fuel Oil	90	110	131	124	97	104	123	124	90	101	125	125	124	124	125
Residual Fuel Oil	44	42	45	45	42	46	38	40	37	38	38	40	45	40	40
Other Oils <sup>g</sup>	249	295	301	267	264	303	290	258	248	281	285	256	267	258	256
Total Stocks (Excluding SPR)	1014	1082	1074	1038	1003	1058	1051	1017	978	1014	1042	1015	1038	1017	1015
Crude Oil in SPR	545	550	555	560	566	572	577	584	590	597	604	610	560	584	610
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1630	1628	1600	1568	1611	1645	1626	1597	1600	1626

<sup>a</sup> Includes lease condensate.

<sup>b</sup> Net imports equals gross imports plus SPR imports minus exports.

<sup>c</sup> Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

<sup>d</sup> Includes an estimate of minor product stock change based on monthly data.

<sup>e</sup> Includes 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.

<sup>f</sup> Includes crude oil in transit to refineries.

<sup>g</sup> Includes 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*.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).

**Table 10. Supply and Disposition of Motor Gasoline: Base Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Domestic Production <sup>a</sup> .....	<b>6.73</b>	<b>6.91</b>	<b>7.11</b>	<b>7.07</b>	<b>6.74</b>	<i>7.01</i>	<i>7.30</i>	<i>7.07</i>	<i>6.70</i>	<i>7.06</i>	<i>7.29</i>	<i>7.13</i>	<b>6.96</b>	<i>7.03</i>	<i>7.05</i>
Imports .....	<b>.37</b>	<b>.42</b>	<b>.47</b>	<b>.36</b>	<b>.37</b>	<i>.39</i>	<i>.43</i>	<i>.41</i>	<i>.38</i>	<i>.46</i>	<i>.47</i>	<i>.44</i>	<b>.41</b>	<i>.40</i>	<i>.44</i>
Exports .....	<b>.01</b>	<b>.03</b>	<b>.01</b>	<b>.02</b>	<b>.03</b>	<i>.05</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<b>.02</b>	<i>.03</i>	<i>.01</i>
Net Imports .....	<b>.36</b>	<b>.39</b>	<b>.46</b>	<b>.33</b>	<b>.34</b>	<i>.34</i>	<i>.42</i>	<i>.40</i>	<i>.37</i>	<i>.45</i>	<i>.46</i>	<i>.43</i>	<b>.38</b>	<i>.38</i>	<i>.43</i>
Net Withdrawals .....	<b>-.06</b>	<b>.21</b>	<b>-.08</b>	<b>-.08</b>	<b>.01</b>	<i>.04</i>	<i>.03</i>	<i>-.07</i>	<i>-.06</i>	<i>.16</i>	<i>-.03</i>	<i>-.08</i>	<b>.00</b>	<i>.00</i>	<i>.00</i>
<b>Total Primary Supply</b> .....	<b>7.02</b>	<b>7.51</b>	<b>7.48</b>	<b>7.33</b>	<b>7.08</b>	<i>7.38</i>	<i>7.76</i>	<i>7.40</i>	<i>7.01</i>	<i>7.67</i>	<i>7.72</i>	<i>7.47</i>	<b>7.34</b>	<i>7.41</i>	<i>7.47</i>
<b>Disposition</b>															
Leaded .....	<b>1.39</b>	<b>1.45</b>	<b>1.32</b>	<b>1.21</b>	<b>1.00</b>	<i>.96</i>	<i>1.12</i>	<i>1.02</i>	<i>.93</i>	<i>.97</i>	<i>.94</i>	<i>.87</i>	<b>1.34</b>	<i>1.02</i>	<i>.93</i>
Unleaded .....	<b>5.63</b>	<b>6.06</b>	<b>6.16</b>	<b>6.12</b>	<b>6.08</b>	<i>6.42</i>	<i>6.64</i>	<i>6.38</i>	<i>6.08</i>	<i>6.70</i>	<i>6.78</i>	<i>6.60</i>	<b>6.00</b>	<i>6.38</i>	<i>6.54</i>
<b>Total Product Supplied</b> .....	<b>7.02</b>	<b>7.51</b>	<b>7.48</b>	<b>7.33</b>	<b>7.08</b>	<i>7.38</i>	<i>7.76</i>	<i>7.40</i>	<i>7.01</i>	<i>7.67</i>	<i>7.72</i>	<i>7.47</i>	<b>7.34</b>	<i>7.41</i>	<i>7.47</i>
<b>Stocks</b>															
Primary Finished Stock Levels <sup>b</sup> (million barrels)															
Opening .....	<b>188.8</b>	<b>194.4</b>	<b>174.9</b>	<b>182.7</b>	<b>189.9</b>	<i>189.0</i>	<i>185.2</i>	<i>182.3</i>	<i>188.9</i>	<i>194.3</i>	<i>179.4</i>	<i>182.0</i>	<b>188.8</b>	<i>189.9</i>	<i>188.9</i>
Closing .....	<b>194.4</b>	<b>174.9</b>	<b>182.7</b>	<b>189.9</b>	<b>189.0</b>	<i>185.2</i>	<i>182.3</i>	<i>188.9</i>	<i>194.3</i>	<i>179.4</i>	<i>182.0</i>	<i>189.7</i>	<b>189.9</b>	<i>188.9</i>	<i>189.7</i>

<sup>a</sup> Refinery Production plus production at natural gas processing plants.

