

SHORT-TERM --- ENERGY OUTLOOK

Q U A R T E R L Y P R O J E C T I O N S

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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. Table 7 summarizes the petroleum sensitivity cases and indicates the separate contributions to the alternative cases of price, macroeconomic conditions, and weather.

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

Relatively weak but positive growth in domestic petroleum demand is expected for 1990, following what could be the first annual decline in oil demand since 1983. The year 1989 is now expected to finish up with a 0.2-percent decline in oil demand, with 0.9 percent growth expected next year. Stable oil prices, a slowing economy, and greater availability of nuclear and hydroelectric power sources all play significant roles in this outlook. On the supply side, domestic oil production is expected to continue to decline significantly. Aggregate crude oil production is expected to fall by 3.9 percent next year, following an average decline of 5.8 percent this year (Table 1).

Imported Crude Oil Prices Should Remain at About \$17.50 Through 1990

Imported crude oil prices eased from the April peak of \$19.60 per barrel to near \$18.00 by mid-summer. Presently, oil prices are expected to remain at \$17.50 per barrel. Recent developments now suggest that OPEC may have to restrain crude oil production by more than 1.0 million barrels per day between the fourth quarter of this year and early 1990 to maintain oil prices at \$17.50 throughout the forecast period.

Mild Weather, Weak Residual Fuel Oil Sales Depress Oil Use

A 70,000 barrels per day slide in residual fuel demand and low heating fuel demand for all of 1989 are expected to contribute to a 30,000-barrel-per-day net decline in domestic oil use from 1988 to 1989.

Heating Oil Demand to Lead Distillate Growth

Sharply higher heating oil demand expected for the first quarter of 1990 (expected if weather is normal) will contrast with last year's depressed levels. (See "Winter Distillate Outlook.") Otherwise, overall distillate growth next year should be minimal.

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 was already evident by early summer. In 1989, total U.S. production is expected to decline by 470,000 barrels per day from a year earlier—a 5.8-percent drop. In 1990, total oil production is projected to drop by an additional 300,000 barrels per day, as Lower-48 and Alaskan supplies continue to decline. This assumes that new production coming on-line from offshore California (Point Arguello) will not begin until the second quarter of 1990.

Net Oil Imports to Increase by 600,000 Barrels per Day in 1989

U.S. net imports of crude oil (including the Strategic Petroleum Reserve) and petroleum products are expected to average 7.2 million barrels per day in 1989, with an increase of 600,000 barrels per day over 1988 levels expected. This reflects the impact of reduced domestic production and additions to petroleum stocks following a drawdown in 1988.

Electricity Demand Moderates

Electricity sales are projected to increase by 1.8 percent in 1989 and by 3.0 percent in 1990. A particularly cool summer in many regions has led to an estimated decline in sales in the third quarter of 1989.

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
Macroeconomic Indicators							
Real Gross National Product (billion 1982 dollars)	3,854	4,024	<i>4,139</i>	<i>4,214</i>	4.4	<i>2.9</i>	<i>1.8</i>
Index of Industrial Production (Mfg.) (index, 1977 = 1.000)	1.346	1.427	<i>1.474</i>	<i>1.492</i>	6.0	<i>3.3</i>	<i>1.2</i>
Imported Crude Oil Price (nominal dollars per barrel)	18.13	14.64	<i>17.70</i>	<i>17.50</i>	-19.2	<i>20.9</i>	<i>-1.1</i>
Retail Prices (nominal) ^a							
Motor Gasoline ^b (dollars per gallon)96	.96	<i>1.06</i>	<i>1.09</i>	.0	<i>10.4</i>	<i>2.8</i>
No. 2 Heating Oil (dollars per gallon)80	.81	<i>.86</i>	<i>.88</i>	1.3	<i>6.2</i>	<i>2.3</i>
Residential Natural Gas (dollars per thousand cubic feet)	5.54	5.47	<i>5.66</i>	<i>5.81</i>	-1.3	<i>3.5</i>	<i>2.7</i>
Residential Electricity (cents per kilowatthour)	7.41	7.49	<i>7.65</i>	<i>7.88</i>	1.1	<i>2.1</i>	<i>3.0</i>
Petroleum Supply							
Crude Oil Production ^c (million barrels per day)	8.35	8.14	<i>7.67</i>	<i>7.37</i>	-2.5	<i>-5.8</i>	<i>-3.9</i>
Net Petroleum Imports, Including SPR (million barrels per day)	5.91	6.59	<i>7.19</i>	<i>7.61</i>	11.5	<i>9.1</i>	<i>5.8</i>
Energy Demands							
Total Market Economies Petroleum (million barrels per day)	49.15	50.74	<i>51.94</i>	<i>53.03</i>	3.2	<i>2.4</i>	<i>2.1</i>
Total U.S. Petroleum Consumption (million barrels per day)	16.67	17.28	<i>17.25</i>	<i>17.41</i>	3.7	<i>-2</i>	<i>.9</i>
Motor Gasoline	7.21	7.34	<i>7.34</i>	<i>7.41</i>	1.8	<i>.0</i>	<i>1.0</i>
Jet Fuel	1.38	1.45	<i>1.48</i>	<i>1.50</i>	5.1	<i>2.1</i>	<i>1.4</i>
Distillate Fuel Oil	2.98	3.12	<i>3.12</i>	<i>3.17</i>	4.7	<i>.0</i>	<i>1.6</i>
Residual Fuel Oil	1.26	1.38	<i>1.31</i>	<i>1.19</i>	9.5	<i>-5.1</i>	<i>-9.2</i>
Other Petroleum ^d	3.83	4.00	<i>4.00</i>	<i>4.14</i>	4.4	<i>.0</i>	<i>3.5</i>
Natural Gas Consumption (trillion cubic feet)	17.21	18.03	<i>18.34</i>	<i>18.66</i>	4.8	<i>1.7</i>	<i>1.7</i>
Coal Consumption (million short tons)	837	883	<i>884</i>	<i>893</i>	5.5	<i>.1</i>	<i>1.0</i>
Electricity Sales (billion kilowatthours)	2,455.4	2,566.2	<i>2,611.6</i>	<i>2,689.0</i>	4.5	<i>1.8</i>	<i>3.0</i>
Gross Energy Consumption ^e (quadrillion Btu)	76.84	80.23	<i>80.79</i>	<i>82.20</i>	4.4	<i>.7</i>	<i>1.7</i>
Thousand Btu/1982 Dollar of GNP	19.94	19.94	<i>19.52</i>	<i>19.51</i>	.0	<i>-2.1</i>	<i>-1</i>

^a All prices include taxes, except prices for No. 2 heating oil and residential electricity.

^b Average for all grades and services.

^c Includes lease condensate.

^d 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.

^e 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(89/07); *International Energy Annual 1987* DOE/EIA-0219(87); *Petroleum Marketing Monthly*, DOE/EIA-0380(89/07); *Petroleum Supply Monthly*, DOE/EIA-0109(89/08); *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Natural Gas Monthly*, DOE/EIA-0130(89/07); *Electric Power Monthly*, DOE/EIA-0226(89/07); and *Quarterly Coal Report*, DOE/EIA-0121(89/2Q); Organization for Economic Cooperation and Development, Monthly Oil Statistics Database through March 1989. Macroeconomic projections are based on modifications to Data Resources, Inc., Forecast CONTROL989.

Assumptions

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

International Petroleum

Recent Developments

In late July, the spot prices of OPEC crude oils began to weaken, declining by August 11 to a range of about \$13.00 to \$16.50 per barrel, the lowest range of prices experienced since January 13, 1989. Predictions that increasing OPEC production would force prices still lower proved incorrect, however, as prices turned upward. By September 22, one day before the OPEC Oil Ministers convened in Geneva, prices ranged from \$15.00 to \$18.00 per barrel.¹ At the same time, market analysts were in general agreement that the world oil market was relatively well-balanced, even though OPEC crude oil production was averaging at least 22.0 million barrels per day.

The forecast detailed in the next two sections, prepared before the Geneva deliberations began, is based on the assumption that OPEC crude oil production will be held roughly in line with perceived demand throughout the forecast period. Given that assumption, world oil prices could be expected to remain near current levels through 1990. However, the results of the deliberations in Geneva suggest that OPEC may be unable to exert sufficient production restraint to maintain prices at current levels, particularly in the first half of 1990. Thus, a distinct downward risk to the oil price forecast should be emphasized.

Downside Oil Price Risk Explained

Even before OPEC convened in Geneva, it was already clear that much more OPEC production discipline will be required in 1990 than in 1989. This year, a higher-than-expected increase in oil consumption and an absolute decline in non-OPEC oil production will have allowed OPEC producers to increase their oil production by close to 2 million barrels per day over the rate for 1988, while, at the same time, receiving significantly higher average prices (Tables 1 and 2). In 1990, by contrast, the growth in oil consumption is expected to slow and non-OPEC oil production is expected to increase significantly. As a result, OPEC may have to hold its total oil production in 1990 to about 23.7 million barrels per day (including about 2.0 million barrels per day of condensate, liquefied petroleum gas, and refinery gain—see Table 2, footnote a), or only 240,000 barrels per day more than the average projected for 1989, just to maintain current price levels. This constraint alone could prove very difficult to attain because Iraq will probably want to increase its production by at least 500,000 barrels per day in 1990, as it takes advantage of its expanded export capacity in the Red Sea and in the Persian Gulf.

Adding to the pressure on OPEC, the requirement for them to restrain production is projected to be even greater in the first half of 1990. In order to maintain current price levels, it is projected that OPEC will have to reduce its crude oil production in the first half of 1990 by well over 1.0 million barrels per day below the rate projected for the fourth quarter of 1989, or to about 21.0 million barrels per day (which implies about 23.1 million barrels per day of total oil).

When the OPEC Oil Ministers met in Geneva, they were presented with a similar set of projections for 1990 from the OPEC Secretariat. After 5 days of intense deliberations, all that they could agree on was to increase their crude oil production ceiling for the fourth quarter of 1989 by 1.0 million barrels per day to 20.5 million barrels per day, with the increase allocated among member nations on a pro rata basis. Kuwait and the United Arab Emirates (UAE), who have both been demanding disproportionately larger quota shares, each rejected their new quotas and Algeria disassociated itself from the agreement. As a result, no tightening in OPEC production discipline can be expected in the fourth quarter and production may actually increase above current levels. This lack of discipline may put downward pressure on world oil prices in the fourth quarter, if OPEC crude oil production is seen to be exceeding the generally perceived demand for OPEC crude oil of about 22.5 million barrels per day.

The most important result of the Geneva deliberations was that the Oil Ministers were unable to reach agreement on an Iranian proposal that would have reduced quota violations, while at the same time increasing the actual production quotas of all member nations in 1990. Iran proposed: (1) that the crude oil production ceiling be increased by 2.0 million barrels per day to 21.5 million barrels per day; (2) that larger shares of the increase be allocated to both Kuwait and the UAE, as well as to Ecuador and Gabon; (3) that the shares of Iran, Iraq, and Saudi Arabia be unchanged; and (4) that the shares of the other six members be reduced. The proposal was rejected by Libya and the UAE, basically because their proposed quotas were not large enough, while other members were broadly in favor.

The rejection of the Iranian proposal strongly suggests that it will be very difficult for the OPEC member nations to restrict their crude oil production to a rate of 21.5 million barrels per day or less during 1990. This suggests that there could be some downward pressure on world oil prices in 1990, particularly in the first half of the year, when the call on OPEC crude oil is only projected to be about 21.0 million barrels per day.

Forecast

The demand for petroleum products by the Market Economies is expected to average over 51.9 million barrels per day in 1989, an increase of 1.20 million barrels per day, or 2.4 percent, from the 1988 rate (Table 2). The 1989 rate would be only 310,000 barrels per day below the record high rate of demand set in 1979. In 1990, demand is expected to increase by 1.09 million barrels per day, or 2.1 percent.

Petroleum demand by the OECD countries is expected to average about 37.5 million barrels per day in 1989, an increase of 540,000 barrels per day, or 1.5 percent, from the rate for 1988. This increase is based on the assumption that the OECD economies will grow at a 3.3-percent rate in 1989 (Table 3). Japan is expected to account for over one-half of the demand increase, while Europe should account for one-third. In 1990, as OECD economic growth slows to 2.6 percent, OECD petroleum demand is expected to increase by 530,000 barrels per day, or 1.4 percent. Japan and Europe together are expected to account for about two-thirds of the demand increase in 1990, while the United States accounts for 30 percent.

Petroleum demand in the Other Market Economies, or developing countries, is expected to continue to grow rapidly in both 1989 and 1990 and should account for over 50 percent of the growth in demand by the Market Economies in both years. In 1989, petroleum demand by the Other Market Economies is expected to average almost 14.5 million barrels per day, an increase of 660,000 barrels per day, or 4.8 percent, from the rate for 1988; in 1990, petroleum demand is expected to increase by 560,000 barrels per day, or 3.9 percent. About three-fourths of the increase in demand by the developing countries in both 1989 and 1990 is expected to occur in the non-OPEC developing countries, especially in South Korea, Taiwan, Thailand, and India.

Oil production from the non-OPEC Market Economies is expected to decline by about 360,000 barrels per day in 1989, and then increase by about 650,000 barrels per day in 1990. In 1989, significant production declines from the United States (500,000 barrels per day) and the United Kingdom (425,000 barrels per day) will more than offset increases from Norway (390,000 barrels per day) and Brazil (45,000 barrels per day). In 1990, expected production increases from the United Kingdom (315,000 barrels per day), Norway (160,000 barrels per day), and Brazil (100,000 barrels per day) will more than offset declines from the United States (260,000 barrels per day) and Mexico (45,000 barrels per day).

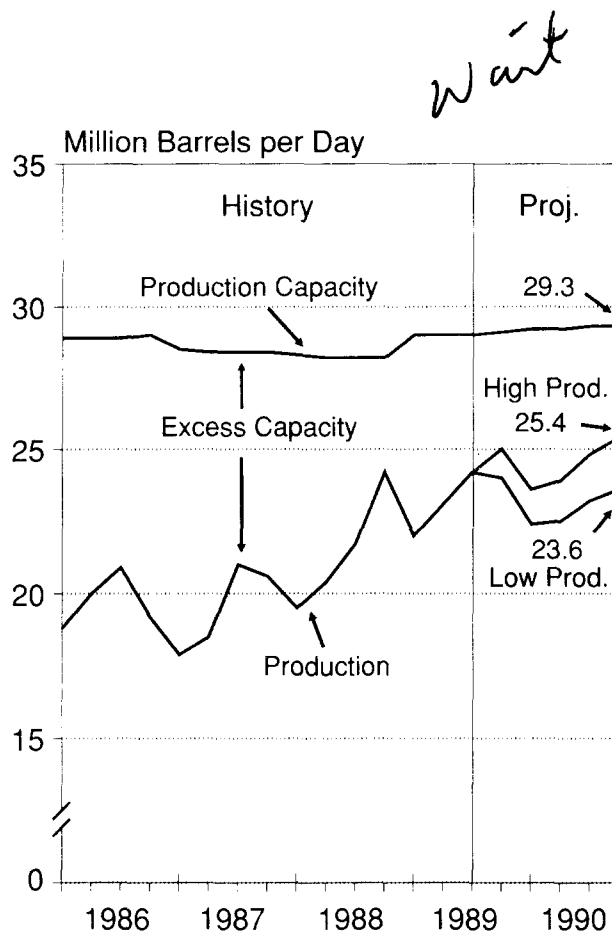


Figure 1. OPEC Oil Production and Production Capacity

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.

✓ see next

The forecast detailed above implies OPEC production in 1989 of over 23.4 million barrels per day, or 1.96 million barrels per day above the average rate for 1988 (Figure 1). In 1990, OPEC production will probably continue to increase, especially if Iraq chooses to use its expanded export capacity. A range of possible aggregate OPEC oil production levels is projected, based on a range 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 this *Outlook*, a relatively high probability is assigned to the low price scenario, as explained in "Recent Developments" above.

In the base oil price scenario, the world oil price decreases from \$17.60 in the third quarter of 1989 to \$17.50 in the fourth quarter of 1989 and throughout 1990. This scenario is based on the assumption that OPEC will be able to agree at the November Ministerial Conference on a new set of crude oil production quotas that will restrain total OPEC crude oil production (1) to about 21.0 million barrels per day in the first half of 1990 and (2) to an annual average rate of about 21.7 million barrels per day for 1990.

In the low oil price scenario, the world oil price decreases to \$15.00 per barrel in the fourth quarter of 1989 and remains at that level throughout the forecast period. In this scenario, it is assumed that the battle for market share between the Persian Gulf members of OPEC will intensify and lead to higher OPEC oil production than in the base scenario. 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 fourth 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 in late 1989 and in 1990, and that OPEC will reach a solid production accord that will sharply reduce the incentive for Persian Gulf member nations to engage in overproduction.

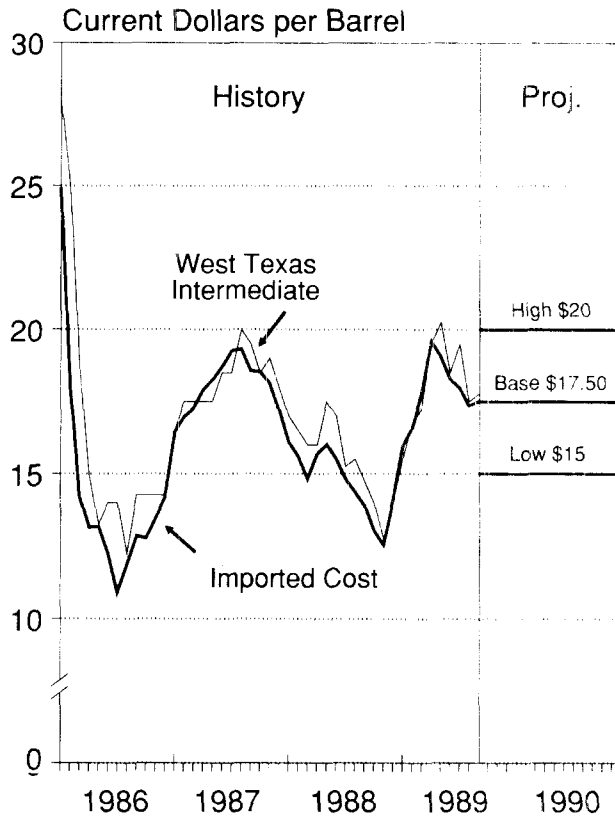


Figure 2. World Oil Prices

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(89/07) (Washington, DC, 1989); and *Oil and Gas Journal Energy Database* (Tulsa, OK, October 1989). **Projections:** Table 4.

Energy Product Prices

Only small upward movements in energy product prices between 1989 and 1990 are expected on an annual basis, largely reflecting the outlook for stable crude oil prices (Table 5). Energy prices are not expected to be affected by the ongoing coal strike in the Appalachian region. However, the recent refinery shutdown in St. Croix, VI, caused by Hurricane Hugo in September has already caused short-lived upward movements in prices of refined petroleum products.

Gasoline Prices Peak Earlier than Usual This Year; Only Slight Rise Expected for Next Year

The retail price of motor gasoline jumped by \$0.17 per gallon, between the first and second quarters of the year. This increase (Figure 3) was the largest quarter-to-quarter price increase for gasoline on record in the United States, surpassing the increase of \$0.15 per gallon between the fourth quarter of 1979 and the first quarter of 1980, during the Iranian revolution. The magnitude of this increase in gasoline prices resulted from an earlier increase in crude oil prices. Factors that contributed directly or indirectly to the timing of this increase included high refinery utilization rates, added costs to refiners to reduce vapor emissions, and seasonal demand for gasoline. By May, the price had peaked at \$1.15 per gallon. During the summer, the price actually fell to less than \$1.10 per gallon by August, the month that historically registers the highest price for the year. This counter-cyclical decrease reflected lower crude oil prices, very high refinery production levels, consumer resistance in purchasing the more expensive premium blends, and an overall moderate demand for the fuel.

Following Hurricane Hugo's damage to the Amerada Hess refinery in St. Croix, an unusual price spike of more than 5 cents per gallon was briefly observed on the wholesale spot market. However, spot prices of gasoline returned to below pre-Hugo levels by October 1989. Prior to the storm, this facility, with a capacity of 545,000 barrels per day,² was yielding about 100,000 barrels of gasoline per day. Downtime has been estimated to be between 30 and 60 days. Thus, any further resulting price increase due to the damage should be short-lived. On September 16, most States suspended the motor gasoline volatility standards for the winter, reducing production costs for gasoline. But any decrease in the average cost of gasoline that is passed on to the pump, may be offset by a return of increased consumer purchases of the higher and costlier octane blends. In 1990, the price is expected to increase by an average of \$0.03 per gallon (a decrease in inflation-adjusted terms), with some of this increase due to the lagged adjustment of gasoline margins to increases in crude oil prices in 1989. The remainder of this expected increase will be the result of rising State and local taxes.

