

SHORT-TERM ENERGY OUTLOOK

QUARTERLY PROJECTIONS

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Released for Printing: May 1, 1990

The *Short-Term Energy Outlook* (ISSN 0743-0604) is published quarterly by the Energy Information Administration, 1000 Independence Avenue, SW, Washington, DC 20585, and sells for \$14.00 per year (price subject to change without advance notice). Second-class postage paid at Washington, DC 20066-9998, and additional mailing offices. POSTMASTER: Send address changes to *Short-Term Energy Outlook*, Energy Information Administration, EI-231, 1000 Independence Avenue, SW, Washington, DC 20585.

Short-Term Energy Outlook

Quarterly Projections

April 1990

Energy Information Administration
Office of Energy Markets and End Use
U.S. Department of Energy
Washington, DC 20585

This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or reflecting any policy position of the Department of Energy or of any other organization.

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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 1991.

The forecasts are produced using the Short-Term Integrated Forecasting System (STIFS). The STIFS model is driven principally by the following sets of assumptions or inputs: forecasts of key macroeconomic variables, a particular set of world oil price assumptions, and assumptions about the severity of weather. Macroeconomic forecasts are produced by DRI/McGraw-Hill, but are adjusted by EIA to reflect EIA assumptions about the world price of crude oil, energy product prices, and other assumptions which may affect the macroeconomic outlook. 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 with high, middle, and low crude oil price trajectories, respectively, and various weather scenarios. The extreme weather cases are designed to replicate, quarter by quarter, the most severe weather conditions witnessed since 1975. 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 estimated effect of price, macroeconomic conditions, and weather on petroleum demand.

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 any rounded numbers cited in the text.

Contents

Highlights	2
Assumptions	
International Petroleum	6
World Oil Prices	8
Energy Product Prices	9
Macroeconomic Activity	11
U.S. Petroleum Outlook	
Petroleum Demand	14
Petroleum Supply	15
Motor Gasoline	17
Distillate Fuel Oil	18
Residual Fuel Oil	18
Other Petroleum Products	19
Jet Fuel	20
Outlook for Other Major Energy Sources	
Natural Gas	22
Coal	22
Electricity	23
Special Topics	
Summer Outlook for Motor Gasoline	29
Natural Gas Futures Market	30
References	31
Detailed Tables	33

Tables

1.	Summary of Base Case Assumptions and Projections	3
2.	International Petroleum Balance	34
3.	International Economic Growth	34
4.	Macroeconomic, Oil Price, and Weather Assumptions	35
5.	Energy Product Prices	36
6.	Supply and Disposition of Petroleum: Base Case	37
7.	Petroleum Demand Sensitivities	38
8.	Supply and Disposition of Petroleum: High Demand Case	39
9.	Supply and Disposition of Petroleum: Low Demand Case	40
10.	Supply and Disposition of Motor Gasoline: Base Case	41
11.	Supply and Disposition of Distillate Fuel Oil: Base Case	42
12.	Supply and Disposition of Residual Fuel Oil: Base Case	43
13.	Supply and Disposition of Other Petroleum Products: Base Case	44
14.	Supply and Disposition of Natural Gas	45
15.	Supply and Disposition of Coal	46
16.	Supply and Disposition of Electricity	47

Figures

1.	OPEC Oil Production and Production Capacity	7
2.	World Oil Prices	8
3.	Crude Oil and Retail Product Prices	9
4.	Utility Oil and Gas Prices	10
5.	Real Residential Electricity Prices	11
6.	Real GNP Growth	11
7.	Key Economic Indicators	12
8.	Total Petroleum Demand	14
9.	Petroleum Imports and Production	16
10.	Motor Gasoline Market Shares by Grade and Demand Components	17
11.	Distillate Fuel Oil Demand	18
12.	Residual Fuel Oil Demand	19
13.	Jet Fuel Product Supplied	20
14.	Annual Change in Natural Gas Demand	22
15.	Coal Consumption	23
16.	Electricity Sales Growth	24
17.	Annual Change in Electricity Generation by Fuel Source	25