<sup>b</sup> Includes stocks at natural gas processing plants. Excludes stocks of reclassified motor gasoline blending components.

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).

**Table 11. Supply and Disposition of Distillate Fuel Oil: Base Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Refinery Output .....	<b>2.80</b>	<b>2.90</b>	<b>2.80</b>	<b>2.93</b>	<b>2.83</b>	<i>2.77</i>	<i>2.84</i>	<i>3.03</i>	<i>2.94</i>	<i>2.82</i>	<i>2.88</i>	<i>3.06</i>	<b>2.86</b>	<i>2.87</i>	<i>2.92</i>
Imports .....	<b>.35</b>	<b>.23</b>	<b>.27</b>	<b>.36</b>	<b>.37</b>	<i>.26</i>	<i>.29</i>	<i>.40</i>	<i>.38</i>	<i>.30</i>	<i>.31</i>	<i>.40</i>	<b>.30</b>	<i>.33</i>	<i>.35</i>
Exports .....	<b>.09</b>	<b>.06</b>	<b>.07</b>	<b>.06</b>	<b>.11</b>	<i>.07</i>	<i>.07</i>	<i>.07</i>	<i>.09</i>	<i>.06</i>	<i>.07</i>	<i>.07</i>	<b>.07</b>	<i>.08</i>	<i>.07</i>
Net Imports .....	<b>.26</b>	<b>.16</b>	<b>.20</b>	<b>.30</b>	<b>.25</b>	<i>.19</i>	<i>.22</i>	<i>.34</i>	<i>.29</i>	<i>.24</i>	<i>.24</i>	<i>.34</i>	<b>.23</b>	<i>.25</i>	<i>.28</i>
Net Withdrawals .....	<b>.49</b>	<b>-.23</b>	<b>-.23</b>	<b>.09</b>	<b>.30</b>	<i>-.08</i>	<i>-.23</i>	<i>-.01</i>	<i>.38</i>	<i>-.13</i>	<i>-.27</i>	<i>.00</i>	<b>.03</b>	<i>-.01</i>	<i>-.01</i>
<b>Disposition</b>															
Electric Utility Consumption .....	<b>.05</b>	<b>.04</b>	<b>.07</b>	<b>.05</b>	<b>.08</b>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<b>.05</b>	<i>.05</i>	<i>.05</i>
Utility Stock Additions .....	<b>-.01</b>	<b>.00</b>	<b>.00</b>	<b>.00</b>	<b>-.02</b>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<b>.00</b>	<i>.00</i>	<i>.00</i>
Electric Utility Shipments .....	<b>.04</b>	<b>.04</b>	<b>.07</b>	<b>.04</b>	<b>.06</b>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<b>.05</b>	<i>.05</i>	<i>.05</i>
Nonutility Shipments .....	<b>3.51</b>	<b>2.80</b>	<b>2.71</b>	<b>3.28</b>	<b>3.32</b>	<i>2.84</i>	<i>2.78</i>	<i>3.31</i>	<i>3.57</i>	<i>2.89</i>	<i>2.81</i>	<i>3.35</i>	<b>3.07</b>	<i>3.06</i>	<i>3.15</i>
<b>Total Product Supplied .....</b>	<b>3.55</b>	<b>2.84</b>	<b>2.78</b>	<b>3.32</b>	<b>3.38</b>	<i>2.88</i>	<i>2.83</i>	<i>3.36</i>	<i>3.61</i>	<i>2.93</i>	<i>2.85</i>	<i>3.39</i>	<b>3.12</b>	<i>3.11</i>	<i>3.20</i>
<b>Stocks</b>															
Electric Utility Stock Levels (million barrels)															
Opening .....	<b>15.8</b>	<b>15.2</b>	<b>15.3</b>	<b>15.5</b>	<b>15.1</b>	<i>13.4</i>	<i>13.7</i>	<i>13.7</i>	<i>13.6</i>	<i>13.6</i>	<i>13.4</i>	<i>13.3</i>	<b>15.8</b>	<i>15.1</i>	<i>13.6</i>
Closing .....	<b>15.2</b>	<b>15.3</b>	<b>15.5</b>	<b>15.1</b>	<b>13.4</b>	<i>13.7</i>	<i>13.7</i>	<i>13.6</i>	<i>13.6</i>	<i>13.4</i>	<i>13.3</i>	<i>13.2</i>	<b>15.1</b>	<i>13.6</i>	<i>13.2</i>
Primary Stock Levels (million barrels)															
Opening .....	<b>134.5</b>	<b>89.8</b>	<b>110.4</b>	<b>131.5</b>	<b>123.5</b>	<i>96.6</i>	<i>104.1</i>	<i>125.3</i>	<i>125.8</i>	<i>91.4</i>	<i>103.0</i>	<i>127.8</i>	<b>134.5</b>	<i>123.5</i>	<i>125.8</i>
Closing .....	<b>89.8</b>	<b>110.4</b>	<b>131.5</b>	<b>123.5</b>	<b>96.6</b>	<i>104.1</i>	<i>125.3</i>	<i>125.8</i>	<i>91.4</i>	<i>103.0</i>	<i>127.8</i>	<i>127.7</i>	<b>123.5</b>	<i>125.8</i>	<i>127.7</i>