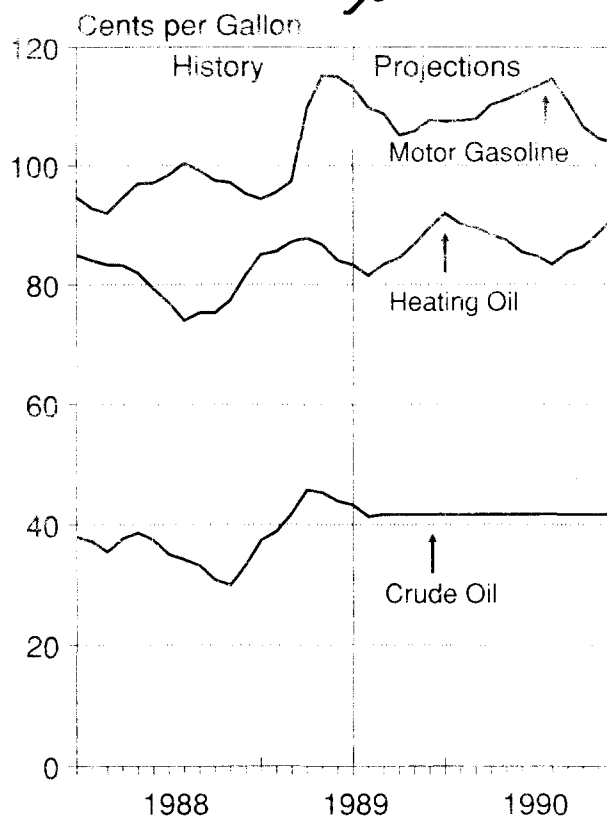


Figure 3. Crude Oil and Retail Product Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/07) (Washington, DC, 1989).
Projections: Table 5.

Well

Natural Gas Prices Uncertain as Appeals Court Vacates FERC Order 451

In the forecast period, natural gas prices at the wellhead are expected to grow at about the rate of inflation as supplies are getting somewhat tighter (Figure 5). But flat oil prices should cap any large natural gas price increases.

On September 15, 1989, the Fifth Circuit Court of Appeals in New Orleans vacated Federal Energy Regulatory Commission (FERC) Order 451. Order 451 allowed all categories of "old" gas to receive the highest price ceiling available to any gas produced under this category. This price ceiling, now \$2.88 per million Btu, is significantly above current market prices. Gas prices to producers for this gas were renegotiated upward as a result. The Court ruled that FERC exceeded its authority under the 1978 Natural Gas Policy Act by combining several categories of old gas at a single, higher rate. The result of this ruling was generally hailed by pipeline companies, but denounced by some producers who may have to refund money to the pipelines and revert to contractual arrangements terminated under provisions of the order. However, this ruling may be stayed or appealed in the judicial process. The net result of this ruling to the end user, if upheld, is uncertain, since the benefits to the pipeline operators could simply offset the loss to the producers.

Heating Oil Prices to Increase this Fall

Residential heating oil prices are expected to be especially affected by the refinery damages in St. Croix. This refinery produces twice as much heating oil as gasoline, and the damage came at a time of inventory buildup for heating oil. About 50,000 barrels per day from St. Croix was exported to the Eastern States in 1988, where much of the nation's heating oil is consumed.⁴ Also, heating oil demand in 1988 was strong in Europe, particularly in West Germany. Thus, imports from Europe may be down this year. Finally, as of the end of September, stock levels are about 10 million barrels lower than in the previous September, equivalent to about a 5-percent reduction of day's supply compared to last year. The combination of these events may result in an additional increase in price between \$0.01 and \$0.02 per gallon above the normal seasonal increase for the fourth quarter of this year. If temperatures are severely cold this winter, the price rise could be exacerbated, particularly on the East Coast. However, mild winter temperatures and low world oil prices could have the reverse effect. In 1990, heating oil prices are expected to increase by about \$0.02 per gallon over 1989 prices, primarily reflecting the projected difference of \$0.05 per gallon between the unseasonably low prices in first quarter of 1989 and the more normal first quarter of 1990 (Table 5).

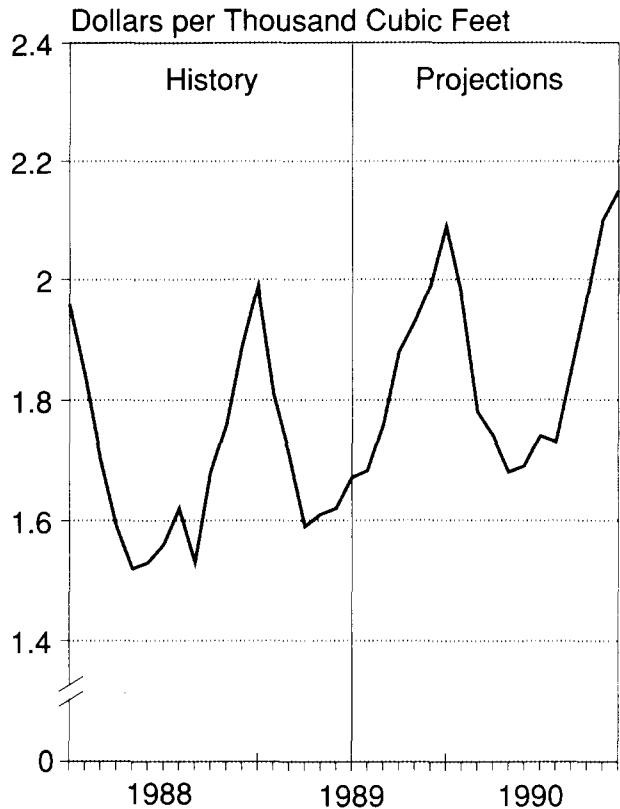


Figure 5. Natural Gas Wellhead Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/07) (Washington, DC, 1989). **Projections:** Table 5.

Macroeconomic Activity

Based on projections from Data Resources, Inc., adjusted for EIA's world oil price estimates, real gross national product (GNP) is expected to increase by 2.9 percent this year, reflecting a reduction in growth from the relatively large growth of 4.4 percent in 1988.⁵ GNP growth is expected to continue to decelerate in 1990 to 1.8 percent, reflecting a leveling of growth in consumption, investment, and exports (Table 4).

Slower growth in consumption, investment, and the trade sectors is the primary reason for the somewhat slower growth in GNP expected over the forecast period. Relatively high interest rates in 1988 and early 1989 contribute to less growth in residential fixed investment during the last half of 1989. However, construction should recover in the remaining 4 quarters of the forecast period. The foreign trade balance, a particularly strong stimulus to investment in producers' durable equipment, is projected to continue to improve, but less rapidly. As a result, non-residential fixed investment should experience slower growth over the forecast.

Consumption is expected to account for a larger proportion of real GNP change over the forecast period. In 1988, consumption contributed slightly over 49 percent of the GNP growth. For the forecast period, consumption expenditures explain over 60 percent of GNP, as the share of both government and the net trade balance decline. In 1990, the improvement in the residential fixed investment should cause investment's share of real GNP change to improve (Figure 6).

Real disposable income and manufacturing production over the forecast period are expected to follow the tendency of real GNP to grow at a slower pace (on an annual basis) than in 1988 (Figure 6).

Forecasting macroeconomic growth involves uncertainty about the magnitude of change of crucial economic variables affecting the macroeconomy. In addition, economic growth is a major determinant in explaining energy demand. As a result, the high and low world oil price cases incorporate a band of GNP growth, 1 percent above and below the base growth rate.

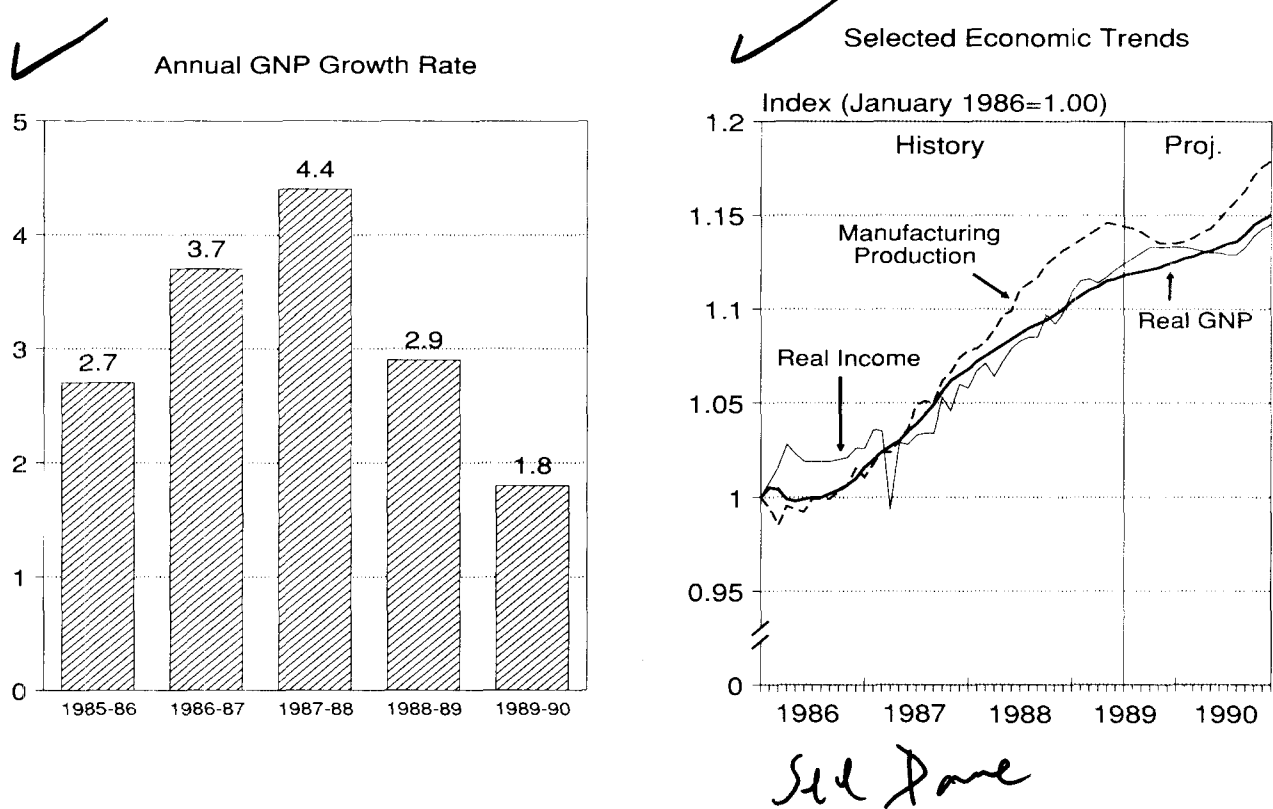


Figure 6. Key Economic Indicators

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

wait

Petroleum Demand

Overview

Petroleum demand is expected to average 30,000 barrels per day lower for all of 1989 than last year (Table 6 and Figure 7). This decline reflects the effects of a slowing domestic economy, temperatures which are milder than last year (either already experienced or assumed for the remainder of 1989), and price increases relative to 1988. The 1989 falloff is attributed to a leveling off of gasoline demand following a sharp price rise last spring and to projections of reduced heating fuel demand, which will almost certainly materialize if temperatures are normal or above normal this fall. Also, electric utility fuel oil use, while unusually strong through the second quarter of 1989, 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 1988.

An additional 160,000 barrels per day of petroleum demand is expected in 1990, mainly because of an expected rebound in heating fuel oil demand next winter and 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 1.2 percent (Table 4).

The Fourth-Quarter Weakness

Even though petroleum demand is expected to rise during 1990, fourth-quarter 1989 demand is projected to decline by 170,000 barrels per day—or 1.0 percent—from the level of the fourth quarter of 1988. Three factors account for much of this weakness.

First, low oil prices stimulated oil demand by 3.7 percent last year. In the fourth quarter of 1988, crude oil prices averaged \$13.21, or almost 25 percent less than the \$17.50 average assumed for the current quarter. Natural gas prices to markets in the industrial and electric utility sectors in the current quarter, however, are projected to be similar to those of the fourth quarter of 1988. Gas prices to electric utilities were slightly higher than residual fuel oil in the fall of 1988; they are projected to be 13 percent lower than heavy oil this fall (Table 5). Therefore, natural gas is expected to displace substantial amounts of oil this winter.

Second, the weather in terms of heating degree-days was more than 4 percent colder than normal in the fourth quarter of 1988 (Table 4), boosting consumption of residual fuel oil by the electric utility and the commercial sectors, and stimulating distillate (and propane) consumption by residential customers. As the forecast assumes normal weather patterns for the current quarter, heating oil consumption is expected to fall slightly from that of the previous year (when weather averaged colder than normal), and demand for residual fuel oil in the electric utility and commercial sectors is expected to decline substantially.

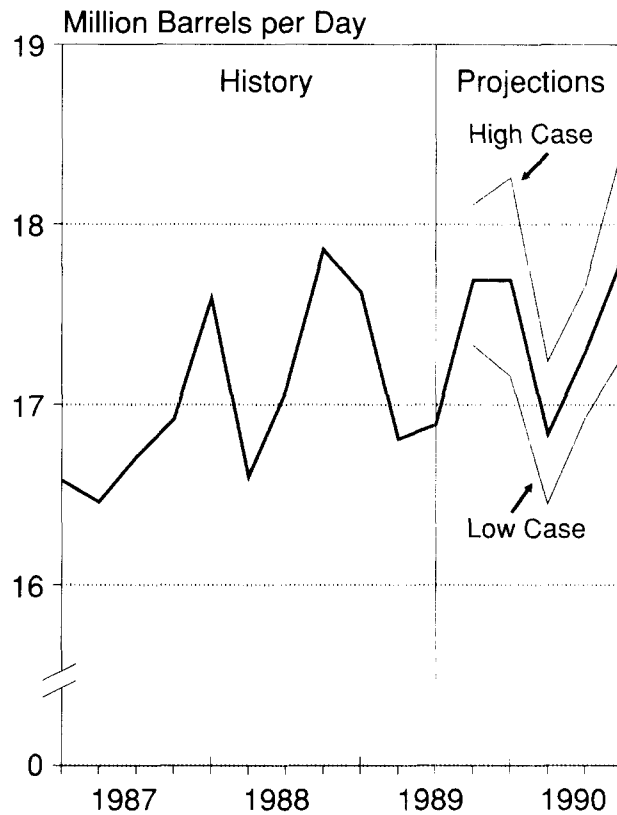


Figure 7. Total Petroleum Demand

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(89/08) (Washington, DC, 1989). **Projections:** Tables 6, 8, and 9.

Third, industrial output in the current quarter is projected to rise only slightly from 1988 levels, contrasting sharply with the brisk, 5- to 6-percent increases observed for all of 1988. As a result, residual fuel oil consumption, already under pressure from more competitive natural gas, is expected to decline even further as a result of the slowdown in economic growth.

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. For the current *Outlook*, about 9 percent of the overall difference in petroleum demand cases is explained by oil price variation, 53 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 18,000 barrels per day;
- For every 1 percentage point of additional growth in real GNP, petroleum demand can be expected to increase by about 124,000 barrels per day;
- For every 1 percent increase of cooling degree-days over normal levels, petroleum demand is expected to increase by 0.03 percent; for heating degree-days, petroleum demand is expected to increase by 0.09 percent.

Petroleum Supply

In 1989 and 1990, domestic oil production is projected to decline at somewhat faster rates than in 1988 (Table 6). As a result, the dependency on imported sources of oil is expected to increase at rates similar to those of recent years, despite the almost flat petroleum product demand growth.

Projections for the fourth quarter of 1989 suggest that a further steady decline in domestic production from the fourth quarter of 1988 will contribute to an increase in the dependency on net imports from 39 to 41 percent of demand over this same period (Figure 8 and Table 6). This is an apparent slowdown in the rate of increase in the relative share of imports. That moderation is largely attributed to the decline of 170,000 barrels per day in petroleum demand over that same period. (See "Petroleum Demand.") In addition, year-to-year changes in fourth-quarter weather patterns as well as the underlying change in economic conditions are projected to result in a fourth-quarter product stock drawdown less than that for the same quarter in 1988.

The projected year-to-year increase in fourth-quarter refinery activity is expected to result in an increase of 120,000 barrels per day in refinery output of distillate during that period (Table 11). In addition, distillate demand is projected to decline by 20,000 barrels per day, or 0.6 percent, from the level of the fourth quarter of 1988 (Table 6). Largely as a result of these two factors, primary distillate stocks are projected to register an increase during this fourth quarter, compared to the normal pattern of a sizeable drawdown.

Average domestic crude oil production for 1989 is projected to decline by 470,000 barrels per day, or 5.8 percent, from levels of 1988 and a further 300,000 barrels per day, or 3.9 percent, in 1990. The temporary effects of the Valdez oil spill and bad weather, as well as the natural decline rate, are expected to result in a decline of 150,000 barrels per day during 1989 in Alaskan crude oil production, accounting for about 32 percent of the decline in total domestic output. Lower-48 crude oil production in 1989 is projected to decline by 330,000 barrels per day, which is a somewhat faster pace than that of the previous year (Figure 9). Although crude oil prices managed to stage a recovery in the early part of the year, drilling activity, which typically responds to changes in oil prices with a lag of several months, continued to decline until the middle of the year. According to the Baker-Hughes rotary rig count, the number of active rigs fell from 841 at the beginning of the year to 754 in May, and has since recovered to 1010 by late October in response to the increase in crude oil prices.⁶ Nonetheless, the average rig count for 1989 is projected to be slightly less than that for 1988.

For 1989, total net imports of crude oil and petroleum products are projected to average 7.19 million barrels per day, or 42 percent of oil requirements, an increase of 600,000 barrels per day from the 1988 average (Figure 9). This increase reflects falling domestic oil production, and is predicated on plentiful import supplies.

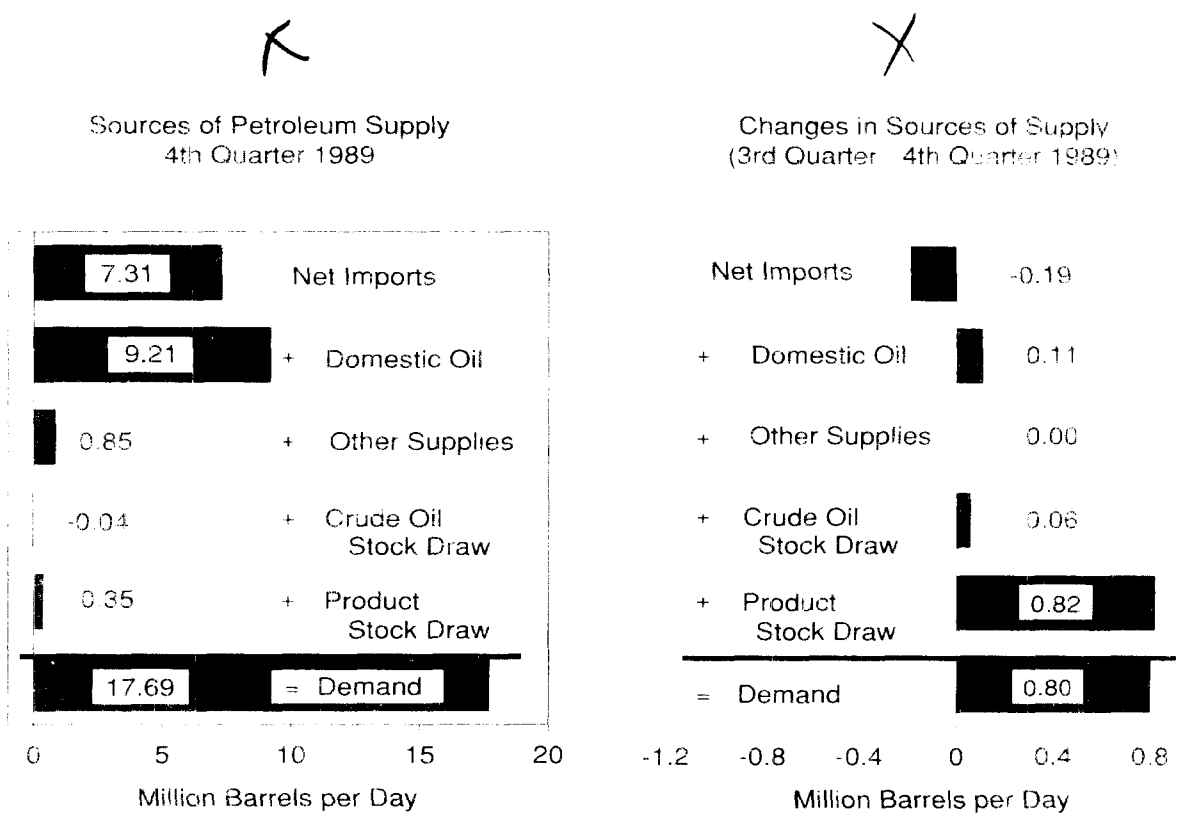


Figure 8. Sources of Petroleum Supply

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to August 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41) (Washington, DC).
Projections: Table 6.