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*.  
Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Monthly Energy Review*, DOE/EIA-0035(89/04); *Electric Power Monthly*, DOE/EIA-0226(89/04); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).



**Table 12. Supply and Disposition of Residual Fuel Oil: Base Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Refinery Output .....	<b>0.98</b>	<b>0.90</b>	<b>0.88</b>	<b>0.95</b>	<b>0.94</b>	<i>0.93</i>	<i>0.89</i>	<i>0.91</i>	<i>0.84</i>	<i>0.79</i>	<i>0.87</i>	<i>0.90</i>	<b>0.93</b>	<i>0.92</i>	<i>0.85</i>
Imports .....	<b>.78</b>	<b>.42</b>	<b>.58</b>	<b>.79</b>	<b>.81</b>	<i>.56</i>	<i>.34</i>	<i>.60</i>	<i>.60</i>	<i>.45</i>	<i>.38</i>	<i>.58</i>	<b>.64</b>	<i>.58</i>	<i>.50</i>
Exports .....	<b>.19</b>	<b>.23</b>	<b>.18</b>	<b>.20</b>	<b>.17</b>	<i>.18</i>	<i>.16</i>	<i>.20</i>	<i>.20</i>	<i>.18</i>	<i>.16</i>	<i>.20</i>	<b>.20</b>	<i>.18</i>	<i>.19</i>
Net Imports .....	<b>.59</b>	<b>.19</b>	<b>.41</b>	<b>.59</b>	<b>.64</b>	<i>.38</i>	<i>.18</i>	<i>.40</i>	<i>.41</i>	<i>.26</i>	<i>.22</i>	<i>.38</i>	<b>.44</b>	<i>.40</i>	<i>.32</i>
Net Withdrawals .....	<b>.04</b>	<b>.02</b>	<b>-.03</b>	<b>.00</b>	<b>.02</b>	<i>-.04</i>	<i>.05</i>	<i>-.03</i>	<i>.04</i>	<i>.00</i>	<i>-.01</i>	<i>-.03</i>	<b>.01</b>	<i>.00</i>	<i>.00</i>
<b>Disposition</b>															
Electric Utility Consumption .....	<b>.64</b>	<b>.41</b>	<b>.67</b>	<b>.79</b>	<b>.84</b>	<i>.51</i>	<i>.54</i>	<i>.54</i>	<i>.48</i>	<i>.48</i>	<i>.56</i>	<i>.55</i>	<b>.63</b>	<i>.61</i>	<i>.52</i>
Utility Stock Additions .....	<b>-.03</b>	<b>.01</b>	<b>.01</b>	<b>.00</b>	<b>-.10</b>	<i>.06</i>	<i>.01</i>	<i>.01</i>	<i>.00</i>	<i>-.01</i>	<i>.00</i>	<i>.01</i>	<b>.00</b>	<i>.00</i>	<i>.00</i>
Electric Utility Shipments .....	<b>.60</b>	<b>.43</b>	<b>.68</b>	<b>.78</b>	<b>.74</b>	<i>.57</i>	<i>.55</i>	<i>.55</i>	<i>.48</i>	<i>.46</i>	<i>.56</i>	<i>.56</i>	<b>.62</b>	<i>.60</i>	<i>.52</i>
Nonutility Shipments .....	<b>1.01</b>	<b>.68</b>	<b>.58</b>	<b>.75</b>	<b>.87</b>	<i>.69</i>	<i>.57</i>	<i>.73</i>	<i>.80</i>	<i>.60</i>	<i>.52</i>	<i>.68</i>	<b>.75</b>	<i>.71</i>	<i>.65</i>
<b>Total Product Supplied .....</b>	<b>1.61</b>	<b>1.11</b>	<b>1.26</b>	<b>1.53</b>	<b>1.60</b>	<i>1.26</i>	<i>1.12</i>	<i>1.28</i>	<i>1.28</i>	<i>1.06</i>	<i>1.08</i>	<i>1.25</i>	<b>1.38</b>	<i>1.32</i>	<i>1.17</i>
<b>Stocks</b>															
Electric Utility Stock Levels (million barrels)															
Opening .....	<b>55.1</b>	<b>52.2</b>	<b>53.5</b>	<b>54.6</b>	<b>54.2</b>	<i>45.1</i>	<i>50.7</i>	<i>51.7</i>	<i>52.8</i>	<i>52.8</i>	<i>51.5</i>	<i>51.8</i>	<b>55.1</b>	<i>54.2</i>	<i>52.8</i>
Closing .....	<b>52.2</b>	<b>53.5</b>	<b>54.6</b>	<b>54.2</b>	<b>45.1</b>	<i>50.7</i>	<i>51.7</i>	<i>52.8</i>	<i>52.8</i>	<i>51.5</i>	<i>51.8</i>	<i>53.1</i>	<b>54.2</b>	<i>52.8</i>	<i>53.1</i>
Primary Stock Levels (million barrels)															
Opening .....	<b>47.4</b>	<b>43.7</b>	<b>42.2</b>	<b>44.6</b>	<b>44.6</b>	<i>42.4</i>	<i>46.4</i>	<i>41.9</i>	<i>44.5</i>	<i>40.9</i>	<i>40.9</i>	<i>41.8</i>	<b>47.4</b>	<i>44.6</i>	<i>44.5</i>
Closing .....	<b>43.7</b>	<b>42.2</b>	<b>44.6</b>	<b>44.6</b>	<b>42.4</b>	<i>46.4</i>	<i>41.9</i>	<i>44.5</i>	<i>40.9</i>	<i>40.9</i>	<i>41.8</i>	<i>44.5</i>	<b>44.6</b>	<i>44.5</i>	<i>44.5</i>

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*.  
Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; *Monthly Energy Review*, DOE/EIA-0035(89/04); *Electric Power Monthly*, DOE/EIA-0226(89/04); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).

**Table 13. Supply and Disposition of Other Petroleum Products:<sup>a</sup> Base Case**  
(Million Barrels per Day, Except Stocks)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Net Refinery Output <sup>b</sup> .....	<b>3.02</b>	<b>3.29</b>	<b>3.40</b>	<b>2.94</b>	<b>3.18</b>	<i>3.38</i>	<i>3.45</i>	<i>2.97</i>	<i>2.98</i>	<i>3.23</i>	<i>3.45</i>	<i>3.00</i>	<b>3.16</b>	<i>3.24</i>	<i>3.17</i>
Natural Gas Plant Output .....	<b>1.60</b>	<b>1.62</b>	<b>1.62</b>	<b>1.65</b>	<b>1.64</b>	<i>1.63</i>	<i>1.59</i>	<i>1.63</i>	<i>1.64</i>	<i>1.61</i>	<i>1.59</i>	<i>1.63</i>	<b>1.62</b>	<i>1.62</i>	<i>1.62</i>
Other Domestic <sup>c</sup> .....	<b>.05</b>	<b>.04</b>	<b>.06</b>	<b>.06</b>	<b>.05</b>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<b>.05</b>	<i>.06</i>	<i>.06</i>
Net Imports .....	<b>.52</b>	<b>.63</b>	<b>.57</b>	<b>.58</b>	<b>.62</b>	<i>.51</i>	<i>.48</i>	<i>.60</i>	<i>.80</i>	<i>.74</i>	<i>.68</i>	<i>.66</i>	<b>.57</b>	<i>.55</i>	<i>.72</i>
Net Withdrawals .....	<b>.16</b>	<b>-.47</b>	<b>-.12</b>	<b>.40</b>	<b>.01</b>	<i>-.41</i>	<i>.04</i>	<i>.36</i>	<i>.14</i>	<i>-.36</i>	<i>-.10</i>	<i>.33</i>	<b>-.01</b>	<i>.00</i>	<i>.01</i>
<b>Total Primary Supply</b> .....	<b>5.36</b>	<b>5.10</b>	<b>5.54</b>	<b>5.63</b>	<b>5.50</b>	<i>5.17</i>	<i>5.62</i>	<i>5.62</i>	<i>5.62</i>	<i>5.29</i>	<i>5.69</i>	<i>5.69</i>	<b>5.41</b>	<i>5.48</i>	<i>5.57</i>
<b>Disposition</b>															
Jet Fuel .....	<b>1.49</b>	<b>1.39</b>	<b>1.42</b>	<b>1.49</b>	<b>1.50</b>	<i>1.42</i>	<i>1.49</i>	<i>1.52</i>	<i>1.52</i>	<i>1.49</i>	<i>1.52</i>	<i>1.54</i>	<b>1.45</b>	<i>1.48</i>	<i>1.52</i>
Liquefied Petroleum Gas <sup>d</sup> .....	<b>1.91</b>	<b>1.33</b>	<b>1.53</b>	<b>1.85</b>	<b>1.97</b>	<i>1.43</i>	<i>1.59</i>	<i>1.92</i>	<i>2.00</i>	<i>1.43</i>	<i>1.60</i>	<i>1.94</i>	<b>1.66</b>	<i>1.73</i>	<i>1.74</i>
Petrochemical Feedstocks <sup>e</sup> .....	<b>.46</b>	<b>.47</b>	<b>.46</b>	<b>.45</b>	<b>.48</b>	<i>.47</i>	<i>.46</i>	<i>.41</i>	<i>.50</i>	<i>.51</i>	<i>.47</i>	<i>.42</i>	<b>.46</b>	<i>.46</i>	<i>.47</i>
Miscellaneous <sup>f</sup> .....	<b>1.51</b>	<b>1.91</b>	<b>2.12</b>	<b>1.84</b>	<b>1.57</b>	<i>1.85</i>	<i>2.08</i>	<i>1.77</i>	<i>1.59</i>	<i>1.86</i>	<i>2.09</i>	<i>1.78</i>	<b>1.84</b>	<i>1.82</i>	<i>1.83</i>
<b>Total Product Supplied</b> .....	<b>5.36</b>	<b>5.10</b>	<b>5.54</b>	<b>5.63</b>	<b>5.52</b>	<i>5.17</i>	<i>5.62</i>	<i>5.62</i>	<i>5.62</i>	<i>5.29</i>	<i>5.69</i>	<i>5.69</i>	<b>5.41</b>	<i>5.48</i>	<i>5.57</i>
<b>Stocks</b>															
Primary Stocks															
(million barrels)															
Opening .....	<b>347.1</b>	<b>332.3</b>	<b>375.4</b>	<b>386.5</b>	<b>349.4</b>	<i>348.9</i>	<i>386.4</i>	<i>382.5</i>	<i>349.4</i>	<i>337.0</i>	<i>369.3</i>	<i>378.1</i>	<b>347.1</b>	<i>349.4</i>	<i>349.4</i>
Closing .....	<b>332.3</b>	<b>375.4</b>	<b>386.5</b>	<b>349.4</b>	<b>348.9</b>	<i>386.4</i>	<i>382.5</i>	<i>349.4</i>	<i>337.0</i>	<i>369.3</i>	<i>378.1</i>	<i>347.4</i>	<b>349.4</b>	<i>349.4</i>	<i>347.4</i>

<sup>a</sup> Excludes crude oil product supplied and other components of the crude oil supply/demand balance, all of which are accounted for under the total petroleum supply and disposition table.

<sup>b</sup> Includes refinery production of all other products less natural gas liquids, liquefied refinery gases, and "other liquids" input to refineries.

<sup>c</sup> Field production of other hydrocarbons and alcohol.

<sup>d</sup> Includes ethane, propane, normal butane, and isobutane.

<sup>e</sup> Includes naphthas and other oils designated for petrochemical feedstock use.

<sup>f</sup> Includes all petroleum products supplied except motor gasoline, distillate, residual fuel, liquefied petroleum gases, petrochemical feedstocks, and jet fuel.

Notes: Historical values are printed in **boldface**, forecasts in *italics*. Data for May and June 1989 are preliminary.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, Jan. 1989 to Apr. 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-24,28).