In 1990, the decline in Alaskan crude oil production is projected to slow to 30,000 barrels per day, considerably below the decline rate of the previous year. This forecast assumes normal weather patterns, in contrast to the harsh climatic conditions that hampered production in the previous year; no repetition of spills that would disrupt production activity; and the implementation of enhanced recovery programs, such as increases in gas compression and gas handling facilities, which are expected to reduce the rate of decline in several North Slope fields. Lower-48 crude oil production in 1990 is projected to decline by 250,000 barrels per day, somewhat less than that of the previous year. Because of continued price stability, drilling activity is projected to be higher in 1990 than in 1989 and help to slow the decline rate in the Lower-48 States. In addition, the forecast also assumes that the new Point Arguello field comes on-stream during the second quarter of 1990, producing 25,000 to 30,000 barrels per day during the second half of the year.

Net imports are projected to increase by a further 420,000 barrels per day to an average of 7.61 million barrels per day, or 44 percent of domestic demand in 1990. Total petroleum inventories (excluding the SPR) are projected to register 1.05 billion barrels at the end of the year, the same as at the end of the previous year.

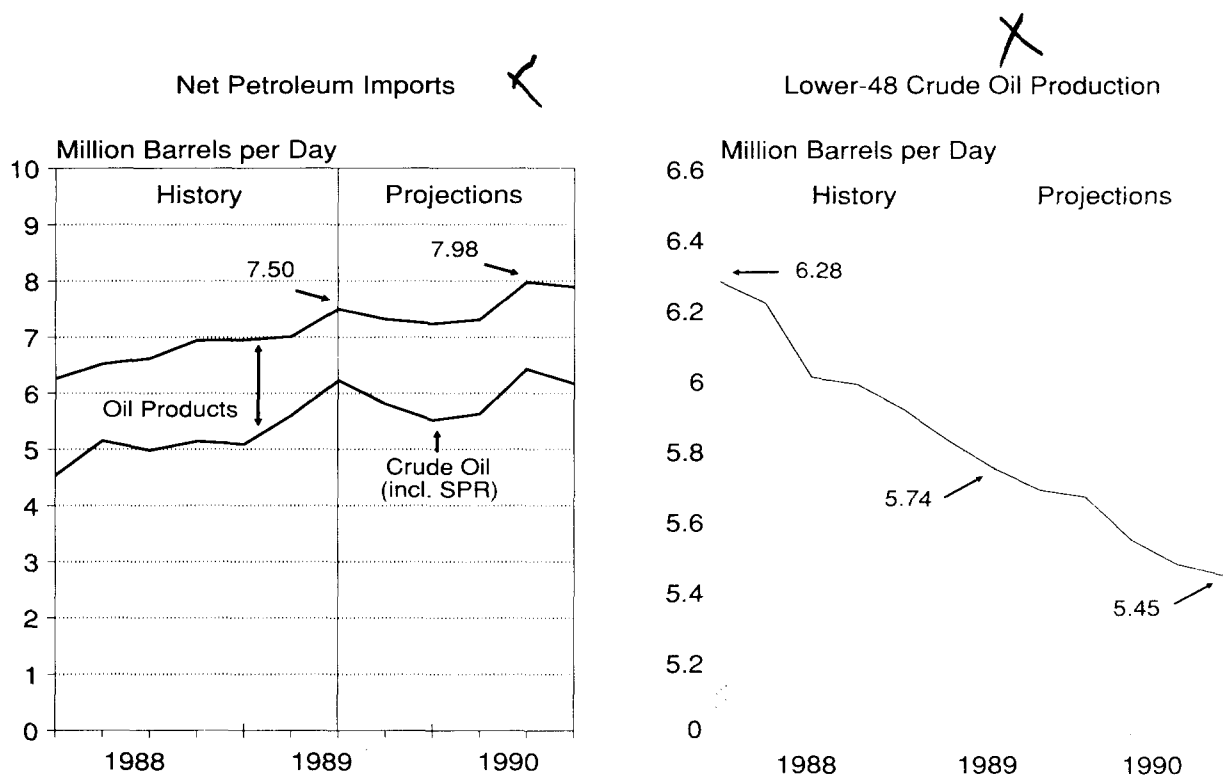


Figure 9. Petroleum Imports and Production

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 August 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41) (Washington, DC). **Projections:** Table 6.

Motor Gasoline

No growth in gasoline demand is expected for all of 1989, and 1990 is projected to bring growth of 1.0 percent, reflecting slower growth observed during the last 3 years. Presumably much of the 1989 slowdown can be traced to the sharp price rise in the second quarter, while the moderate growth in motor gasoline demand projected for 1990 is attributable to declining prices (in inflation adjusted terms) offsetting underlying economic weakness.

Motor gasoline product supplied in 1989 is projected to remain at the 1988 level (Table 10). Although the small increase in deliveries is surprising in view of the projected 3.2-percent increase in miles traveled, projected deliveries for the year may possibly understate actual consumption (Figure 10). Although drivers apparently moderated their discretionary travel during the summer season in reaction to the price hike, they also switched away from premium grade gasoline. Between March and July, the latest month for which estimates are available,⁷ premium's share of the gasoline market declined from 25 to 22 percent, reversing a long-standing upward trend. Mid-grade, the principal beneficiary of the price-induced change in consumer preference, increased its share from 5 to 7 percent during the same period. Unleaded regular gasoline benefited from both the continuing erosion of leaded regular's share of the market as well as the switch away from premium, rising from 57 to 61 percent.

In 1990, motor gasoline demand is projected to increase by 1.0 percent. Vehicle-miles traveled are projected to rise only 1.5 percent—less than half of the previous year's growth rate—largely as a result of moderation in the growth of real disposable income to only 1.1 percent. Two underlying factors are expected to contribute to slight growth in deliveries for the year. First, smaller increase in fuel efficiency for the automobile fleet is expected in 1990, in contrast to the increase expected for all of 1989 (Figure 10). This projection of fuel efficiency growth reflects the virtual lack of increase in fuel economy observed in new vehicles during the last several years. Since 1986, new-model-year fuel economy for all light-duty

See Mike Morris ✓

See Mike Morris ✓

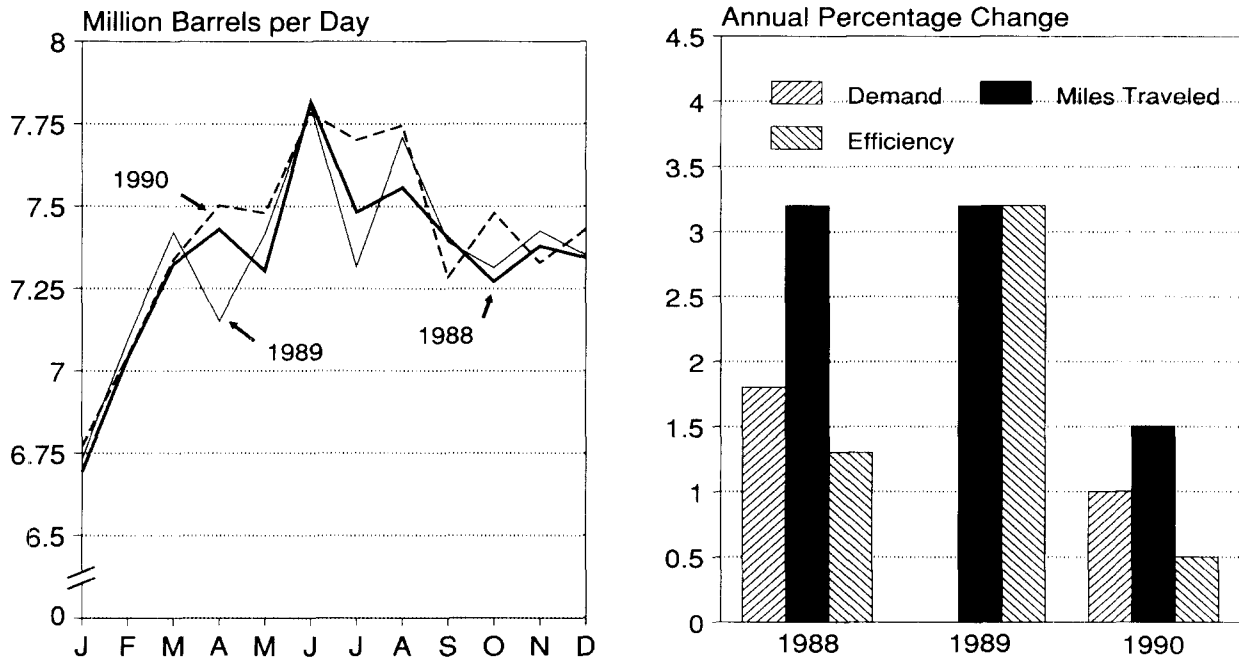


Figure 10. Motor Gasoline Demand and Components

Note: Projections begin in the fourth quarter of 1989.
 Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(89/08) (Washington, DC, 1989); and U.S. Department of Transportation, Federal Highway Administration, *Traffic Volume Report* (Washington, DC). **Projections:** Table 10.

vehicles, has actually declined slightly.⁸ Second, retail gasoline prices, after adjusting for inflation, are projected to decline by 1.3 percent, giving a slight boost to travel activity.

Distillate Fuel Oil

Moderate growth in distillate demand is expected in the last half of 1989, with demand for the year finishing even with the level of a year earlier (Table 11 and Figure 11). However, distillate demand in the fourth quarter is projected to decline by about 20,000 barrels per day, or 0.6 percent, compared with the relatively cold fourth quarter of 1988. Growth in industrial activity, which has been providing impetus to the demand for diesel fuel in the transportation sector, is not expected to maintain nearly the pace seen in 1988 and in early 1989 (Table 4). Furthermore, higher prices of distillate may dampen some discretionary demand (Table 5). Demand in 1990 is projected to grow at a rate of 1.6 percent on an annual basis. Weather conditions add to year-over-year increases in heating oil demand in the first quarter. (See "Winter Distillate Outlook.")

Demand for distillate in the transportation sector exhibited unusually strong growth from 1987 to 1988, increasing by 8.6 percent (Figure 11). Increased highway freight traffic over the same period has been closely connected to the growth in manufacturing activity (up 6.0 percent last year). Highway diesel use constitutes over 75 percent of distillate demand in the transportation sector, and accounted for the bulk of this increase. However, the railroad and vessel bunkering components of demand also grew substantially. Somewhat surprisingly, even with the rapid growth in industrial production, a reported drop in industrial use of distillate fuel oil occurred from 1987 through 1988. Demand growth in 1988 in the residential sector was offset by a drop in demand for some uses of distillate in the commercial sector.

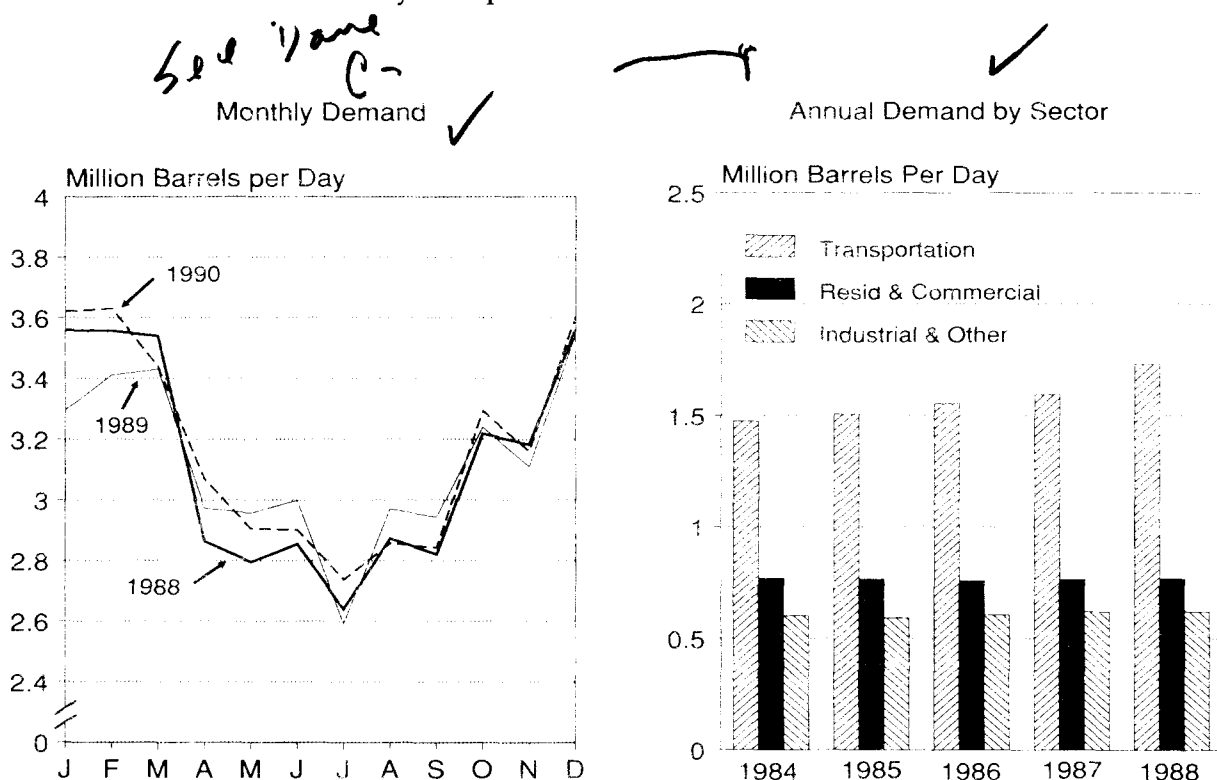


Figure 11. Distillate Fuel Oil Demand

Note: Projections begin with the fourth quarter of 1989.

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(89/08) (Washington, DC, 1989); and "Annual Report on Sales of Fuel Oil and Kerosene, 1988," in Appendix A of *Petroleum Marketing Monthly*, DOE/EIA-0380(89/07)
Projections: Table 11.

Residual Fuel Oil and Other Petroleum Products

Residual Fuel Oil

Residual fuel oil demand is expected to decline by 70,000 barrels per day during 1989 and by 120,000 barrels per day during 1990. While demand was strong in the first half of this year (driven by heavy incremental use at electric utilities), residual fuel oil demand is expected to exhibit declines averaging 210,000 barrels per day on a year-to-year basis in the first half of 1990 (Table 12). For the second half of 1990, residual fuel oil use is expected to be slightly below that of 1989. This pattern largely reflects high residual fuel oil demand at electric utilities over the 12-month period ending in June 1989. Conditions leading to high utility use of oil over that 12-month period—including low hydroelectric availability, periods of very favorable oil prices, some problems with natural gas availability to utilities, and temporarily low nuclear output during the first half of 1989—are not expected to be repeated during the forecast period. (See "Electricity Supply.") On the other hand, nonutility oil use has been comparatively weak in recent quarters. Barring unusual weather conditions or higher-than-anticipated economic growth, substantial increases in nonutility oil use are not expected.

Residual fuel oil deliveries increased by 9.5 percent in 1988 (Figure 12). Unusual factors resulted in a 24-percent jump in deliveries of residual fuel oil to the electric utility sector: the very hot weather during the summer helped increase demand for electricity; drought conditions reduced electricity output from hydroelectric sources; and lower residual fuel oil prices precipitated switching away from natural gas use. (See "Electricity Supply.")

In 1989, residual fuel oil deliveries are projected to decline by 5.1 percent. The growth of deliveries to the electric utility sector should slow sharply to only 1.6 percent, even though year-to-date increases through June averaged 35 percent.

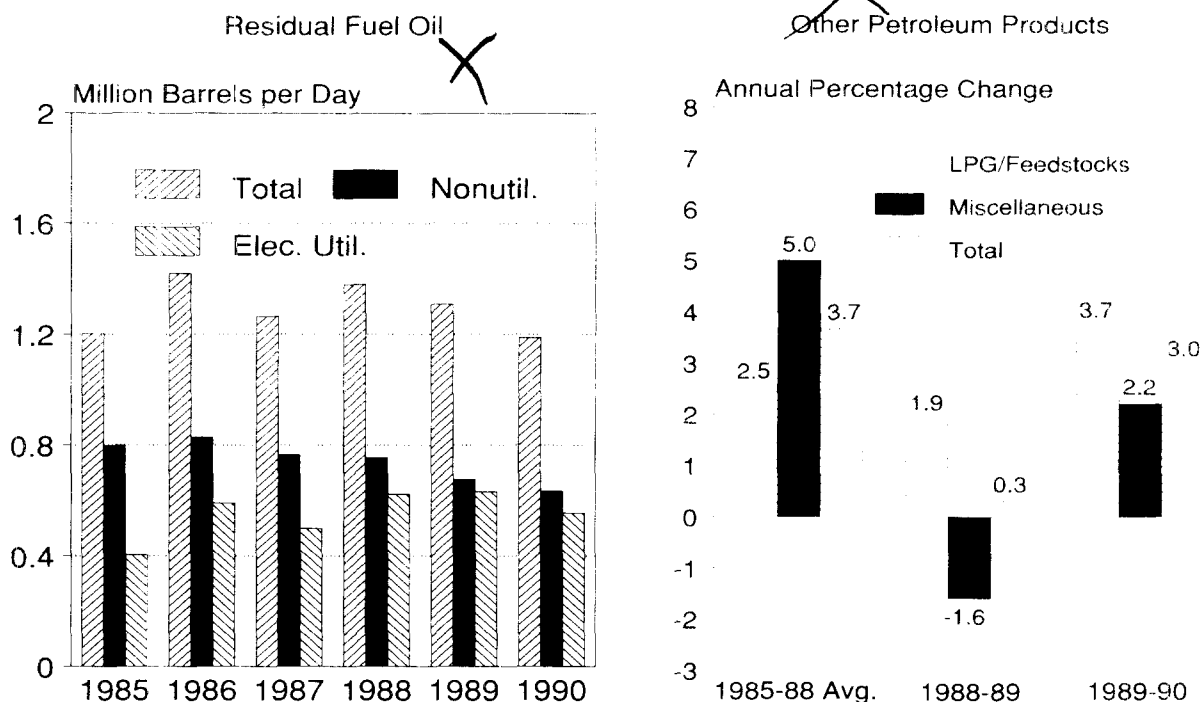


Figure 12. Residual Fuel Oil and Other Petroleum Products Demands

Note: Projections begin in the fourth quarter of 1989.

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(89/08), *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/2, and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to July 1989 (Washington, DC, 1989).
Projections: Tables 12 and 13.

One-time factors boosted deliveries of residual fuel oil during the first half of 1989. During that period, heavy fuel oil benefited from relatively high natural gas prices during the first quarter as well as larger-than-anticipated downtime in several nuclear power plants. Second-half estimates, however, reflect the combined effects of a cooler-than-average summer season, an increase in existing nuclear-powered generation as previously idle units come back on-stream, and increased natural gas availability. These factors, combined with the impact of the previous year's hot summer on heavy oil consumption, are expected to bring heavy fuel oil deliveries somewhat below those of the second half of 1988, moderating growth in deliveries for the year as a whole.

Heavy fuel oil deliveries to nonutility sectors are projected to decline by 9.3 percent in 1989. A slowdown in the increase in the growth of industrial production to 3.3 percent, as well as switching to more competitively priced natural gas, are expected to keep deliveries to the industrial sector below those of last year. In addition, the mild first quarter of this year is expected to result in a year-to-year decline in commercial demand for heavy fuel oil; and the availability of foreign bunker fuel oil will most likely constrain transportation deliveries.

In 1990, residual oil deliveries are projected to fall further by 9.2 percent. All of the major sectors are projected to contribute to that decline. Although electricity sales are projected to rise by 3.0 percent, shipments of heavy oil to electric utilities are projected to fall by 13 percent. The loss of market share for heavy oil results from continued expansion of generation from hydroelectric and nuclear power sources, displacement by natural gas, and increases in cogenerated and other independent electricity supplies. (See "Electricity Supply.") A slowdown in the projected increase in industrial production in 1990 to 1.2 percent, as well as continuing increases in industrial natural gas sales are expected to result in a further decline in heavy oil deliveries to the industrial sector as well. Transportation deliveries, which have been static over the past several years, are also expected to exhibit continued weakness because of the slowdown in economic growth as well as the availability of foreign bunker supplies. Deliveries to the commercial sector, however, are projected to register a slight increase in deliveries under assumptions of normal weather conditions.