**Table 14. Supply and Disposition of Natural Gas**  
(Trillion Cubic Feet)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Total Dry Gas Production <sup>a</sup> .....	<b>4.40</b>	<b>4.03</b>	<b>3.91</b>	<b>4.30</b>	<b>4.34</b>	<i>4.11</i>	<i>4.05</i>	<i>4.43</i>	<i>4.52</i>	<i>4.18</i>	<i>4.07</i>	<i>4.43</i>	<b>16.64</b>	<i>16.94</i>	<i>17.21</i>
Net Imports .....	<b>.35</b>	<b>.26</b>	<b>.27</b>	<b>.33</b>	<b>.33</b>	<i>.31</i>	<i>.29</i>	<i>.34</i>	<i>.40</i>	<i>.35</i>	<i>.32</i>	<i>.36</i>	<b>1.21</b>	<i>1.26</i>	<i>1.43</i>
Supplemental Gaseous Fuels .....	<b>.04</b>	<b>.03</b>	<b>.03</b>	<b>.04</b>	<b>.05</b>	<i>.04</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.04</i>	<i>.05</i>	<b>.14</b>	<i>.17</i>	<i>.18</i>
Total New Supply .....	<b>4.80</b>	<b>4.32</b>	<b>4.21</b>	<b>4.68</b>	<b>4.71</b>	<i>4.46</i>	<i>4.38</i>	<i>4.82</i>	<i>4.97</i>	<i>4.57</i>	<i>4.43</i>	<i>4.84</i>	<b>17.99</b>	<i>18.36</i>	<i>18.82</i>
<b>Underground Working Gas Storage</b>															
Opening .....	<b>2.76</b>	<b>1.68</b>	<b>2.29</b>	<b>3.12</b>	<b>2.87</b>	<i>1.77</i>	<i>2.27</i>	<i>3.09</i>	<i>2.72</i>	<i>1.69</i>	<i>2.26</i>	<i>3.09</i>	<b>2.76</b>	<i>2.87</i>	<i>2.72</i>
Closing .....	<b>1.88</b>	<b>2.29</b>	<b>3.12</b>	<b>2.87</b>	<b>1.77</b>	<i>2.27</i>	<i>3.09</i>	<i>2.72</i>	<i>1.69</i>	<i>2.26</i>	<i>3.09</i>	<i>2.72</i>	<b>2.87</b>	<i>2.72</i>	<i>2.72</i>
Net Withdrawals <sup>b</sup> .....	<b>1.08</b>	<b>-.61</b>	<b>-.83</b>	<b>.23</b>	<b>1.10</b>	<i>-.53</i>	<i>-.82</i>	<i>.37</i>	<i>1.03</i>	<i>-.58</i>	<i>-.82</i>	<i>.37</i>	<b>-.12</b>	<i>.11</i>	<i>.00</i>
Total Primary Supply <sup>a</sup> .....	<b>5.87</b>	<b>3.72</b>	<b>3.38</b>	<b>4.90</b>	<b>5.81</b>	<i>3.93</i>	<i>3.56</i>	<i>5.18</i>	<i>6.01</i>	<i>4.00</i>	<i>3.60</i>	<i>5.21</i>	<b>17.87</b>	<i>18.47</i>	<i>18.82</i>