Other Petroleum Products

Having benefited from the broad-based economic expansion in 1988, other petroleum products are expected to register virtually no growth in 1989 but moderate growth in the following year. In 1988, deliveries of other petroleum products rose 4.4 percent as a result of brisk economic growth. Increases in export-led demand for petrochemical products stimulated olefin demand and, hence, deliveries of petrochemical feedstocks. As a result, liquified petroleum gas (LPG) deliveries rose 3.1 percent, boosted by the colder-than-average winter in that year. In addition, low oil prices enabled oil-based feedstocks to capture a larger share of the olefin market, increasing by 4.5 percent over the previous year. The miscellaneous product category expanded 5.7 percent as a result of strong increases in asphalt and road oil deliveries as well as refinery-related increases in still gas production.

Demand for other petroleum products (excluding jet fuel) in 1989 is projected to remain virtually unchanged from that of the previous year. Consumption of LPG's is expected to rise by 2.4 percent, somewhat less than in the previous year. The slowdown in economic growth as well as the unusually mild winter account for much for the moderation in demand growth. In addition, LPG's are expected to benefit from their favorable prices. As a result, oil-based feedstock demand is projected to remain flat for the year. Miscellaneous product demand is projected to decline 1.6 percent, largely as a result of weather-related declines in asphalt and road oil demand.

In 1990, demand for other petroleum products (excluding jet fuel) is projected to rise by 3.0 percent. The combined effects of the resumption of normal weather patterns (compared to the mild winter of the previous year), favorable product prices, and continued growth in export-led petrochemical demand that outpaces economic growth are all expected to account for this increase.

Jet Fuel

After growing by an average of 6.4 percent from 1985 through 1988, jet fuel demand has slowed down considerably in the first half of 1989, and is projected to exhibit average growth of 1.7 percent per year in 1989 and 1990 (Table 13 and Figure 13). This slower growth is due to a projected slowdown in economic growth and a continued rise in airline ticket prices, even after adjustment for inflation.

In the first half of 1989, passenger traffic was growing at a modest pace, showing 3.0-percent growth in revenue passenger-miles (a measure of passenger traffic) compared to the first half of 1988.⁹ Most of this growth can be attributed to international traffic patterns, whereas domestic revenue passenger-miles grew by less than 1.0 percent in the first half 1989. Moreover, both domestic and international cargo traffic has been growing rapidly, which has buoyed overall traffic. Total revenue ton-miles (a measure of passenger and cargo traffic) has grown by 4.4 percent in the first half of 1989.

Since mid-1987, airline ticket prices have been increasing, growing by 3.0 percent in 1988 (adjusted for inflation) and continuing to rise in the first half of 1989. Between 1982 and 1987, ticket prices fell rather steadily, as competitive forces unleashed by airline deregulation combined with rapidly falling jet fuel prices to cause a period of discount fare wars. The current environment, however, is more conducive to fare increases, as airline capacity utilization has been pushed to practical limits in many instances, and industry consolidation through mergers and buyouts has tended to centralize and concentrate the market relative to the 1982-1987 period. Thus, a continuing upward trend in ticket prices is an appropriate assumption for this *Outlook*.

In the forecast period, airline ticket prices are projected to grow by an average of 3.0 percent per year in 1989 and 1990. Although the price of jet fuel is projected to decline somewhat in 1990, it is not expected to put as much downward pressure on airline ticket prices as it did previously because the share of jet fuel to total costs has declined markedly in the last 9 years. In 1980, the ratio of fuel and oil expense divided by total operating expense for the industry was 0.31; this ratio dropped to 0.14 in the first half of 1989.

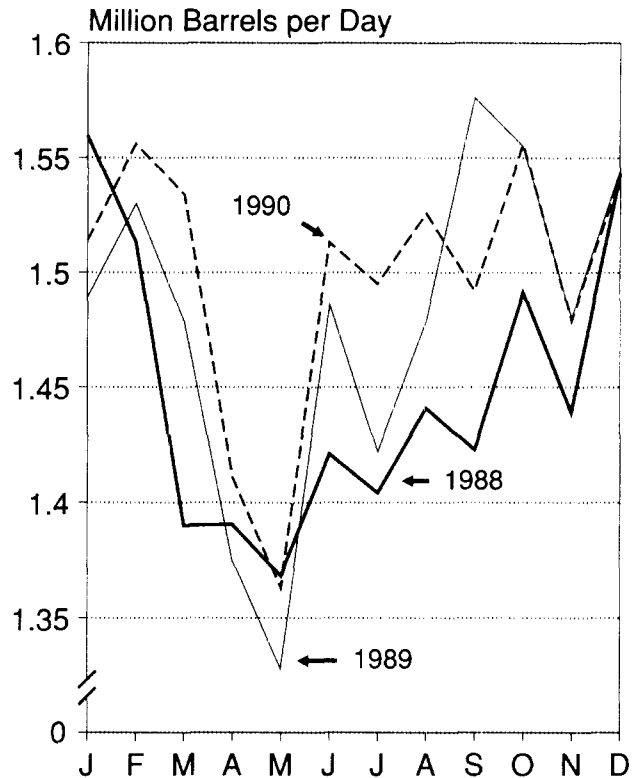


Figure 13. Jet Fuel Demand

Note: Projections begin with the fourth quarter of 1989.

Sources: **History:** Energy Information Administration, *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/2, and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to August 1989 (Washington, DC, 1989). **Projections:** Table 13.

Outlook for Other Major Energy Sources

- **Natural Gas**
- **Coal**
- **Electricity**

Natural Gas

Natural gas deliveries to consumers are projected to expand by only 0.30 trillion cubic feet, or 1.8 percent in 1989. The mild first quarter, in fact, is expected to account for much of the decline in deliveries to the residential/commercial sector for the year as a whole. Deliveries to the industrial sector, however, are projected to increase by 4.9 percent. Data for the first 6 months of 1989 indicate that the recovery of oil prices from the low levels of last year has stimulated natural gas deliveries at the expense of residual fuel oil to this sector. During that period, industrial gas demand rose by 5.2 percent; nonutility residual fuel oil consumption declined by 14 percent.¹⁰

In 1990, natural gas delivered to consumers is projected to increase 0.23 trillion cubic feet, or 1.4 percent, similar to that of the previous year. The composition of that growth, however, differs from that of 1989. As this forecast assumes normal weather patterns, in contrast to the mild weather in 1989, combined residential and commercial deliveries are projected to rise by 2.5 percent, reversing the previous year's decline. Despite the small projected increase in industrial activity, gas deliveries to the industrial sector are projected to increase by 1.6 percent. Oil prices are projected to remain close to the 1989 average, enabling natural gas to continue to capture a growing share of the industrial market.

Deliveries to the electric utility sector are projected to rise slightly in 1989. Several utilities have apparently increased their purchases of natural gas as supplies have become more available during the past several months. But, the year-to-year increase in deliveries to this sector would have been greater in the absence of local curtailments, such as that which limited Southern California Gas Company (SCGC) supplies to its electric utility customers during the first quarter.

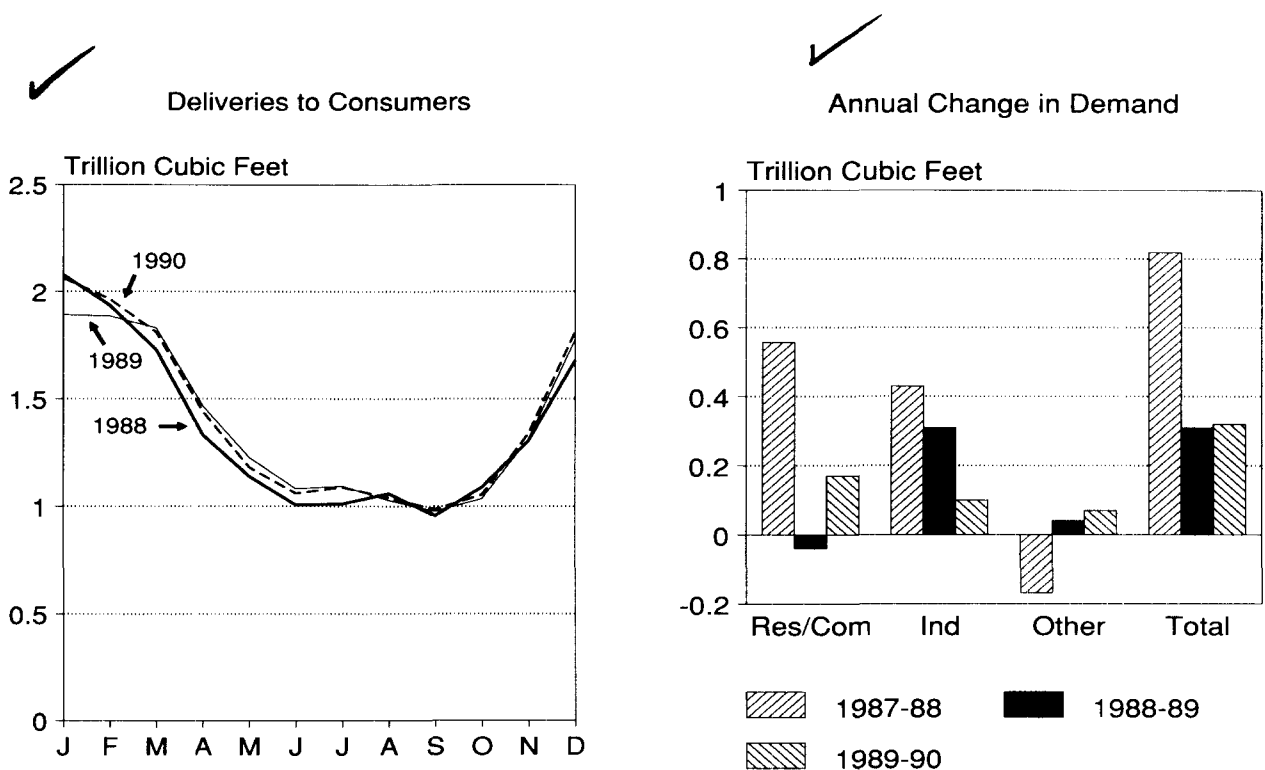


Figure 14. Natural Gas Demand

Note: Projections begin in the fourth 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(89/07) (Washington, DC, 1989).
Projections: Table 14.

Natural gas purchases by electric utilities are projected to decline by 2.3 percent in 1990. Because of its price advantage, however, the gas share of the shrinking electric utility market for natural gas and residual fuel oil is projected to increase. Electricity generation from hydroelectric and nuclear-powered sources, however, is projected to increase substantially and contribute to the displacement of both natural gas and heavy fuel oil.

Revised data show that disposition of natural gas to the four major end-use sectors increased by 0.78 trillion cubic feet, or 5.0 percent, in 1988 (Table 14 and Figure 14). The colder-than-average weather in the first quarter boosted residential/commercial sector usage by 8.3 percent for the year as a whole. In addition, the 6.0-percent surge in industrial production contributed to the 7.2-percent increase in natural gas deliveries to that sector. Deliveries to the price-sensitive electric utility sector, however, declined by 7.4 percent despite the 5.0-percent increase in electricity generation requirements brought about by warm weather in the third quarter. Heavy fuel oil displaced substantial amounts of natural gas, resulting in a substantial year-to-year decrease in natural gas deliveries in that quarter. Deliveries of natural gas in 1988 were further constrained by a 16-percent increase in nuclear-powered generation, and the 5.1-percent growth in coal-powered generation.

Coal

The on-going coal strike by the United Mine Workers of America against the Pittston Coal Company, which began in April 1989 and was augmented by widespread wildcat strikes throughout the East in June and July, appears to have had little impact on overall supply and demand balances. Moreover, the increase of almost 10 million tons in second-quarter secondary stocks, largely attributable to electric utilities, is in line with the seasonal build-up that usually precedes the high demand in the third quarter.

For 1989, the impact of the strike has been masked by the sharp slowdown in consumption growth, which is projected to register a 0.8-percent increase, following a brisk, 5.7-percent increase in the previous year (Table 15 and Figure 15). Much of the slowdown in the rate of growth is brought about by the electric utility sector, where the combined effects of a slowdown in electricity demand growth and a substantial recovery of hydroelectric generation from the depressed levels of the previous year are expected to limit growth in utility demand for coal to only 0.1 percent. Coal demand by coke plants is projected to remain constant, considerably different from the torrid 13-percent increase in 1988. The decline in growth in steel production, the continued availability of imported sources of coke, and the trend toward electric-arc furnaces are projected to constrain demand for coking coal. The milder-than-normal first quarter and normal weather in the fourth quarter are projected to reduce coal demand to residential/commercial customers by more than 14 percent from levels of last year.

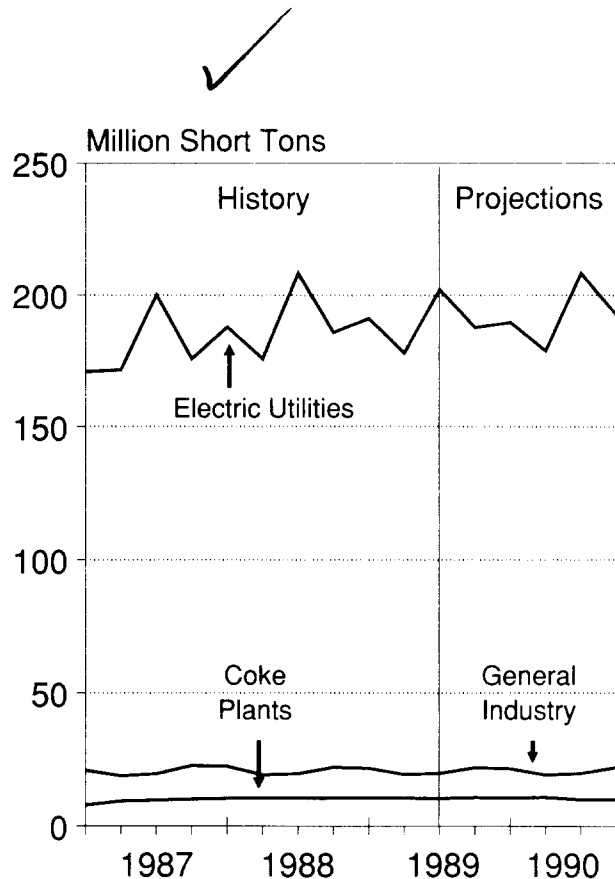


Figure 15. Coal Consumption

Sources: **History:** Energy Information Administration, *Quarterly Coal Report*, DOE/EIA-0121(89/2Q) (Washington, DC, 1989). **Projections:** Table 15.

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Growth in coal demand in 1990 is projected to decline further to only 0.4 percent. A further slowdown in the increase in industrial activity in conjunction with continued implementation of the electric-arc technology is expected to result in a 2.4-percent decline in demand by coke plants and a 0.3-percent reduction by other industrial users. The return of normal weather patterns, however, is expected to lift coal consumption by electric utilities by 1.3 percent and to residential/commercial users by 1.3 percent.

Coal exports are projected to increase only 2.1 percent in 1989, compared to the 19-percent increase seen in 1988. The 1988 increase was primarily due to a surge in demand for steel, together with supply problems which affected some of the world's other major exporters, especially Australia, Poland, and Colombia. Further increases in 1989 are based on a continuation of those trends, but by 1990 it is assumed that supply problems by other exporters will abate somewhat, leading to a decline of almost 2.1 percent in U.S. exports compared to 1989.

Electricity

Electricity Demand

Growth in electricity demand appears to have slackened from the 4.5-percent rate recorded in 1988. This slackening is mostly the result of abnormal weather patterns in both years. An estimated decline between the third quarter of last year and the third quarter of this year is

the result of last year's record summer temperatures in contrast to the mild temperatures of this past summer. After subtracting these weather effects, electricity sales growth for 1989 as a whole is expected to slow by less than one half of a percentage point from the 1988 weather adjusted rate of 3.7 percent.¹¹

In 1989, the unusually mild weather—in contrast to the cold winter and hot summer of the previous year—as well as a slowdown in the economy account for much of the projected moderation in growth of total electricity to 1.8 percent (Table 16). After adjusting for differences in weather patterns in both years, however, this projection is 3.3 percent. The first quarter of 1989 was 6.6 percent milder than the same quarter in 1988 (Table 4). In addition, the third quarter was 15 percent cooler than last year's unusually warm third quarter, contributing to the decline of 1.1 percent in total electricity sales expected for this quarter. As a result, electricity usage in the residential sector is projected to remain almost unchanged for the year as a whole (Figure 16). In the commercial sector, deviations in weather patterns, as well as the gradual slowdown in economic growth result in a projected electricity sales growth rate of 2.7 percent for all of 1989, half that of the previous year. Industrial sales are projected to increase by 2.1 percent, less than half that of the previous year, reflecting the substantial moderation in the growth of industrial production.

In 1990, growth in electricity usage is projected to accelerate to 3.0 percent. After adjusting for the mild weather in 1989 that depressed consumption, however, this rate is closer to 2.2 percent, reflecting moderate economic growth. Given normal weather patterns for the year (that is, a colder winter and a warmer

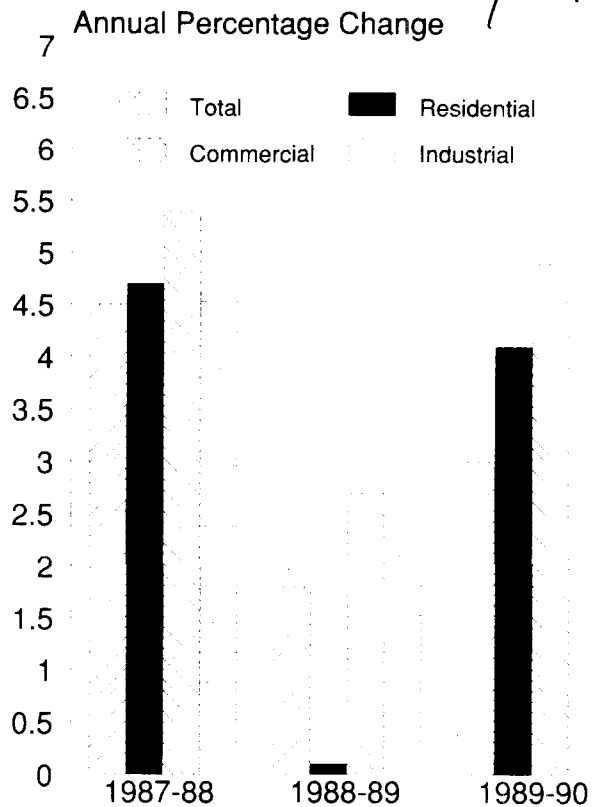


Figure 16. Electricity Sales Growth by Sector

Note: Projections begin in the fourth quarter of 1989.
Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(89/07). **Projections:** Table 16.

summer than occurred in 1989), residential electricity sales are projected to recover much of the previous year's lost momentum, increasing by 4.1 percent (Figure 16). Both the growth in the service sector that is projected to outpace that of the overall economy and the impact of the year-to-year changes in the weather are expected to boost electricity sales to commercial customers by 4.9 percent. The stagnation in industrial output, however, is expected to constrain growth in electricity sales to that sector to only 0.7 percent.

Electricity Supply

The electricity supply picture for 1989 and 1990 features continuing strong growth in nonutility sources of supply, comparatively low levels of electricity imports, and modest pressure on domestic electric utilities for increased output (Table 16). For domestic utilities, in both 1989 and 1990, there will be some shift from fossil fuels toward hydropower and nuclear supply sources. Coal use at electric utilities is expected to increase in 1990, albeit at a modest rate. Petroleum and natural gas use at utilities is expected to wane in the face of resurging hydropower availability and improved performance at nuclear plants throughout the forecast (Figure 17). Total electricity sales are expected to grow by 3.0 percent in 1990, whereas total generation from domestic electric utilities is expected to increase by a more modest 2.0 percent.

Due to improved watershed conditions in many areas of the country, hydroelectric generation has already started its long-awaited recovery from the low levels experienced in the 2-year drought. Even though precipitation levels have continued to be lower than normal in some areas of the country such as California and some Central States, hydroelectric generation is projected to rebound sharply, growing by 21 percent in 1989. Assuming normal precipitation for the forecast period, hydroelectric power is expected to reach normal levels in 1990.

Because of maintenance outages at several units, nuclear power declined in the first half of 1989. In the second half of 1989, nuclear power is projected to recover somewhat, but still yield a 1.1-percent decline for the entire year. By 1990, capacity factors are projected to increase to about their 1988 levels and nuclear power is projected to grow by 5.5 percent.

Coal-fired generation is expected to decline 0.4 percent in 1989 but grow by 1.9 percent in 1990. This slower growth is the result primarily of the increased availability of hydroelectric power and slower growth in total generation.

The combined amount of generation from petroleum and natural gas is projected to increase slightly in 1989 and decline by 6.2 percent in 1990. The large increase in hydroelectric power in 1989 and increases in both hydroelectric and nuclear power in 1990 leave little need for increases in generation from these two fuels. Assuming that the price of residual fuel oil remains high relative to natural gas, and that normal weather patterns prevail, it is expected that the use of oil at electric utilities will drop off in the

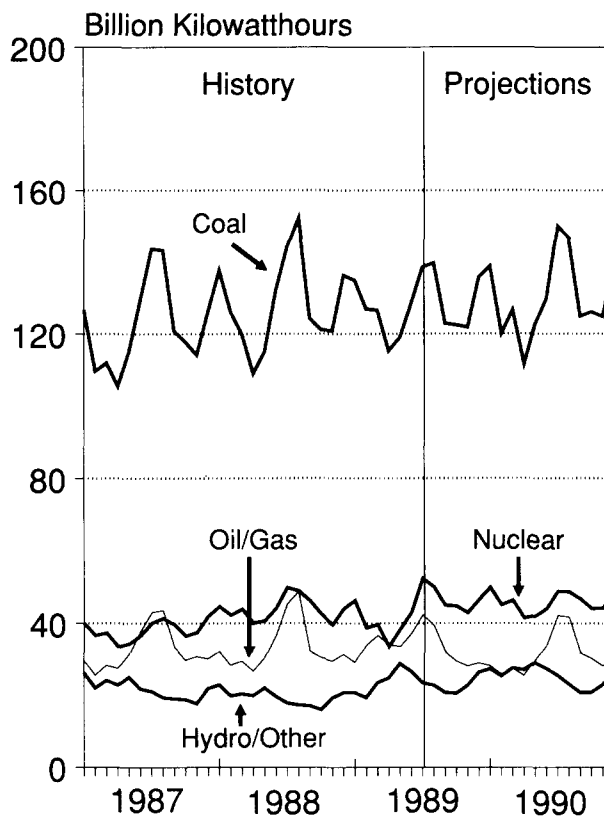


Figure 17. Electricity Generation by Fuel Source

Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(89/07) (Washington, DC, 1989). **Projections:** Table 16.

second half of 1989 and throughout 1990. Natural gas should remain fairly constant in 1989 and drop off somewhat in 1990.

Net imports of electricity are projected to decline in 1989 as a result of continued economic growth in Canada, the effect drought conditions in parts of Canada, and reduced availability of electricity generated from coal as a result of new air-pollution standards in Ontario. These conditions are expected to persist and prevent imports from returning to previous levels through 1990. The modest rise in net imports expected for next year is based on some recovery in reservoir levels in Canada and new firm commitments beginning in the end of 1990.

Special Topics

- **Winter Distillate Outlook**
- **Analysis of Winter Weather Variability**

Winter Distillate Outlook

Growth in the demand for distillate fuel oil in the transportation and industrial sectors since last year, and prospects for greater average demand for heating oil during the upcoming winter (assuming normal weather compared to last winter's mild weather), signal potential pressure on the distillate supply system this winter. The base case scenario calls for average distillate demand this winter (from October through March) of 3.43 million barrels per day, 2.4 percent above last winter's average rate. Even keeping increases in domestic refinery output of distillate to a minimum (under 2 percent over last year), refinery output of 2.93 million barrels per day is likely. Assuming a minimum primary stock level of 90 million barrels by winter's end, increases in distillate net imports averaging 35,000 barrels per day may be required. If this materializes, net imports of distillate fuel oil of 310,000 barrels per day would establish a record for an entire winter period. Since this *Outlook* assumes winter weather which is somewhat milder than last year for the fourth quarter and more severe (but still normal) for the first quarter of 1990 compared to 1989 conditions, it is important to examine the implications for the distillate supply system of plausibly severe winter weather conditions (Table 4).

The most severe winter quarters (in terms of heating degree-days) over the last 15 years occurred in 1975 and 1977 for the fourth and first quarters, respectively.¹² These conditions provide the basis of the adverse winter weather scenario summarized in Table 7. The implication of such conditions for distillate fuel demand in today's market, while less significant than when heating oil was more prevalent, could still amount to an additional 140,000 barrels per day in the fourth quarter and 170,000 barrels per day in the first quarter (for a winter average of 155,000 barrels per day), compared to base case levels.¹³ The probability of extreme temperatures in either of the winter quarters is small, and the probability of two such quarters following in succession is undoubtedly minute.

Supplying additional fuel oil under the scenario of extreme weather conditions would result in higher levels of imports, and perhaps higher domestic refinery utilization rates. Although the latter would require an extraordinary level of domestic refining output. Capacity utilization over the winter months is projected to average 87 percent, already the highest utilization rate for any previous winter. Meeting the additional demand for distillate would require a level of utilization averaging close to 90 percent. Such a level is possible for several months, but not likely over the entire winter. Certainly, refinery yields of distillate would be expected to increase. By increasing the refinery yield of distillate to its historical average high for any winter (23 percent), however, the additional requirements for demand are more than matched, at the expense of production of other products. An increase in drawdowns of primary distillate stocks most likely will not be the dominant source for supplying marginal increases in demand related to weather. Generally, the use of primary stocks has become less important in supplying winter demand for distillate. The level of stocks at the start of this winter was 122 million barrels, 7 percent below the beginning level of a year ago. Ending stocks in March 1990 are projected at 90 million barrels, approaching the lowest level of ending stocks in recent history. Less reliance on inventory coincides with lower demand for heating oil compared to the early part of the decade, more competition from imports, and somewhat greater use of hedging techniques and other options to ensure supply.

While the severe weather scenario assumes no disruption in the distribution system for distillate fuel oil, the effect of such extreme temperatures on retail prices of heating oil would be expected to range from \$0.05 to \$0.10 per gallon above base case levels, depending on weather and supply conditions in other parts of the world.¹⁴

Analysis of Winter Weather Variability

This article considers the 1990 winter weather in the context of previous winters to test the assumption that the 1990 winter weather will be normal. National heating degree-days (HDD) data for the previous 50 years was analyzed to discern possible trends or cycles in the winter weather.

National Heating Degree-Day Trends, 1940-1989

National heating degree-day data for the fourth and first quarters (October through March) of the past 50 years, 1940 through 1989, were analyzed and graphed. The 50-year national average HDDs, 4,035 HDDs, was assumed to be normal for this analysis. As seen in Figure 18, cycles in winter weather are far from clearly evident. From 1940 through 1957, winters tended to be warmer than normal, while from 1958 through 1971 winters tended to be colder than normal. Again from 1972 through 1976, winters tended to be warmer than normal, while from 1977 through 1981 winters tended to be colder, particularly in 1977 and 1978 which set a record for the 50-year period. For the past 5 years, there has been somewhat less variability, as HDDs have tended to stay closer to the 50-year average than in any previous period, except between 1964 and 1968. In this recent 5-year period, HDDs have averaged only 28 degree-days below normal. A similar trend, which occurred in 1964 to 1968, resulted in a 5-year average only 29 HDDs above normal.

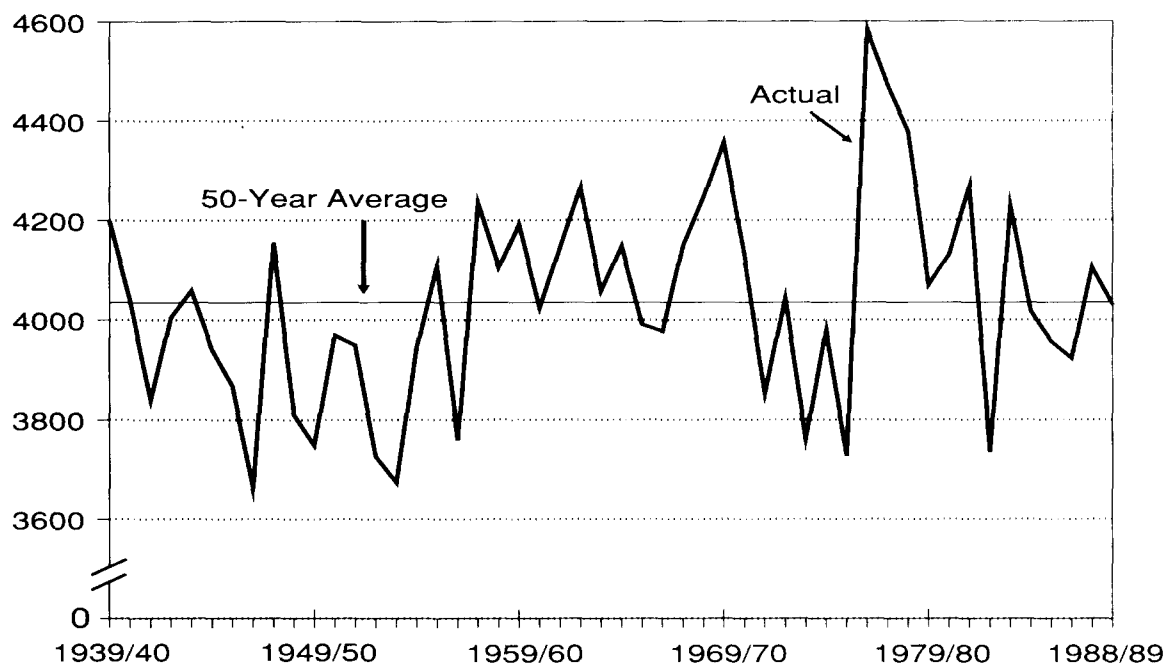


Figure 18. Winter Heating Degree-Days, 1940-1989

Note: Winter extends from the fourth quarter of a year through the first quarter of the following year.
Source: Statistics based on heating degree-day data published by the National Oceanographic and Atmospheric Administration, *Monthly, State, Regional, and National Heating Degree Days Weighted by Population* (Asheville, NC).

The table below shows the probability of HDDs being between 0 and 20 percent above or below the 50-year national average. The probabilities are based on the assumption that the HDDs are distributed normally. The statistics required for the probability calculations are derived from the 50-year sample illustrated in Figure 18. A normal distribution does not seem to be an unreasonable assumption for the sample period (see footnote *a* in the table below). The probability of getting as severe a winter as the 1977 winter—the coldest in the 50-year period (12 percent colder than normal)—is 4.5 percent.

It would appear that, given the record of the past 50 winters, the probability of the 1990 winter showing a deviation of 0 to 5 percent above or below normal is 68 percent. This would be an increase or decrease of up to 202 HDDs relative to the norm. However, as the sudden reversal from an exceptionally warm winter to an exceptionally cold winter in 1976/1977 indicates, trends can abruptly change. The period 1964 through 1968 had HDDs consistently near normal but was followed by the unusually cold winter of 1969/1970.

Geography is cited by the National Oceanographic and Atmospheric Administration (NOAA) as a factor which affects weather patterns considerably, and this is evident from comparing regional data. Weather in the coastal (including the Gulf coast) regions, particularly in the South Atlantic (that is, the Middle Atlantic, South Atlantic, West South Central, and East South Central Divisions), as well as the Great Lakes region (that is, the East North Central Division), tend to be more predictable than the interior regions, as the presence of large bodies of water has a modifying effect on temperatures. Weather in the interior regions of the country (that is, the Mountain and West North Central Divisions), tend to be more unpredictable and less stable.

Cyclical factors having a controlling impact on global weather are:

1. The large weather systems that dominate U.S. weather in the winter months, particularly the Pacific-North American pattern
2. El Nino and La Nina, the pools of unusually warm and cold water along the Equator in the Pacific which regulate global climate
3. The seasons
4. Sunspot activity, which has been demonstrated to show a statistical correlation with shifts in wind patterns and other atmospheric phenomenon.

Although all these factors occur in cycles, no cyclic trends in the weather are discernible over the long term, as these factors interact with each other in unpredictable ways.

Probability of Deviation From Normal for Heating Degree-Days for the Winter 1989/1990

Deviation From Normal (percent)	Probability of Occurrence ^a (percent)
0 - 5	67.8
5 - 10	27.4
10 - 15	4.5
15 - 20	0.3

^aThe chance of heating degree-days (HDDs) falling within the corresponding range of percent deviations above or below normal during the Winter of 1989/1990, assuming that HDDs are distributed normally. The assumption of normality is appropriate according to the Lilliefors Test for normality.

Note: Heating degree-days are defined as the variation in temperature below 65° Fahrenheit (calculated as the simple average of the daily minimum and maximum temperatures) weighted by 1980 population.

Source: Based on heating degree-day data published by the U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, *Monthly, State, Regional, and National Heating Degree Days Weighted by Population* (Asheville, NC).

References

1. McGraw-Hill, Inc., *Platt's Oilgram Price Report* (New York, NY, 1989).
2. Energy Information Administration, *Petroleum Supply Annual*, DOE/EIA-0340(88)/1 (Washington, DC, May 1989), p. 98.
3. Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109(89/07) (Washington, DC, 1989), Table 30.
4. Energy Information Administration, *Petroleum Supply Annual*, Table 15.
5. In this *Outlook*, the revisions to the National Income and Product Accounts data for 1986 through 1988, issued in July of this year, are incorporated in the historical information on GNP and other affected macroeconomic variables. For 1988, these revisions raised the level of real GNP by \$28 billion (in 1982 dollars), and increased the real GNP growth rate for 1988 to 1987 from 3.9 percent to 4.4 percent.
6. PennWell Publishing Co., *Oil and Gas Journal*, October 30, 1989.
7. Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380 (Washington, DC), various issues.
8. Oak Ridge National Laboratory, *Light-Duty Vehicle Summary: Model Year 1976 to the First Half of Model Year 1989* (August 1989).
9. All airline traffic statistics are obtained from I.P. Sharp Associates, Limited (Toronto, Canada).
10. Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(89/07) (Washington, DC, 1989).
11. The weather-corrected figures are based on internal calculations by the Demand Analysis and Forecasting Branch, and are available upon request.
12. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Monthly State, Regional, and National Heating Degree Days Weighted by Population* (Asheville, NC).
13. The distillate demand increases generated for the severe weather cases stem from the detailed model runs used to support Table 7 in this *Outlook* and are available from the Demand Analysis and Forecasting Branch upon request.
14. Estimates for price effects are internal calculations of the Demand Analysis and Forecasting Branch.

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
Supply ^a															
Production															
U.S. (50 States)	10.65	10.54	10.33	10.38	10.12	10.02	<i>9.81</i>	<i>9.93</i>	<i>9.88</i>	<i>9.70</i>	<i>9.64</i>	<i>9.65</i>	10.47	<i>9.97</i>	<i>9.71</i>
OPEC	19.55	20.39	21.71	24.25	22.01	23.05	<i>24.21</i>	<i>24.45</i>	<i>23.00</i>	<i>23.20</i>	<i>24.00</i>	<i>24.50</i>	21.48	<i>23.44</i>	<i>23.68</i>
Other Non-OPEC	16.89	16.53	16.35	16.48	16.57	16.16	<i>16.81</i>	<i>17.28</i>	<i>17.62</i>	<i>17.43</i>	<i>17.72</i>	<i>17.64</i>	16.56	<i>16.70</i>	<i>17.60</i>
Total Market Economies	47.08	47.46	48.38	51.10	48.69	49.23	<i>50.83</i>	<i>51.66</i>	<i>50.49</i>	<i>50.33</i>	<i>51.35</i>	<i>51.78</i>	48.51	<i>50.11</i>	<i>51.00</i>
Net Communist Exports	2.02	2.56	2.67	2.47	2.12	2.26	<i>2.37</i>	<i>2.44</i>	<i>1.90</i>	<i>2.25</i>	<i>2.45</i>	<i>2.20</i>	2.43	<i>2.30</i>	<i>2.20</i>
Total Supply	49.10	50.02	51.05	53.57	50.82	51.49	<i>53.20</i>	<i>54.10</i>	<i>52.39</i>	<i>52.58</i>	<i>53.80</i>	<i>53.99</i>	50.94	<i>52.41</i>	<i>53.20</i>
Net Stock Withdrawals or Additions (-)															
U.S. (50 States Excluding SPR)58	-.52	-.13	.39	.38	-.36	<i>-.51</i>	<i>.36</i>	<i>.48</i>	<i>-.26</i>	<i>-.41</i>	<i>.20</i>	.08	<i>-.03</i>	<i>.00</i>
U.S. SPR	-.05	-.06	-.05	-.05	-.07	-.06	<i>-.06</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	-.05	<i>-.06</i>	<i>-.05</i>
Other Market Economies67	-.93	-.82	-.52	1.12	-1.23	<i>-1.86</i>	<i>-.82</i>	<i>.77</i>	<i>-1.45</i>	<i>-1.27</i>	<i>.35</i>	-.40	<i>-.71</i>	<i>-.40</i>
Total Stock Withdrawals	1.20	-1.51	-1.00	-.19	1.43	-1.65	<i>-2.43</i>	<i>-.51</i>	<i>1.20</i>	<i>-1.76</i>	<i>-1.73</i>	<i>.50</i>	-.37	<i>-.80</i>	<i>-.45</i>
Product Supplied															
U.S. (50 States)	17.59	16.60	17.08	17.86	17.62	16.81	<i>16.89</i>	<i>17.69</i>	<i>17.69</i>	<i>16.84</i>	<i>17.29</i>	<i>17.82</i>	17.28	<i>17.25</i>	<i>17.41</i>
U.S. Territories20	.21	.21	.17	.20	.23	<i>.21</i>	<i>.20</i>	<i>.19</i>	<i>.21</i>	<i>.21</i>	<i>.20</i>	.20	<i>.21</i>	<i>.20</i>
Canada	1.57	1.52	1.61	1.70	1.63	1.64	<i>1.67</i>	<i>1.75</i>	<i>1.63</i>	<i>1.63</i>	<i>1.70</i>	<i>1.78</i>	1.60	<i>1.67</i>	<i>1.69</i>
Japan	5.23	4.18	4.31	5.21	5.45	4.45	<i>4.59</i>	<i>5.55</i>	<i>5.78</i>	<i>4.59</i>	<i>4.77</i>	<i>5.67</i>	4.73	<i>5.01</i>	<i>5.20</i>
Australia and New Zealand75	.77	.77	.79	.78	.80	<i>.79</i>	<i>.81</i>	<i>.78</i>	<i>.82</i>	<i>.81</i>	<i>.83</i>	.77	<i>.80</i>	<i>.81</i>
OECD Europe	12.35	11.78	12.10	13.21	12.61	11.86	<i>12.49</i>	<i>13.21</i>	<i>12.94</i>	<i>12.06</i>	<i>12.58</i>	<i>13.23</i>	12.36	<i>12.54</i>	<i>12.70</i>
Total OECD	37.69	35.06	36.08	38.93	38.29	35.78	<i>36.64</i>	<i>39.20</i>	<i>39.01</i>	<i>36.14</i>	<i>37.36</i>	<i>39.53</i>	36.94	<i>37.48</i>	<i>38.01</i>
Other Market Economies	13.69	13.80	13.74	13.97	14.33	14.42	<i>14.43</i>	<i>14.67</i>	<i>14.88</i>	<i>14.97</i>	<i>14.98</i>	<i>15.24</i>	13.80	<i>14.46</i>	<i>15.02</i>
Total Market Economies	51.37	48.86	49.82	52.90	52.63	50.19	<i>51.07</i>	<i>53.87</i>	<i>53.89</i>	<i>51.11</i>	<i>52.34</i>	<i>54.77</i>	50.74	<i>51.94</i>	<i>53.03</i>
Statistical Discrepancy	1.07	.34	-.23	-.49	.38	.35	<i>.30</i>	<i>.28</i>	<i>.30</i>	<i>.29</i>	<i>.27</i>	<i>.28</i>	.17	<i>.33</i>	<i>.29</i>
Closing Stocks (billion barrels)	4.99	5.13	5.22	5.24	5.11	5.26	<i>5.49</i>	<i>5.53</i>	<i>5.42</i>	<i>5.58</i>	<i>5.74</i>	<i>5.70</i>	5.24	<i>5.53</i>	<i>5.70</i>

^a 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(89/07); and *International Energy Annual 1987*, DOE/EIA-0219(87); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through March 1989.

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

	Annual Average 1977-1987	1988	1989	1990
OECD Total ^a	2.6	4.2	<i>3.3</i>	<i>2.6</i>
United States ^b	2.7	4.4	<i>2.9</i>	<i>1.8</i>
Western Europe	2.1	3.5	<i>3.3</i>	<i>2.9</i>
Japan	4.1	5.9	<i>4.7</i>	<i>3.9</i>
Other OECD ^c	3.1	4.3	<i>2.8</i>	<i>1.5</i>

^a 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).