<b>Consumption</b>															
Lease and Plant Fuel .....	<b>.31</b>	<b>.28</b>	<b>.27</b>	<b>.30</b>	<b>.30</b>	<i>.29</i>	<i>.30</i>	<i>.33</i>	<i>.35</i>	<i>.31</i>	<i>.30</i>	<i>.33</i>	<b>1.16</b>	<i>1.22</i>	<i>1.29</i>
Pipeline Use .....	<b>.15</b>	<b>.13</b>	<b>.13</b>	<b>.14</b>	<b>.15</b>	<i>.13</i>	<i>.14</i>	<i>.15</i>	<i>.16</i>	<i>.14</i>	<i>.14</i>	<i>.15</i>	<b>.54</b>	<i>.56</i>	<i>.58</i>
Residential .....	<b>2.19</b>	<b>.81</b>	<b>.37</b>	<b>1.26</b>	<b>2.14</b>	<i>.86</i>	<i>.35</i>	<i>1.24</i>	<i>2.25</i>	<i>.86</i>	<i>.35</i>	<i>1.24</i>	<b>4.63</b>	<i>4.59</i>	<i>4.70</i>
Commercial .....	<b>1.12</b>	<b>.49</b>	<b>.33</b>	<b>.69</b>	<b>1.09</b>	<i>.51</i>	<i>.32</i>	<i>.66</i>	<i>1.13</i>	<i>.50</i>	<i>.32</i>	<i>.67</i>	<b>2.62</b>	<i>2.59</i>	<i>2.62</i>
Industrial .....	<b>1.71</b>	<b>1.48</b>	<b>1.49</b>	<b>1.63</b>	<b>1.74</b>	<i>1.53</i>	<i>1.54</i>	<i>1.68</i>	<i>1.81</i>	<i>1.57</i>	<i>1.55</i>	<i>1.69</i>	<b>6.31</b>	<i>6.50</i>	<i>6.61</i>
Electric Utilities .....	<b>.54</b>	<b>.72</b>	<b>.91</b>	<b>.47</b>	<b>.53</b>	<i>.73</i>	<i>.84</i>	<i>.58</i>	<i>.58</i>	<i>.69</i>	<i>.87</i>	<i>.59</i>	<b>2.63</b>	<i>2.67</i>	<i>2.73</i>
Subtotal .....	<b>6.01</b>	<b>3.91</b>	<b>3.49</b>	<b>4.48</b>	<b>5.95</b>	<i>4.05</i>	<i>3.48</i>	<i>4.64</i>	<i>6.27</i>	<i>4.06</i>	<i>3.53</i>	<i>4.67</i>	<b>17.89</b>	<i>18.13</i>	<i>18.54</i>
Total Disposition .....	<b>5.87</b>	<b>3.72</b>	<b>3.38</b>	<b>4.90</b>	<b>5.81</b>	<i>3.93</i>	<i>3.56</i>	<i>5.18</i>	<i>6.01</i>	<i>4.00</i>	<i>3.60</i>	<i>5.21</i>	<b>17.87</b>	<i>18.47</i>	<i>18.82</i>
Unaccounted for .....	<b>-.14</b>	<b>-.19</b>	<b>-.11</b>	<b>.41</b>	<b>-.14</b>	<i>-.13</i>	<i>.07</i>	<i>.54</i>	<i>-.27</i>	<i>-.06</i>	<i>.07</i>	<i>.54</i>	<b>-.02</b>	<i>.34</i>	<i>.28</i>