^b Gross national product.

^c 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, CONTROL0989; 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*, October 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 ^a																	
Real Gross National Product (billion 1982 dollars)	3,975	4,011	4,043	4,069	4,107	4,134	<i>4,152</i>	High	<i>4,213</i>	<i>4,260</i>	<i>4,288</i>	<i>4,307</i>	<i>4,347</i>		<i>4,156</i>	<i>4,301</i>	
								Base	<i>4,164</i>	<i>4,181</i>	<i>4,198</i>	<i>4,218</i>	<i>4,258</i>	4,024	<i>4,139</i>	<i>4,214</i>	
								Low	<i>4,116</i>	<i>4,101</i>	<i>4,108</i>	<i>4,129</i>	<i>4,168</i>		<i>4,123</i>	<i>4,127</i>	
Percentage Change from Prior Year	5.1	4.9	4.4	3.4	3.3	3.1	<i>2.7</i>	High	<i>3.5</i>	<i>3.7</i>	<i>3.7</i>	<i>3.3</i>	<i>3.2</i>		<i>3.3</i>	<i>3.5</i>	
								Base	<i>2.3</i>	<i>1.8</i>	<i>1.5</i>	<i>1.6</i>	<i>2.2</i>	4.4	<i>2.9</i>	<i>1.8</i>	
								Low	<i>1.1</i>	<i>-1</i>	<i>-6</i>	<i>-1</i>	<i>1.3</i>		<i>2.5</i>	<i>.1</i>	
GNP Implicit Price Deflator (index, 1982=1.000)	1.192	1.206	1.219	1.233	1.245	1.259	<i>1.273</i>	High	<i>1.278</i>	<i>1.288</i>	<i>1.302</i>	<i>1.317</i>	<i>1.327</i>		<i>1.263</i>	<i>1.309</i>	
								Base	<i>1.283</i>	<i>1.295</i>	<i>1.311</i>	<i>1.326</i>	<i>1.336</i>	1.213	<i>1.265</i>	<i>1.317</i>	
								Low	<i>1.287</i>	<i>1.303</i>	<i>1.320</i>	<i>1.335</i>	<i>1.345</i>		<i>1.267</i>	<i>1.326</i>	
Percentage Change from Prior Year	2.8	3.0	3.4	4.0	4.4	4.4	<i>4.4</i>	High	<i>3.6</i>	<i>3.4</i>	<i>3.5</i>	<i>3.6</i>	<i>3.8</i>		<i>4.2</i>	<i>3.6</i>	
								Base	<i>4.0</i>	<i>4.0</i>	<i>4.2</i>	<i>4.2</i>	<i>4.2</i>	3.3	<i>4.3</i>	<i>4.1</i>	
								Low	<i>4.4</i>	<i>4.7</i>	<i>4.9</i>	<i>4.8</i>	<i>4.5</i>		<i>4.5</i>	<i>4.7</i>	
Real Disposable Personal Income ^b (billion 1982 dollars)	2,757	2,773	2,806	2,836	2,882	2,887	<i>2,910</i>	High	<i>2,967</i>	<i>2,990</i>	<i>2,992</i>	<i>2,989</i>	<i>3,022</i>		<i>2,915</i>	<i>2,998</i>	
								Base	<i>2,931</i>	<i>2,932</i>	<i>2,926</i>	<i>2,925</i>	<i>2,957</i>	2,793	<i>2,903</i>	<i>2,935</i>	
								Low	<i>2,895</i>	<i>2,873</i>	<i>2,861</i>	<i>2,860</i>	<i>2,891</i>		<i>2,890</i>	<i>2,871</i>	
Percentage Change from Prior Year	3.2	5.3	4.9	4.0	4.5	4.1	<i>3.7</i>	High	<i>4.6</i>	<i>3.8</i>	<i>3.6</i>	<i>2.3</i>	<i>1.9</i>		<i>4.3</i>	<i>2.9</i>	
								Base	<i>3.3</i>	<i>1.7</i>	<i>1.4</i>	<i>.5</i>	<i>.9</i>	4.4	<i>3.9</i>	<i>1.1</i>	
								Low	<i>2.1</i>	<i>-3</i>	<i>-9</i>	<i>-1.3</i>	<i>-1</i>		<i>3.5</i>	<i>-7</i>	
Index of Industrial Production (Mfg.) (index, 1977=1.000)	1.396	1.416	1.440	1.458	1.470	1.480	<i>1.477</i>	High	<i>1.507</i>	<i>1.532</i>	<i>1.550</i>	<i>1.568</i>	<i>1.591</i>		<i>1.487</i>	<i>1.560</i>	
								Base	<i>1.469</i>	<i>1.470</i>	<i>1.479</i>	<i>1.497</i>	<i>1.520</i>	1.427	<i>1.474</i>	<i>1.492</i>	
								Low	<i>1.430</i>	<i>1.407</i>	<i>1.408</i>	<i>1.427</i>	<i>1.448</i>		<i>1.461</i>	<i>1.423</i>	
Percentage Change from Prior Year	6.1	6.3	6.1	5.6	5.3	4.6	<i>2.6</i>	High	<i>3.4</i>	<i>4.2</i>	<i>4.7</i>	<i>5.2</i>	<i>5.6</i>		<i>4.2</i>	<i>4.9</i>	
								Base	<i>.8</i>	<i>.0</i>	<i>-1</i>	<i>1.4</i>	<i>3.4</i>	6.0	<i>3.3</i>	<i>1.2</i>	
								Low	<i>-1.9</i>	<i>-4.3</i>	<i>-4.9</i>	<i>-2.6</i>	<i>1.2</i>		<i>2.4</i>	<i>-2.6</i>	
Oil Price																	
Imported Crude Oil Price ^c (U.S. dollars/barrel)	15.48	15.75	14.36	13.21	16.76	18.97	<i>17.60</i>	Low	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>		<i>17.10</i>	<i>15.00</i>	
								Base	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	14.64	<i>17.70</i>	<i>17.50</i>	
								High	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>		<i>18.30</i>	<i>20.00</i>	
Weather ^d																	
Heating Degree Days	2,451	523	83	1,741	2,289	557	<i>77</i>		<i>1,669</i>	<i>2,401</i>	<i>536</i>	<i>88</i>	<i>1,669</i>	4,798	<i>4,592</i>	<i>4,694</i>	
Cooling Degree Days	22	327	845	60	39	315	<i>716</i>		<i>63</i>	<i>28</i>	<i>327</i>	<i>755</i>	<i>63</i>	1,254	<i>1,133</i>	<i>1,172</i>	

^a 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.

^b Seasonally adjusted at annual rates.

^c Cost of imported crude oil to U.S. refiners.

^d 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(89/07); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, June 1988; 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 1988. Macroeconomic projections are based on modifications to Data Resources, Inc., Forecast CONTROL0989.

**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
Imported Crude Oil Price ^a (dollars per barrel)	15.48	15.75	14.36	13.21	16.76	18.97	17.60	Low	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>	<i>15.00</i>		<i>17.10</i>	<i>15.00</i>
								Base	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	<i>17.50</i>	14.64	<i>17.70</i>	<i>17.50</i>
								High	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>		<i>18.30</i>	<i>20.00</i>
Natural Gas Wellhead Price (dollars per thousand cubic feet)	1.84	1.55	1.57	1.78	1.84	1.61	1.70	Low	<i>1.71</i>	<i>1.72</i>	<i>1.51</i>	<i>1.59</i>	<i>1.86</i>		<i>1.70</i>	<i>1.67</i>
								Base	<i>1.94</i>	<i>1.94</i>	<i>1.70</i>	<i>1.77</i>	<i>2.08</i>	1.69	<i>1.78</i>	<i>1.88</i>
								High	<i>2.08</i>	<i>2.18</i>	<i>1.81</i>	<i>1.86</i>	<i>2.25</i>		<i>1.82</i>	<i>2.03</i>
Petroleum Products																
Gasoline ^b (dollars per gallon)93	.96	.99	.97	.96	1.13	1.11	Low	<i>1.04</i>	<i>1.00</i>	<i>1.02</i>	<i>1.04</i>	<i>.96</i>		<i>1.06</i>	<i>1.01</i>
								Base	<i>1.06</i>	<i>1.08</i>	<i>1.11</i>	<i>1.13</i>	<i>1.05</i>	.96	<i>1.06</i>	<i>1.09</i>
								High	<i>1.08</i>	<i>1.14</i>	<i>1.19</i>	<i>1.21</i>	<i>1.13</i>		<i>1.07</i>	<i>1.17</i>
No. 2 Diesel Oil, Retail (dollars per gallon)93	.93	.90	.89	.94	.99	.95	Low	<i>.94</i>	<i>.94</i>	<i>.92</i>	<i>.92</i>	<i>.93</i>		<i>.96</i>	<i>.93</i>
								Base	<i>.97</i>	<i>.98</i>	<i>.96</i>	<i>.96</i>	<i>.97</i>	.91	<i>.96</i>	<i>.97</i>
								High	<i>.99</i>	<i>1.01</i>	<i>1.00</i>	<i>.99</i>	<i>1.00</i>		<i>.97</i>	<i>1.00</i>
No. 2 Heating Oil, Wholesale (dollars per gallon)50	.49	.44	.46	.53	.53	.52	Low	<i>.50</i>	<i>.48</i>	<i>.46</i>	<i>.46</i>	<i>.49</i>		<i>.52</i>	<i>.47</i>
								Base	<i>.57</i>	<i>.55</i>	<i>.52</i>	<i>.52</i>	<i>.56</i>	.47	<i>.54</i>	<i>.54</i>
								High	<i>.63</i>	<i>.62</i>	<i>.59</i>	<i>.59</i>	<i>.63</i>		<i>.55</i>	<i>.61</i>
No. 2 Heating Oil, Retail (dollars per gallon)84	.82	.75	.78	.86	.86	.83	Low	<i>.82</i>	<i>.82</i>	<i>.79</i>	<i>.76</i>	<i>.80</i>		<i>.84</i>	<i>.80</i>
								Base	<i>.88</i>	<i>.91</i>	<i>.87</i>	<i>.84</i>	<i>.89</i>	.81	<i>.86</i>	<i>.88</i>
								High	<i>.93</i>	<i>.98</i>	<i>.95</i>	<i>.92</i>	<i>.97</i>		<i>.87</i>	<i>.96</i>
No. 6 Residual Fuel Oil ^c (dollars per barrel)	14.76	13.94	13.67	13.67	15.11	17.08	16.37	Low	<i>15.08</i>	<i>15.02</i>	<i>14.19</i>	<i>14.39</i>	<i>14.79</i>		<i>15.82</i>	<i>14.64</i>
								Base	<i>16.96</i>	<i>17.37</i>	<i>16.42</i>	<i>16.64</i>	<i>17.11</i>	14.04	<i>16.29</i>	<i>16.93</i>
								High	<i>18.86</i>	<i>19.73</i>	<i>18.66</i>	<i>18.91</i>	<i>19.43</i>		<i>16.72</i>	<i>19.23</i>
Electric Utility Fuels																
Coal (dollars per million Btu)	1.48	1.49	1.45	1.44	1.44	1.45	1.48	Low	<i>1.47</i>	<i>1.48</i>	<i>1.51</i>	<i>1.50</i>	<i>1.51</i>		<i>1.46</i>	<i>1.50</i>
								Base	<i>1.49</i>	<i>1.51</i>	<i>1.55</i>	<i>1.54</i>	<i>1.55</i>	1.47	<i>1.47</i>	<i>1.54</i>
								High	<i>1.52</i>	<i>1.55</i>	<i>1.60</i>	<i>1.59</i>	<i>1.60</i>		<i>1.47</i>	<i>1.58</i>
Heavy Oil ^d (dollars per million Btu)	2.53	2.37	2.36	2.39	2.62	2.94	2.77	Low	<i>2.59</i>	<i>2.58</i>	<i>2.41</i>	<i>2.45</i>	<i>2.54</i>		<i>2.71</i>	<i>2.50</i>
								Base	<i>2.88</i>	<i>2.96</i>	<i>2.76</i>	<i>2.81</i>	<i>2.91</i>	2.40	<i>2.78</i>	<i>2.86</i>
								High	<i>3.18</i>	<i>3.34</i>	<i>3.12</i>	<i>3.18</i>	<i>3.29</i>		<i>2.84</i>	<i>3.23</i>
Natural Gas (dollars per million Btu)	2.40	2.08	2.24	2.43	2.38	2.30	2.31	Low	<i>2.35</i>	<i>2.42</i>	<i>2.16</i>	<i>2.16</i>	<i>2.37</i>		<i>2.33</i>	<i>2.26</i>
								Base	<i>2.52</i>	<i>2.66</i>	<i>2.38</i>	<i>2.38</i>	<i>2.61</i>	2.26	<i>2.36</i>	<i>2.49</i>
								High	<i>2.69</i>	<i>2.95</i>	<i>2.63</i>	<i>2.59</i>	<i>2.86</i>		<i>2.39</i>	<i>2.74</i>
Other Residential																
Natural Gas (dollars per thousand cubic feet)	5.11	5.73	6.82	5.55	5.41	5.83	6.85	Low	<i>5.50</i>	<i>5.32</i>	<i>5.83</i>	<i>6.78</i>	<i>5.63</i>		<i>5.62</i>	<i>5.60</i>
								Base	<i>5.63</i>	<i>5.51</i>	<i>6.05</i>	<i>7.04</i>	<i>5.85</i>	5.47	<i>5.66</i>	<i>5.81</i>
								High	<i>5.74</i>	<i>5.71</i>	<i>6.29</i>	<i>7.29</i>	<i>6.05</i>		<i>5.69</i>	<i>6.03</i>
Electricity (cents per kilowatthour)	7.00	7.59	7.91	7.47	7.19	7.77	8.03	Low	<i>7.54</i>	<i>7.23</i>	<i>7.80</i>	<i>8.12</i>	<i>7.72</i>		<i>7.63</i>	<i>7.72</i>
								Base	<i>7.62</i>	<i>7.36</i>	<i>7.96</i>	<i>8.31</i>	<i>7.93</i>	7.49	<i>7.65</i>	<i>7.88</i>
								High	<i>7.70</i>	<i>7.49</i>	<i>8.11</i>	<i>8.47</i>	<i>8.12</i>		<i>7.67</i>	<i>8.04</i>

^a Cost of imported crude oil to U.S. refiners.

^b Average retail for all grades and services.

^c Retail residual fuel oil--average, all sulfur contents.

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

Notes: Third 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(89/07); and *Petroleum Marketing Monthly*, DOE/EIA-0380(89/07).

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
Supply															
Crude Oil Supply															
Domestic Production ^a	8.33	8.23	8.01	8.00	7.78	7.74	<i>7.57</i>	<i>7.58</i>	<i>7.54</i>	<i>7.38</i>	<i>7.30</i>	<i>7.28</i>	8.14	<i>7.67</i>	<i>7.37</i>
Alaska	2.05	2.01	2.00	2.01	1.87	1.91	<i>1.83</i>	<i>1.90</i>	<i>1.87</i>	<i>1.83</i>	<i>1.81</i>	<i>1.83</i>	2.02	<i>1.87</i>	<i>1.84</i>
Lower 48	6.28	6.22	6.01	5.98	5.92	5.83	<i>5.74</i>	<i>5.69</i>	<i>5.66</i>	<i>5.55</i>	<i>5.48</i>	<i>5.45</i>	6.12	<i>5.79</i>	<i>5.54</i>
Net Imports (Including SPR) ^b	4.54	5.15	4.98	5.14	5.09	5.60	<i>6.23</i>	<i>5.81</i>	<i>5.52</i>	<i>5.63</i>	<i>6.43</i>	<i>6.17</i>	4.95	<i>5.69</i>	<i>5.94</i>
Gross Imports (Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.71	<i>6.32</i>	<i>5.92</i>	<i>5.65</i>	<i>5.75</i>	<i>6.53</i>	<i>6.29</i>	5.06	<i>5.79</i>	<i>6.06</i>
SPR Imports05	.06	.05	.05	.07	.06	<i>.06</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	.05	<i>.06</i>	<i>.05</i>
Exports19	.13	.15	.15	.17	.17	<i>.14</i>	<i>.16</i>	<i>.18</i>	<i>.17</i>	<i>.15</i>	<i>.16</i>	.15	<i>.16</i>	<i>.17</i>
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	<i>-.06</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	-.05	<i>-.06</i>	<i>-.05</i>
Other Stock Withdrawn or Added (-)	-.06	-.05	.33	-.02	.04	-.05	<i>-.04</i>	<i>.01</i>	<i>-.06</i>	<i>-.01</i>	<i>.06</i>	<i>.00</i>	.05	<i>-.01</i>	<i>.00</i>
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.02	<i>-.02</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	<i>-.05</i>	-.04	<i>-.03</i>	<i>-.05</i>
Unaccounted-for Crude15	.12	.31	.20	.23	.21	<i>.15</i>	<i>.13</i>	<i>.15</i>	<i>.14</i>	<i>.12</i>	<i>.13</i>	.20	<i>.18</i>	<i>.14</i>
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.41	<i>13.83</i>	<i>13.44</i>	<i>13.04</i>	<i>13.04</i>	<i>13.81</i>	<i>13.49</i>	13.25	<i>13.43</i>	<i>13.35</i>
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.60	<i>1.53</i>	<i>1.63</i>	<i>1.64</i>	<i>1.61</i>	<i>1.59</i>	<i>1.63</i>	1.62	<i>1.60</i>	<i>1.62</i>
Other Hydrocarbon and Alcohol Inputs05	.04	.06	.06	.05	.05	<i>.07</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	.05	<i>.06</i>	<i>.06</i>
Crude Oil Product Supplied05	.04	.03	.04	.05	.02	<i>.02</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	<i>.05</i>	.04	<i>.03</i>	<i>.05</i>
Processing Gain66	.65	.64	.67	.65	.63	<i>.66</i>	<i>.66</i>	<i>.65</i>	<i>.66</i>	<i>.69</i>	<i>.67</i>	.66	<i>.65</i>	<i>.67</i>
Net Product Imports ^c	1.72	1.37	1.64	1.80	1.85	1.40	<i>1.26</i>	<i>1.51</i>	<i>1.72</i>	<i>1.67</i>	<i>1.56</i>	<i>1.72</i>	1.63	<i>1.51</i>	<i>1.67</i>
Gross Product Imports ^c	2.40	2.05	2.26	2.47	2.52	2.09	<i>1.99</i>	<i>2.10</i>	<i>2.31</i>	<i>2.23</i>	<i>2.08</i>	<i>2.31</i>	2.30	<i>2.17</i>	<i>2.23</i>
Product Exports67	.68	.62	.67	.66	.69	<i>.73</i>	<i>.59</i>	<i>.59</i>	<i>.56</i>	<i>.52</i>	<i>.59</i>	.66	<i>.67</i>	<i>.56</i>
Product Stock Withdrawn or Added (-) ^d63	-.47	-.46	.41	.34	-.31	<i>-.47</i>	<i>.35</i>	<i>.54</i>	<i>-.25</i>	<i>-.47</i>	<i>.20</i>	.03	<i>-.03</i>	<i>.00</i>
Total Product Supplied, Domestic Use	17.59	16.60	17.08	17.86	17.61	16.81	<i>16.89</i>	<i>17.69</i>	<i>17.69</i>	<i>16.84</i>	<i>17.29</i>	<i>17.82</i>	17.28	<i>17.25</i>	<i>17.41</i>
Disposition															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.46	<i>7.47</i>	<i>7.36</i>	<i>7.05</i>	<i>7.59</i>	<i>7.58</i>	<i>7.41</i>	7.34	<i>7.34</i>	<i>7.41</i>
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.40	<i>1.49</i>	<i>1.53</i>	<i>1.53</i>	<i>1.43</i>	<i>1.50</i>	<i>1.53</i>	1.45	<i>1.48</i>	<i>1.50</i>
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.98	<i>2.83</i>	<i>3.30</i>	<i>3.56</i>	<i>2.96</i>	<i>2.81</i>	<i>3.35</i>	3.12	<i>3.12</i>	<i>3.17</i>
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.24	<i>1.12</i>	<i>1.28</i>	<i>1.39</i>	<i>1.03</i>	<i>1.10</i>	<i>1.24</i>	1.38	<i>1.31</i>	<i>1.19</i>
Other Oils Supplied ^e	3.92	3.75	4.15	4.18	4.06	3.75	<i>3.97</i>	<i>4.22</i>	<i>4.15</i>	<i>3.84</i>	<i>4.29</i>	<i>4.29</i>	4.00	<i>4.00</i>	<i>4.14</i>
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.81	<i>16.89</i>	<i>17.69</i>	<i>17.69</i>	<i>16.84</i>	<i>17.29</i>	<i>17.82</i>	17.28	<i>17.25</i>	<i>17.41</i>
Total Petroleum Net Imports	6.26	6.52	6.62	6.94	6.95	7.01	<i>7.50</i>	<i>7.31</i>	<i>7.24</i>	<i>7.31</i>	<i>7.98</i>	<i>7.89</i>	6.59	<i>7.19</i>	<i>7.61</i>
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	354	359	329	330	326	331	<i>335</i>	<i>334</i>	<i>339</i>	<i>340</i>	<i>335</i>	<i>335</i>	330	<i>334</i>	<i>335</i>
Total Motor Gasoline	232	210	221	228	230	217	<i>223</i>	<i>229</i>	<i>234</i>	<i>216</i>	<i>224</i>	<i>229</i>	228	<i>229</i>	<i>229</i>
Finished Motor Gasoline	194	175	183	190	199	178	<i>183</i>	<i>191</i>	<i>196</i>	<i>180</i>	<i>186</i>	<i>192</i>	190	<i>191</i>	<i>192</i>
Blending Components	37	35	39	39	41	38	<i>40</i>	<i>38</i>	<i>38</i>	<i>36</i>	<i>38</i>	<i>37</i>	39	<i>38</i>	<i>37</i>
Jet Fuel	46	46	47	44	44	45	<i>48</i>	<i>46</i>	<i>46</i>	<i>47</i>	<i>48</i>	<i>45</i>	44	<i>46</i>	<i>45</i>
Distillate Fuel Oil	90	110	131	124	97	99	<i>122</i>	<i>130</i>	<i>91</i>	<i>100</i>	<i>130</i>	<i>132</i>	124	<i>130</i>	<i>132</i>
Residual Fuel Oil	44	42	45	45	42	45	<i>48</i>	<i>45</i>	<i>41</i>	<i>41</i>	<i>42</i>	<i>45</i>	45	<i>45</i>	<i>45</i>
Other Oils ^g	249	295	301	267	264	300	<i>308</i>	<i>267</i>	<i>256</i>	<i>286</i>	<i>290</i>	<i>265</i>	267	<i>267</i>	<i>265</i>
Total Stocks (Excluding SPR)	1014	1062	1074	1038	1003	1036	<i>1083</i>	<i>1050</i>	<i>1007</i>	<i>1031</i>	<i>1068</i>	<i>1050</i>	1038	<i>1050</i>	<i>1050</i>
Crude Oil in SPR	545	550	555	560	566	572	<i>577</i>	<i>582</i>	<i>586</i>	<i>591</i>	<i>595</i>	<i>600</i>	560	<i>582</i>	<i>600</i>
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1608	<i>1661</i>	<i>1632</i>	<i>1593</i>	<i>1621</i>	<i>1664</i>	<i>1650</i>	1597	<i>1632</i>	<i>1650</i>