<sup>a</sup> Excludes nonhydrocarbon gases removed.

<sup>b</sup> Net 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.

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); *Natural Gas Monthly*, DOE/EIA-0130(89/04); and *Electric Power Monthly*, DOE/EIA-0226(89/04).

**Table 15. Supply and Disposition of Coal**  
(Million Short Tons)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Supply</b>															
Production .....	237	227	241	245	247	243	240	253	246	251	242	255	950	983	995
Primary Stock Levels <sup>a</sup>															
Opening .....	28	37	36	31	30	35	33	31	29	28	27	27	28	30	29
Closing .....	37	36	31	30	35	33	31	29	28	27	27	27	30	29	27
Net Withdrawals .....	-8	1	5	1	-5	2	2	2	1	1	0	0	-2	1	2
Imports .....	1	1	0	1	1	1	1	1	1	1	1	1	2	2	3
Exports .....	16	25	28	26	21	25	24	24	20	25	24	24	95	96	93
Total New Domestic Supply .....	213	203	219	220	221	221	219	231	228	228	219	231	855	892	907
 Secondary Stock Levels <sup>b</sup>															
Opening .....	185	175	173	154	158	149	158	143	154	158	171	150	185	158	154
Closing .....	175	173	154	158	149	158	143	154	158	171	150	156	158	154	156
Net Withdrawals .....	10	2	19	-4	9	-9	14	-10	-4	-13	21	-6	27	4	-2
 Total Indicated Consumption .....	223	205	238	216	230	212	233	221	224	216	239	226	882	896	905
 <b>Consumption</b>															
Coke Plants .....	10	11	10	11	11	11	10	10	10	11	10	10	42	41	41
Electric Utilities .....	188	176	208	188	191	182	204	189	192	185	210	194	758	766	780
Retail and General Industry <sup>c</sup> .....	22	19	20	22	22	20	19	22	22	19	19	22	83	82	83
Subtotal .....	221	205	239	218	223	212	233	221	224	216	239	226	883	889	905
 Total Disposition .....	223	205	238	216	230	212	233	221	224	216	239	226	882	896	905
 Discrepancy <sup>d</sup> .....	2	0	-1	-2	7	0	0	0	0	0	0	0	-1	7	0

<sup>a</sup> Primary stocks are held at the mines, preparation plants, and distribution points.

<sup>b</sup> Secondary stocks are held by users. Most of the secondary stocks are held by electric utilities.

<sup>c</sup> Includes consumption at coal gasification plants of 6.7 million tons for 1988. Syntfuels plant consumption is assumed to be 1.7 million tons per quarter in 1989 and 1990.

<sup>d</sup> Historical period discrepancy reflects an unaccounted 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*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); and *Quarterly Coal Report*, DOE/EIA-0121(89/1Q).