^a Includes lease condensate.
^b Net imports equals gross imports plus SPR imports minus exports.
^c Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.
^d Includes an estimate of minor product stock change based on monthly data.
^e 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.
^f Includes crude oil in transit to refineries.
^g 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 Aug. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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

Sensitivity	1989	1990				Year	
	4th	1st	2nd	3rd	4th	1989	1990
Base Case	<i>17.69</i>	<i>17.69</i>	<i>16.84</i>	<i>17.29</i>	<i>17.82</i>	<i>17.25</i>	<i>17.41</i>
Price							
Low	<i>.02</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	<i>.07</i>	<i>.01</i>	<i>.05</i>
High	<i>-.01</i>	<i>-.03</i>	<i>-.04</i>	<i>-.05</i>	<i>-.06</i>	<i>.00</i>	<i>-.04</i>
Weather							
Adverse	<i>.27</i>	<i>.30</i>	<i>.11</i>	<i>.07</i>	<i>.28</i>	<i>.06</i>	<i>.19</i>
Favorable	<i>-.22</i>	<i>-.26</i>	<i>-.09</i>	<i>-.06</i>	<i>-.22</i>	<i>-.05</i>	<i>-.16</i>
Economic							
High Activity	<i>.13</i>	<i>.23</i>	<i>.24</i>	<i>.25</i>	<i>.27</i>	<i>.04</i>	<i>.25</i>
Low Activity	<i>-.13</i>	<i>-.24</i>	<i>-.26</i>	<i>-.25</i>	<i>-.27</i>	<i>-.04</i>	<i>-.26</i>
Range of Projected Demand							
High	<i>18.11</i>	<i>18.26</i>	<i>17.24</i>	<i>17.66</i>	<i>18.44</i>	<i>17.36</i>	<i>17.90</i>
Low	<i>17.33</i>	<i>17.16</i>	<i>16.45</i>	<i>16.93</i>	<i>17.27</i>	<i>17.16</i>	<i>16.95</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
Supply															
Crude Oil Supply															
Domestic Production ^a	8.33	8.23	8.01	8.00	7.78	7.74	7.57	7.51	7.42	7.25	7.14	7.11	8.14	7.65	7.23
Alaska	2.05	2.01	2.00	2.01	1.87	1.91	1.83	1.90	1.86	1.81	1.79	1.79	2.02	1.87	1.81
Lower 48	6.28	6.22	6.01	5.98	5.92	5.83	5.74	5.61	5.56	5.44	5.36	5.31	6.12	5.77	5.42
Net Imports (Including SPR) ^b	4.54	5.15	4.98	5.14	5.09	5.60	6.23	6.13	5.91	5.98	6.87	6.70	4.95	5.77	6.37
Gross Imports															
(Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.71	6.32	6.24	6.04	6.11	6.97	6.81	5.06	5.87	6.49
SPR Imports	.05	.06	.05	.05	.07	.06	.06	.05	.05	.05	.05	.05	.05	.06	.05
Exports	.19	.13	.15	.15	.17	.17	.14	.16	.18	.17	.15	.16	.15	.16	.17
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.05	-.05	-.05	-.05	-.05	-.05	-.06	-.05
Other Stock Withdrawn or Added (-)	-.06	-.05	-.33	-.02	.04	-.05	-.04	-.07	-.06	.02	.05	-.03	.05	-.03	-.01
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.02	-.02	-.05	-.05	-.05	-.05	-.05	-.04	-.03	-.05
Unaccounted-for Crude	.15	.12	.31	.20	.23	.21	.15	.15	.14	.13	.13	.14	.20	.18	.14
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.41	13.83	13.61	13.32	13.28	14.08	13.82	13.25	13.48	13.63
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.60	1.53	1.63	1.64	1.61	1.59	1.64	1.62	1.60	1.62
Other Hydrocarbon and Alcohol Inputs	.05	.04	.06	.06	.05	.05	.07	.06	.06	.06	.06	.06	.05	.06	.06
Crude Oil Product Supplied	.05	.04	.03	.04	.05	.02	.02	.05	.05	.05	.05	.05	.04	.03	.05
Processing Gain	.66	.65	.64	.67	.65	.63	.66	.68	.66	.67	.70	.70	.66	.66	.68
Net Product Imports ^c	1.72	1.37	1.64	1.80	1.85	1.40	1.26	1.90	1.96	1.85	1.64	2.00	1.63	1.60	1.86
Gross Product Imports ^c	2.40	2.05	2.26	2.47	2.52	2.09	1.99	2.49	2.55	2.41	2.16	2.59	2.30	2.27	2.43
Product Exports	.67	.68	.62	.67	.66	.69	.73	.59	.59	.56	.52	.59	.66	.67	.56
Product Stock Withdrawn or Added (-) ^d	.63	-.47	-.46	.41	.34	-.31	-.47	.17	.57	-.28	-.47	.17	.03	-.07	-.01
Total Product Supplied,															
Domestic Use	17.59	16.60	17.08	17.86	17.61	16.81	16.89	18.11	18.26	17.24	17.66	18.44	17.28	17.36	17.90
Disposition															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.46	7.47	7.38	7.09	7.64	7.64	7.49	7.34	7.35	7.47
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.40	1.49	1.54	1.56	1.47	1.55	1.58	1.45	1.48	1.54
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.98	2.83	3.47	3.78	3.08	2.90	3.56	3.12	3.16	3.33
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.24	1.12	1.41	1.54	1.14	1.21	1.39	1.38	1.34	1.32
Other Oils Supplied ^e	3.92	3.75	4.15	4.18	4.06	3.75	3.97	4.31	4.29	3.91	4.35	4.42	4.00	4.02	4.24
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.81	16.89	18.11	18.26	17.24	17.66	18.44	17.28	17.36	17.90
Total Petroleum Net Imports	6.26	6.52	6.62	6.94	6.95	7.01	7.50	8.03	7.87	7.83	8.50	8.70	6.59	7.37	8.23
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	354	359	329	330	326	331	335	341	346	345	340	343	330	341	343
Total Motor Gasoline	232	210	221	228	230	217	223	229	234	221	227	230	228	229	230
Finished Motor Gasoline	194	175	183	190	189	178	183	191	195	184	188	193	190	191	193
Blending Components	37	35	39	39	41	38	40	38	39	37	39	38	39	38	38
Jet Fuel	46	46	47	44	44	45	48	48	46	49	50	47	44	48	47
Distillate Fuel Oil	90	110	131	124	97	99	122	132	92	101	131	134	124	132	134
Residual Fuel Oil	44	42	45	45	42	45	48	49	45	43	46	49	45	49	49
Other Oils ^g	249	295	301	267	264	300	308	275	265	293	297	274	267	275	274
Total Stocks (Excluding SPR)	1014	1062	1074	1038	1003	1036	1083	1074	1028	1052	1091	1078	1038	1074	1078
Crude Oil in SPR	545	550	555	560	566	572	577	582	586	591	595	600	560	582	600
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1608	1661	1656	1614	1643	1686	1678	1597	1656	1678

^a Includes lease condensate.

^b Net imports equals gross imports plus SPR imports minus exports.

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

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

^e 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.

^f Includes crude oil in transit to refineries.

^g 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 Aug. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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
Supply															
Crude Oil Supply															
Domestic Production ^a	8.33	8.23	8.01	8.00	7.78	7.74	7.57	7.67	7.67	7.53	7.47	7.47	8.14	7.69	7.53
Alaska	2.05	2.01	2.00	2.01	1.87	1.91	1.83	1.90	1.88	1.84	1.84	1.86	2.02	1.87	1.85
Lower 48	6.28	6.22	6.01	5.98	5.92	5.83	5.74	5.77	5.79	5.69	5.63	5.61	6.12	5.81	5.68
Net Imports (Including SPR) ^b	4.54	5.15	4.98	5.14	5.09	5.60	6.23	5.47	5.10	5.27	5.99	5.63	4.95	5.60	5.50
Gross Imports															
(Excluding SPR)	4.68	5.22	5.08	5.23	5.18	5.71	6.32	5.59	5.23	5.39	6.09	5.75	5.06	5.70	5.62
SPR Imports	.05	.06	.05	.05	.07	.06	.06	.05	.05	.05	.05	.05	.05	.06	.05
Exports	.19	.13	.15	.15	.17	.17	.14	.16	.18	.17	.15	.16	.15	.16	.17
SPR Stock Withdrawn or Added (-)	-.05	-.06	-.05	-.05	-.07	-.06	-.06	-.05	-.05	-.05	-.05	-.05	-.05	-.06	-.05
Other Stock Withdrawn or Added (-)	-.06	-.05	.33	-.02	.04	-.05	-.04	.12	-.04	-.04	.06	.04	.05	.02	.00
Products Supplied and Losses	-.05	-.04	-.03	-.04	-.05	-.02	-.02	-.05	-.05	-.05	-.05	-.05	-.04	-.03	-.05
Unaccounted-for Crude	.15	.12	.31	.20	.23	.21	.15	.12	.14	.14	.13	.13	.20	.18	.14
Crude Oil Input to Refineries	12.86	13.35	13.55	13.22	13.03	13.41	13.83	13.28	12.77	12.80	13.54	13.17	13.25	13.39	13.07
Other Supply															
NGL Production	1.61	1.62	1.62	1.65	1.64	1.60	1.53	1.62	1.62	1.60	1.59	1.62	1.62	1.59	1.61
Other Hydrocarbon and Alcohol Inputs	.05	.04	.06	.06	.05	.05	.07	.06	.06	.06	.06	.06	.05	.06	.06
Crude Oil Product Supplied	.05	.04	.03	.04	.05	.02	.02	.05	.05	.05	.05	.05	.04	.03	.05
Processing Gain	.66	.65	.64	.67	.65	.63	.66	.64	.62	.64	.67	.65	.66	.64	.65
Net Product Imports ^c	1.72	1.37	1.64	1.80	1.85	1.40	1.26	1.14	1.52	1.60	1.43	1.47	1.63	1.41	1.51
Gross Product Imports ^c	2.40	2.05	2.26	2.47	2.52	2.09	1.99	1.73	2.11	2.16	1.95	2.06	2.30	2.08	2.07
Product Exports	.67	.68	.62	.67	.66	.69	.73	.59	.59	.56	.52	.59	.66	.67	.56
Product Stock Withdrawn or Added (-) ^d	.63	-.47	-.46	.41	.34	-.31	-.47	.54	.52	-.31	-.41	.24	.03	.02	.01
Total Product Supplied, Domestic Use	17.59	16.60	17.08	17.86	17.61	16.81	16.89	17.33	17.16	16.45	16.93	17.27	17.28	17.16	16.95
Disposition															
Motor Gasoline	7.02	7.51	7.48	7.33	7.08	7.46	7.47	7.34	7.01	7.53	7.52	7.34	7.34	7.34	7.35
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.40	1.49	1.51	1.51	1.39	1.46	1.48	1.45	1.47	1.46
Distillate Fuel Oil	3.55	2.84	2.78	3.32	3.38	2.98	2.83	3.15	3.37	2.84	2.73	3.17	3.12	3.08	3.03
Residual Fuel Oil	1.61	1.11	1.26	1.53	1.60	1.24	1.12	1.17	1.26	.93	.99	1.11	1.38	1.28	1.07
Other Oils Supplied ^e	3.92	3.75	4.15	4.18	4.06	3.75	3.97	4.14	4.01	3.75	4.23	4.16	4.00	3.98	4.04
Total Product Supplied	17.59	16.60	17.08	17.86	17.62	16.81	16.89	17.33	17.16	16.45	16.93	17.27	17.28	17.16	16.95
Total Petroleum Net Imports	6.26	6.52	6.62	6.94	6.95	7.01	7.50	6.62	6.62	6.87	7.42	7.11	6.59	7.02	7.00
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	354	359	329	330	326	331	335	324	328	332	326	323	330	324	323
Total Motor Gasoline	232	210	221	228	230	217	223	227	230	213	221	226	228	227	226
Finished Motor Gasoline	194	175	183	190	189	178	183	189	193	179	184	189	190	189	189
Blending Components	37	35	39	39	41	38	40	38	37	34	37	37	39	38	37
Jet Fuel	46	46	47	44	44	45	48	46	44	46	47	44	44	46	44
Distillate Fuel Oil	90	110	131	124	97	99	122	127	92	103	128	129	124	127	129
Residual Fuel Oil	44	42	45	45	42	45	48	41	37	38	38	40	45	41	40
Other Oils ^g	249	295	301	267	264	300	308	259	249	280	284	256	267	259	256
Total Stocks (Excluding SPR)	1014	1062	1074	1038	1003	1036	1083	1023	980	1012	1044	1019	1038	1023	1019
Crude Oil in SPR	545	550	555	560	566	572	577	582	586	591	595	600	560	582	600
Total Stocks (Including SPR)	1559	1612	1628	1597	1569	1608	1661	1605	1566	1602	1640	1619	1597	1605	1619

^a Includes lease condensate.

^b Net imports equals gross imports plus SPR imports minus exports.

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

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

^e 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.

^f Includes crude oil in transit to refineries.

^g 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 Aug. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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
Supply															
Domestic Production ^a	6.73	6.91	7.11	7.07	6.74	7.01	<i>7.21</i>	<i>7.09</i>	<i>6.77</i>	<i>6.99</i>	<i>7.23</i>	<i>7.10</i>	6.96	<i>7.01</i>	<i>7.02</i>
Imports37	.42	.47	.36	.37	.37	<i>.37</i>	<i>.38</i>	<i>.35</i>	<i>.44</i>	<i>.42</i>	<i>.39</i>	.41	<i>.37</i>	<i>.40</i>
Exports01	.03	.01	.02	.03	.05	<i>.05</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	<i>.01</i>	.02	<i>.04</i>	<i>.01</i>
Net Imports35	.39	.46	.33	.34	.33	<i>.32</i>	<i>.36</i>	<i>.34</i>	<i>.42</i>	<i>.41</i>	<i>.38</i>	.38	<i>.34</i>	<i>.39</i>
Net Withdrawals	-.06	.21	-.08	-.08	.01	.12	<i>-.05</i>	<i>-.09</i>	<i>-.05</i>	<i>.17</i>	<i>-.06</i>	<i>-.06</i>	.00	<i>.00</i>	<i>.00</i>
Total Primary Supply	7.02	7.51	7.48	7.33	7.08	7.46	<i>7.47</i>	<i>7.36</i>	<i>7.05</i>	<i>7.59</i>	<i>7.58</i>	<i>7.41</i>	7.34	<i>7.35</i>	<i>7.41</i>
Disposition															
Leaded	1.39	1.45	1.32	1.21	1.00	.92	<i>.76</i>	<i>.99</i>	<i>.91</i>	<i>.94</i>	<i>.90</i>	<i>.84</i>	1.34	<i>.92</i>	<i>.90</i>
Unleaded	5.63	6.06	6.16	6.12	6.08	6.54	<i>6.72</i>	<i>6.37</i>	<i>6.14</i>	<i>6.65</i>	<i>6.68</i>	<i>6.57</i>	6.00	<i>6.43</i>	<i>6.51</i>
Total Product Supplied	7.02	7.51	7.48	7.33	7.08	7.46	<i>7.47</i>	<i>7.36</i>	<i>7.05</i>	<i>7.59</i>	<i>7.58</i>	<i>7.41</i>	7.34	<i>7.34</i>	<i>7.41</i>
Stocks															
Primary Finished Stock Levels ^b (million barrels)															
Opening	188.8	194.4	174.9	182.7	189.9	189.0	<i>178.4</i>	<i>182.9</i>	<i>190.8</i>	<i>195.6</i>	<i>180.1</i>	<i>185.7</i>	188.8	<i>189.9</i>	<i>190.8</i>
Closing	194.4	174.9	182.7	189.9	189.0	178.4	<i>182.9</i>	<i>190.8</i>	<i>195.6</i>	<i>180.1</i>	<i>185.7</i>	<i>191.6</i>	189.9	<i>190.8</i>	<i>191.6</i>

^a Refinery Production plus production at natural gas processing plants.

^b 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 Aug. 1989; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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
Supply															
Refinery Output	2.80	2.90	2.80	2.93	2.83	2.78	<i>2.92</i>	<i>3.05</i>	<i>2.86</i>	<i>2.77</i>	<i>2.88</i>	<i>3.04</i>	2.86	<i>2.90</i>	<i>2.89</i>
Imports35	.23	.27	.36	.37	.27	<i>.26</i>	<i>.40</i>	<i>.36</i>	<i>.35</i>	<i>.32</i>	<i>.40</i>	.30	<i>.33</i>	<i>.36</i>
Exports09	.06	.07	.06	.11	.05	<i>.11</i>	<i>.07</i>	<i>.09</i>	<i>.06</i>	<i>.07</i>	<i>.07</i>	.07	<i>.08</i>	<i>.07</i>
Net Imports26	.16	.20	.30	.25	.23	<i>.16</i>	<i>.33</i>	<i>.27</i>	<i>.29</i>	<i>.25</i>	<i>.33</i>	.23	<i>.24</i>	<i>.29</i>
Net Withdrawals49	-.23	-.23	.09	.30	-.03	<i>-.24</i>	<i>-.09</i>	<i>.43</i>	<i>-.10</i>	<i>-.32</i>	<i>-.02</i>	.03	<i>-.02</i>	<i>-.01</i>
Disposition															
Electric Utility Consumption05	.04	.07	.05	.08	.05	<i>.06</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	.05	<i>.06</i>	<i>.05</i>
Utility Stock Additions	-.01	.00	.00	.00	-.02	.01	<i>-.01</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	<i>.00</i>	.00	<i>.00</i>	<i>.00</i>
Electric Utility Shipments04	.04	.07	.04	.06	.06	<i>.05</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.05</i>	<i>.05</i>	.05	<i>.06</i>	<i>.05</i>
Nonutility Shipments	3.51	2.80	2.71	3.28	3.32	2.91	<i>2.78</i>	<i>3.25</i>	<i>3.52</i>	<i>2.92</i>	<i>2.76</i>	<i>3.30</i>	3.07	<i>3.06</i>	<i>3.12</i>
Total Product Supplied	3.55	2.84	2.78	3.32	3.38	2.98	<i>2.83</i>	<i>3.30</i>	<i>3.56</i>	<i>2.96</i>	<i>2.81</i>	<i>3.35</i>	3.12	<i>3.12</i>	<i>3.17</i>
Stocks															
Electric Utility Stock Levels (million barrels)															
Opening	15.8	15.2	15.3	15.5	15.1	13.4	<i>14.6</i>	<i>14.1</i>	<i>14.0</i>	<i>14.0</i>	<i>13.8</i>	<i>13.7</i>	15.8	<i>15.1</i>	<i>14.0</i>
Closing	15.2	15.3	15.5	15.1	13.4	14.6	<i>14.1</i>	<i>14.0</i>	<i>14.0</i>	<i>13.8</i>	<i>13.7</i>	<i>13.6</i>	15.1	<i>14.0</i>	<i>13.6</i>
Primary Stock Levels (million barrels)															
Opening	134.5	89.8	110.4	131.5	123.5	96.6	<i>99.4</i>	<i>121.7</i>	<i>129.6</i>	<i>90.9</i>	<i>100.0</i>	<i>129.8</i>	134.5	<i>123.5</i>	<i>129.6</i>
Closing	89.8	110.4	131.5	123.5	96.6	99.4	<i>121.7</i>	<i>129.6</i>	<i>90.9</i>	<i>100.0</i>	<i>129.8</i>	<i>131.6</i>	123.5	<i>129.6</i>	<i>131.6</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 Aug. 1989; *Monthly Energy Review*, DOE/EIA-0035(89/07); *Electric Power Monthly*, DOE/EIA-0226(89/07); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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
Supply															
Refinery Output	0.98	0.90	0.88	0.95	0.94	0.93	<i>0.87</i>	<i>0.93</i>	<i>0.92</i>	<i>0.79</i>	<i>0.89</i>	<i>0.92</i>	0.93	<i>0.92</i>	<i>0.88</i>
Imports78	.42	.58	.79	.81	.57	<i>.49</i>	<i>.52</i>	<i>.62</i>	<i>.43</i>	<i>.38</i>	<i>.56</i>	.64	<i>.60</i>	<i>.50</i>
Exports19	.23	.18	.20	.17	.24	<i>.20</i>	<i>.20</i>	<i>.20</i>	<i>.19</i>	<i>.16</i>	<i>.20</i>	.20	<i>.21</i>	<i>.19</i>
Net Imports59	.19	.41	.59	.64	.33	<i>.28</i>	<i>.32</i>	<i>.43</i>	<i>.24</i>	<i>.22</i>	<i>.36</i>	.44	<i>.39</i>	<i>.31</i>
Net Withdrawals04	.02	-.03	.00	.02	-.03	<i>-.04</i>	<i>.04</i>	<i>.04</i>	<i>.00</i>	<i>-.01</i>	<i>-.03</i>	.01	<i>.00</i>	<i>.00</i>
Disposition															
Electric Utility Consumption64	.41	.67	.79	.84	.58	<i>.55</i>	<i>.58</i>	<i>.52</i>	<i>.50</i>	<i>.60</i>	<i>.59</i>	.63	<i>.64</i>	<i>.55</i>
Utility Stock Additions	-.03	.01	.01	.00	-.10	.07	<i>.00</i>	<i>.01</i>	<i>.00</i>	<i>-.01</i>	<i>.00</i>	<i>.01</i>	.00	<i>.00</i>	<i>.00</i>
Electric Utility Shipments60	.43	.68	.78	.74	.65	<i>.55</i>	<i>.60</i>	<i>.52</i>	<i>.48</i>	<i>.60</i>	<i>.61</i>	.62	<i>.63</i>	<i>.55</i>
Nonutility Shipments	1.01	.68	.58	.75	.87	.58	<i>.58</i>	<i>.68</i>	<i>.86</i>	<i>.54</i>	<i>.49</i>	<i>.64</i>	.75	<i>.68</i>	<i>.63</i>
Total Product Supplied	1.61	1.11	1.26	1.53	1.60	1.24	<i>1.12</i>	<i>1.28</i>	<i>1.39</i>	<i>1.03</i>	<i>1.10</i>	<i>1.24</i>	1.38	<i>1.31</i>	<i>1.19</i>
Stocks															
Electric Utility Stock Levels (million barrels)															
Opening	55.1	52.2	53.5	54.6	54.2	45.1	<i>51.9</i>	<i>51.7</i>	<i>52.8</i>	<i>52.8</i>	<i>51.5</i>	<i>51.8</i>	55.1	<i>54.2</i>	<i>52.8</i>
Closing	52.2	53.5	54.6	54.2	45.1	51.9	<i>51.7</i>	<i>52.8</i>	<i>52.8</i>	<i>51.5</i>	<i>51.8</i>	<i>53.1</i>	54.2	<i>52.8</i>	<i>53.1</i>
Primary Stock Levels (million barrels)															
Opening	47.4	43.7	42.2	44.6	44.6	42.4	<i>44.8</i>	<i>48.1</i>	<i>44.7</i>	<i>40.9</i>	<i>40.8</i>	<i>41.6</i>	47.4	<i>44.6</i>	<i>44.7</i>
Closing	43.7	42.2	44.6	44.6	42.4	44.8	<i>48.1</i>	<i>44.7</i>	<i>40.9</i>	<i>40.8</i>	<i>41.6</i>	<i>44.6</i>	44.6	<i>44.7</i>	<i>44.6</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 Aug. 1989; *Monthly Energy Review*, DOE/EIA-0035(89/07); *Electric Power Monthly*, DOE/EIA-0226(89/07); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

Table 13. Supply and Disposition of Other Petroleum Products:^a 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
Supply															
Net Refinery Output ^b	3.02	3.29	3.40	2.94	3.18	3.32	<i>3.49</i>	<i>3.03</i>	<i>3.14</i>	<i>3.15</i>	<i>3.50</i>	<i>3.10</i>	3.16	<i>3.26</i>	<i>3.22</i>
Natural Gas Plant Output	1.60	1.62	1.62	1.65	1.64	1.60	<i>1.53</i>	<i>1.63</i>	<i>1.64</i>	<i>1.61</i>	<i>1.59</i>	<i>1.63</i>	1.62	<i>1.60</i>	<i>1.62</i>
Other Domestic ^c05	.04	.06	.06	.05	.05	<i>.07</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	<i>.06</i>	.05	<i>.06</i>	<i>.06</i>
Net Imports52	.63	.57	.58	.62	.52	<i>.51</i>	<i>.50</i>	<i>.69</i>	<i>.72</i>	<i>.67</i>	<i>.65</i>	.57	<i>.54</i>	<i>.68</i>
Net Withdrawals16	-.47	-.12	.40	.01	-.37	<i>-.15</i>	<i>.48</i>	<i>.12</i>	<i>-.32</i>	<i>-.08</i>	<i>.32</i>	-.01	<i>-.01</i>	<i>.01</i>
Total Primary Supply	5.36	5.10	5.54	5.63	5.50	5.12	<i>5.44</i>	<i>5.70</i>	<i>5.64</i>	<i>5.21</i>	<i>5.75</i>	<i>5.76</i>	5.41	<i>5.44</i>	<i>5.59</i>
Disposition															
Jet Fuel	1.49	1.39	1.42	1.49	1.50	1.40	<i>1.49</i>	<i>1.53</i>	<i>1.53</i>	<i>1.43</i>	<i>1.50</i>	<i>1.53</i>	1.45	<i>1.48</i>	<i>1.50</i>
Liquefied Petroleum Gas ^d	1.91	1.33	1.53	1.85	1.97	1.42	<i>1.47</i>	<i>1.93</i>	<i>2.01</i>	<i>1.44</i>	<i>1.65</i>	<i>1.99</i>	1.66	<i>1.70</i>	<i>1.77</i>
Petrochemical Feedstocks ^e46	.47	.46	.45	.48	.45	<i>.45</i>	<i>.45</i>	<i>.49</i>	<i>.47</i>	<i>.48</i>	<i>.44</i>	.46	<i>.46</i>	<i>.47</i>
Miscellaneous ^f	1.51	1.91	2.12	1.84	1.57	1.85	<i>2.04</i>	<i>1.79</i>	<i>1.61</i>	<i>1.89</i>	<i>2.11</i>	<i>1.81</i>	1.84	<i>1.81</i>	<i>1.85</i>
Total Product Supplied	5.36	5.10	5.54	5.63	5.52	5.12	<i>5.44</i>	<i>5.70</i>	<i>5.64</i>	<i>5.21</i>	<i>5.75</i>	<i>5.76</i>	5.41	<i>5.45</i>	<i>5.59</i>
Stocks															
Primary Stocks (million barrels)															
Opening	347.1	332.3	375.4	386.5	349.4	348.9	<i>382.4</i>	<i>395.8</i>	<i>351.4</i>	<i>340.1</i>	<i>369.4</i>	<i>376.5</i>	347.1	<i>349.4</i>	<i>351.4</i>
Closing	332.3	375.4	386.5	349.4	348.9	382.4	<i>395.8</i>	<i>351.4</i>	<i>340.1</i>	<i>369.4</i>	<i>376.5</i>	<i>347.2</i>	349.4	<i>351.4</i>	<i>347.2</i>

^a 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.

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

^c Field production of other hydrocarbons and alcohol.

^d Includes ethane, propane, normal butane, and isobutane.

^e Includes naphthas and other oils designated for petrochemical feedstock use.

^f 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 September 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 Aug. 1989; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-41).

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
Supply															
Total Dry Gas Production ^a	4.51	4.11	4.02	4.35	4.39	4.11	<i>4.02</i>	<i>4.39</i>	<i>4.51</i>	<i>4.20</i>	<i>4.07</i>	<i>4.46</i>	16.99	<i>16.91</i>	<i>17.25</i>
Net Imports35	.27	.27	.33	.33	.31	<i>.29</i>	<i>.34</i>	<i>.40</i>	<i>.35</i>	<i>.32</i>	<i>.36</i>	1.22	<i>1.26</i>	<i>1.43</i>
Supplemental Gaseous Fuels03	.02	.02	.03	.05	.04	<i>.03</i>	<i>.05</i>	<i>.05</i>	<i>.04</i>	<i>.04</i>	<i>.05</i>	.10	<i>.16</i>	<i>.18</i>
Total New Supply	4.90	4.40	4.31	4.71	4.76	4.46	<i>4.34</i>	<i>4.78</i>	<i>4.96</i>	<i>4.60</i>	<i>4.42</i>	<i>4.87</i>	18.31	<i>18.33</i>	<i>18.86</i>
Underground Working Gas Storage															
Opening	2.76	1.68	2.29	3.12	2.85	1.78	<i>2.37</i>	<i>3.09</i>	<i>2.72</i>	<i>1.68</i>	<i>2.26</i>	<i>3.08</i>	2.76	<i>2.85</i>	<i>2.72</i>
Closing	1.68	2.29	3.12	2.85	1.78	2.37	<i>3.09</i>	<i>2.72</i>	<i>1.68</i>	<i>2.26</i>	<i>3.08</i>	<i>2.71</i>	2.85	<i>2.72</i>	<i>2.71</i>
Net Withdrawals ^b	1.11	-.56	-.76	.27	1.09	-.58	<i>-.84</i>	<i>.37</i>	<i>1.04</i>	<i>-.58</i>	<i>-.82</i>	<i>.37</i>	.06	<i>.04</i>	<i>.01</i>
Total Primary Supply ^a	6.01	3.84	3.55	4.98	5.85	3.88	<i>3.50</i>	<i>5.14</i>	<i>6.00</i>	<i>4.02</i>	<i>3.61</i>	<i>5.24</i>	18.37	<i>18.37</i>	<i>18.86</i>
Consumption															
Lease and Plant Fuel29	.27	.26	.28	.31	.29	<i>.27</i>	<i>.29</i>	<i>.31</i>	<i>.29</i>	<i>.27</i>	<i>.30</i>	1.09	<i>1.15</i>	<i>1.17</i>
Pipeline Use17	.14	.15	.16	.15	.13	<i>.15</i>	<i>.16</i>	<i>.17</i>	<i>.16</i>	<i>.15</i>	<i>.17</i>	.61	<i>.59</i>	<i>.65</i>
Residential	2.21	.81	.36	1.25	2.18	.85	<i>.37</i>	<i>1.23</i>	<i>2.32</i>	<i>.84</i>	<i>.37</i>	<i>1.24</i>	4.63	<i>4.64</i>	<i>4.78</i>
Commercial	1.17	.49	.32	.69	1.11	.52	<i>.32</i>	<i>.66</i>	<i>1.16</i>	<i>.51</i>	<i>.33</i>	<i>.66</i>	2.67	<i>2.62</i>	<i>2.66</i>
Industrial	1.82	1.46	1.45	1.66	1.79	1.66	<i>1.56</i>	<i>1.69</i>	<i>1.81</i>	<i>1.69</i>	<i>1.56</i>	<i>1.74</i>	6.38	<i>6.69</i>	<i>6.80</i>
Electric Utilities54	.72	.91	.47	.53	.74	<i>.85</i>	<i>.54</i>	<i>.55</i>	<i>.64</i>	<i>.85</i>	<i>.56</i>	2.63	<i>2.66</i>	<i>2.60</i>
Subtotal	6.20	3.88	3.43	4.51	6.06	4.19	<i>3.52</i>	<i>4.57</i>	<i>6.32</i>	<i>4.13</i>	<i>3.53</i>	<i>4.67</i>	18.03	<i>18.34</i>	<i>18.66</i>
Total Disposition	6.01	3.84	3.55	4.98	5.85	3.88	<i>3.50</i>	<i>5.14</i>	<i>6.00</i>	<i>4.02</i>	<i>3.61</i>	<i>5.24</i>	18.37	<i>18.37</i>	<i>18.86</i>
Unaccounted for	-.20	-.04	.12	.47	-.21	-.31	<i>-.02</i>	<i>.57</i>	<i>-.32</i>	<i>-.11</i>	<i>.07</i>	<i>.57</i>	.34	<i>.03</i>	<i>.20</i>

^a Excludes nonhydrocarbon gases removed.

^b 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(89/07); *Natural Gas Monthly*, DOE/EIA-0130(89/07); and *Electric Power Monthly*, DOE/EIA-0226(89/07).

**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
Supply															
Production	237	227	241	245	247	239	237	250	245	249	240	253	950	973	987
Primary Stock Levels ^a															
Opening	28	37	36	31	30	35	30	29	29	28	27	27	28	30	29
Closing	37	36	31	30	35	30	29	29	28	27	27	27	30	29	27
Net Withdrawals	-8	1	5	1	-5	5	1	0	1	1	0	0	-2	1	2
Imports	1	1	0	1	1	1	1	1	0	1	1	1	2	2	2
Exports	16	25	28	26	21	28	24	24	20	25	25	25	95	97	95
Total New Domestic Supply	213	203	219	220	221	216	216	227	226	226	216	229	855	880	897
Secondary Stock Levels ^b															
Opening	185	175	173	154	158	149	159	142	149	153	170	148	185	158	149
Closing	175	173	154	158	149	159	142	149	153	170	148	152	158	149	152
Net Withdrawals	10	2	19	-4	9	-10	16	-6	-4	-17	22	-4	27	9	-4
Total Indicated Consumption	223	205	238	216	230	206	<i>232</i>	<i>220</i>	<i>222</i>	<i>209</i>	<i>238</i>	<i>225</i>	882	<i>889</i>	<i>893</i>
Consumption															
Coke Plants	10	11	10	11	11	11	10	11	11	11	10	10	42	42	41
Electric Utilities	188	176	208	186	191	178	202	188	190	179	208	192	758	759	769
Retail and General Industry ^c	22	19	20	22	22	19	20	22	22	19	20	22	83	83	83
Subtotal	221	205	239	218	223	208	232	220	222	209	238	225	883	884	893
Total Disposition	223	205	238	216	230	206	<i>232</i>	<i>220</i>	<i>222</i>	<i>209</i>	<i>238</i>	<i>225</i>	882	<i>889</i>	<i>893</i>
Discrepancy ^d	2	0	-1	-2	7	-1	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	-1	5	0

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

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

^c Includes consumption at coal gasification plants of 6.7 million tons for 1988. Synfuels plant consumption is assumed to be 1.7 million tons per quarter in 1989 and 1990.

^d 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(89/07); and *Quarterly Coal Report*, DOE/EIA-0121(89/2Q).

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
Net Utility Generation															
Coal	383.6	356.0	420.5	378.2	388.4	362.7	<i>401.0</i>	<i>379.9</i>	<i>385.4</i>	<i>364.0</i>	<i>421.3</i>	<i>389.8</i>	1538.2	<i>1532.0</i>	<i>1560.6</i>
Petroleum	37.6	24.4	40.1	46.6	49.4	34.1	<i>32.9</i>	<i>34.6</i>	<i>30.4</i>	<i>29.3</i>	<i>35.6</i>	<i>35.1</i>	148.8	<i>151.0</i>	<i>130.5</i>
Natural Gas	52.5	69.2	86.2	44.9	50.3	70.6	<i>80.9</i>	<i>52.0</i>	<i>52.5</i>	<i>61.1</i>	<i>81.5</i>	<i>54.0</i>	252.8	<i>253.9</i>	<i>249.1</i>
Nuclear Power	130.8	124.8	145.1	126.2	124.7	114.8	<i>147.4</i>	<i>134.2</i>	<i>141.4</i>	<i>127.6</i>	<i>144.4</i>	<i>136.3</i>	526.9	<i>521.1</i>	<i>549.6</i>
Hydropower	60.7	59.2	49.6	53.5	61.2	78.0	<i>64.5</i>	<i>67.0</i>	<i>77.6</i>	<i>81.0</i>	<i>66.8</i>	<i>67.5</i>	222.9	<i>270.7</i>	<i>292.9</i>
Geothermal Power and Other ^a	3.0	2.9	3.1	3.0	2.8	2.8	<i>3.1</i>	<i>3.1</i>	<i>3.1</i>	<i>3.1</i>	<i>3.3</i>	<i>3.3</i>	12.0	<i>11.8</i>	<i>12.7</i>
Total Utility Generation	668.1	636.5	744.7	652.3	676.8	663.0	<i>729.8</i>	<i>670.8</i>	<i>690.4</i>	<i>666.0</i>	<i>752.8</i>	<i>686.1</i>	2701.6	<i>2740.4</i>	<i>2795.3</i>
Net Imports	9.6	7.3	9.5	5.4	3.5	6.5	<i>8.3</i>	<i>7.7</i>	<i>3.6</i>	<i>6.9</i>	<i>8.7</i>	<i>8.1</i>	31.8	<i>25.9</i>	<i>27.4</i>
Purchases from Nonutilities ^b	<i>17.3</i>	<i>16.6</i>	<i>18.3</i>	<i>16.7</i>	<i>18.6</i>	<i>18.0</i>	<i>19.8</i>	<i>18.1</i>	<i>21.9</i>	<i>21.2</i>	<i>23.3</i>	<i>21.3</i>	<i>68.8</i>	<i>74.4</i>	<i>87.7</i>
Total Supply	<i>695.0</i>	<i>660.4</i>	<i>772.5</i>	<i>674.4</i>	<i>698.9</i>	<i>687.5</i>	<i>757.8</i>	<i>696.6</i>	<i>716.0</i>	<i>694.1</i>	<i>784.9</i>	<i>715.5</i>	<i>2802.2</i>	<i>2840.8</i>	<i>2910.4</i>
Losses and Unaccounted For ^c	<i>50.8</i>	<i>66.1</i>	<i>63.1</i>	<i>55.9</i>	<i>44.9</i>	<i>66.1</i>	<i>56.3</i>	<i>62.0</i>	<i>41.6</i>	<i>59.5</i>	<i>59.1</i>	<i>61.2</i>	<i>236.0</i>	<i>229.2</i>	<i>221.4</i>
Utility Sales	644.2	594.2	709.4	618.4	654.0	621.4	<i>701.5</i>	<i>634.6</i>	<i>674.4</i>	<i>634.6</i>	<i>725.7</i>	<i>654.3</i>	2566.2	<i>2611.6</i>	<i>2689.0</i>

^a Includes wind, wood, waste, photovoltaic, and solar.

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

^c 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(89/07); and *Electric Power Monthly*, DOE/EIA-0226(89/07).

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