**Table 16. Supply and Disposition of Electricity**  
(Billion Kilowatthours)

Supply and Disposition	1988				1989				1990				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1988	1989	1990
<b>Net Utility Generation</b>															
Coal .....	<b>383.6</b>	<b>356.0</b>	<b>420.5</b>	<b>378.2</b>	<b>388.4</b>	<i>371.8</i>	<i>411.8</i>	<i>383.6</i>	<i>389.8</i>	<i>378.4</i>	<i>424.4</i>	<i>393.1</i>	<b>1538.2</b>	<i>1555.6</i>	<i>1585.7</i>
Petroleum .....	<b>37.6</b>	<b>24.4</b>	<b>40.1</b>	<b>46.6</b>	<b>49.4</b>	<i>30.3</i>	<i>32.1</i>	<i>32.0</i>	<i>28.0</i>	<i>28.0</i>	<i>33.2</i>	<i>32.7</i>	<b>148.8</b>	<i>143.9</i>	<i>121.9</i>
Natural Gas .....	<b>52.5</b>	<b>69.2</b>	<b>86.2</b>	<b>44.9</b>	<b>50.3</b>	<i>69.7</i>	<i>80.1</i>	<i>56.0</i>	<i>55.3</i>	<i>66.2</i>	<i>83.5</i>	<i>56.6</i>	<b>252.8</b>	<i>256.2</i>	<i>261.5</i>
Nuclear Power .....	<b>130.8</b>	<b>124.8</b>	<b>145.1</b>	<b>126.2</b>	<b>124.7</b>	<i>118.8</i>	<i>147.3</i>	<i>130.9</i>	<i>139.9</i>	<i>128.8</i>	<i>144.9</i>	<i>134.6</i>	<b>526.9</b>	<i>521.6</i>	<i>548.2</i>
Hydropower .....	<b>60.7</b>	<b>59.2</b>	<b>49.6</b>	<b>53.5</b>	<b>61.2</b>	<i>76.7</i>	<i>66.8</i>	<i>68.2</i>	<i>77.3</i>	<i>78.3</i>	<i>64.7</i>	<i>66.4</i>	<b>222.9</b>	<i>273.0</i>	<i>286.7</i>
Geothermal Power and Other <sup>a</sup> .....	<b>3.0</b>	<b>2.9</b>	<b>3.1</b>	<b>3.0</b>	<b>2.8</b>	<i>2.9</i>	<i>3.2</i>	<i>3.2</i>	<i>3.1</i>	<i>3.1</i>	<i>3.3</i>	<i>3.3</i>	<b>12.0</b>	<i>12.0</i>	<i>12.8</i>
<b>Total Utility Generation</b> .....	<b>668.1</b>	<b>636.5</b>	<b>744.7</b>	<b>652.3</b>	<b>676.8</b>	<i>670.2</i>	<i>741.4</i>	<i>673.9</i>	<i>683.4</i>	<i>682.7</i>	<i>754.0</i>	<i>686.8</i>	<b>2701.6</b>	<i>2762.3</i>	<i>2816.9</i>
<b>Net Imports</b> .....	<b>9.6</b>	<b>7.3</b>	<b>9.5</b>	<b>5.4</b>	<b>3.5</b>	<i>6.0</i>	<i>7.7</i>	<i>7.1</i>	<i>9.7</i>	<i>9.1</i>	<i>11.6</i>	<i>10.8</i>	<b>31.8</b>	<i>24.3</i>	<i>41.1</i>
<b>Purchases from Nonutilities</b> <sup>b</sup> .....	<b>14.7</b>	<b>14.0</b>	<b>15.5</b>	<b>14.2</b>	<b>17.1</b>	<i>16.6</i>	<i>18.2</i>	<i>16.6</i>	<i>19.6</i>	<i>19.0</i>	<i>20.9</i>	<i>19.1</i>	<b>58.4</b>	<i>68.5</i>	<i>78.6</i>
<b>Total Supply</b> .....	<b>692.4</b>	<b>657.9</b>	<b>769.7</b>	<b>671.8</b>	<b>697.4</b>	<i>692.9</i>	<i>767.2</i>	<i>697.6</i>	<i>722.6</i>	<i>710.9</i>	<i>786.5</i>	<i>716.7</i>	<b>2791.8</b>	<i>2855.1</i>	<i>2936.6</i>
<b>Losses and Unaccounted For</b> <sup>c</sup> .....	<b>48.2</b>	<b>63.6</b>	<b>60.3</b>	<b>53.4</b>	<b>43.4</b>	<i>68.3</i>	<i>59.4</i>	<i>59.3</i>	<i>43.6</i>	<i>68.3</i>	<i>60.9</i>	<i>60.9</i>	<b>225.6</b>	<i>230.4</i>	<i>233.7</i>
<b>Utility Sales</b> .....	<b>644.2</b>	<b>594.2</b>	<b>709.4</b>	<b>618.4</b>	<b>654.0</b>	<i>624.5</i>	<i>707.8</i>	<i>638.3</i>	<i>679.0</i>	<i>642.6</i>	<i>725.6</i>	<i>655.7</i>	<b>2566.2</b>	<i>2624.6</i>	<i>2702.9</i>

<sup>a</sup> Includes wind, wood, waste, photovoltaic, and solar.

<sup>b</sup> Electricity received from nonutility sources, including cogenerators and small power producers.

<sup>c</sup> Balancing item, mainly transmission and distribution losses.

Notes: Values for purchases from nonutilities and losses and unaccounted for are estimated for 1988. Minor discrepancies with other EIA published historic data are due to rounding. Historical values are printed in **boldface**, forecasts in *italics*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/04); and *Electric Power Monthly*, DOE/EIA-0226(89/04).