Highlights

Highlights

It appears that petroleum demand in the United States will decline this year, averaging about 90,000 barrels per day less than in 1989 (Table 1). Extremely mild temperatures during the first 3 months of this year have led to some distortion in the normal seasonality of the domestic oil market. Given the extraordinarily cold weather in December 1989, prospects for a milder fourth quarter this year are excellent and would contribute further to the weakness in 1990 petroleum demand. Some segments of the petroleum market are likely to remain steady in 1990, but an overall increase in petroleum demand is not probable until 1991. Next year, economic growth is expected to rebound, and weather is assumed to return to normal. The result will be an increase in domestic petroleum demand of at least a quarter of a million barrels per day. Despite a temporary slump in the market for petroleum products this year, oil imports may increase by over 500,000 barrels per day in 1990, as domestic oil production continues to decline. Primary inventories for some key products were at relatively low levels at the end of last year. Thus, a net inventory buildup is likely for the year as a whole, and the pressure on imports will increase. Although declines in domestic oil production are expected to moderate slightly in 1991, oil imports may continue increasing at the pace set in 1990 to keep up with additional demand.

Weak Demand and an Improved Inventory Picture Caused Oil Prices to Fall Recently

Prices for imported crude oil delivered to refiners exceeded \$20 per barrel in January, an increase of more than \$3 per barrel since August. The very mild temperatures in the first quarter of this year contributed to the year-to-date decline in petroleum consumption. The weak demand and the currently much-improved stock situation have caused oil prices to decline recently. Oil prices are expected to vary within the range of \$16 to \$22 per barrel through 1991.

Domestic Crude Oil Production Continues Downward in 1990 and 1991

Domestic crude oil production is expected to decline by 370,000 barrels per day this year and by an additional 300,000 barrels per day in 1991. Continued declines in Alaskan production are projected through 1991. Production in the Lower 48 States is expected to fall by an average of 235,000 barrels per day for 1990 and 1991. The resulting level of domestic oil production is below 7.3 million barrels per day this year and below 7.0 million barrels per day in 1991.

Net Oil Imports Could Increase by 500,000 Barrels per Day in 1990

U.S. net imports of crude oil (including the Strategic Petroleum Reserve) and petroleum products are expected to average 7.6 million barrels per day in 1990, an increase of 500,000 barrels per day over 1989 levels. This reflects the impact of reduced domestic production and stock replenishment.

Electricity Demand Should Remain Strong Through 1991

Despite milder weather during the first quarter of this year, growth in total electricity sales should average 2.7 percent in 1990. This rate reflects a slight drop in industrial sector growth this year due to a slowdown in the economy. The effects of mild weather during key periods in 1989 appear to yield strong growth this year in the residential and commercial sectors, particularly during the summer months. Growth in electricity demand in 1991 is expected to be a rather robust 3.8 percent, as demand accelerates in the industrial sector and combines with continued strength in the residential and commercial sectors.

Coal Production Could Exceed 1 Billion Tons Next Year

Coal demand is expected to increase by 2.1 percent this year and by 3.6 percent in 1991. As a result, coal production is expected to exceed 1 billion tons in 1991. Continued growth in the demand for electricity is the driving force behind these expectations.

Table 1. Summary of Base Case Assumptions and Projections

Assumptions and Projections	Year				Annual Percentage Change		
	1988	1989	1990	1991	1988-1989	1989-1990	1990-1991
Macroeconomic Indicators							
Real Gross National Product (billion 1982 dollars)	4,024	4,144	4,220	4,327	3.0	1.8	2.5
Index of Industrial Production (Mfg.) (index, 1977 = 1.000)	1.427	1.481	1.506	1.554	3.8	1.6	3.2
Imported Crude Oil Price (nominal dollars per barrel)	14.56	18.08	19.20	19.50	24.2	6.2	1.6
Retail Prices (nominal) *							
Motor Gasoline ^b (dollars per gallon)96	1.06	1.13	1.15	10.4	6.6	1.8
No. 2 Heating Oil (dollars per gallon)81	.90	.97	.97	11.1	7.8	.0
Residential Natural Gas (dollars per thousand cubic feet)	5.47	5.63	5.96	6.33	2.9	5.9	6.2
Residential Electricity (cents per kilowatthour)	7.48	7.64	7.89	8.10	2.1	3.3	2.7
Petroleum Supply							
Crude Oil Production ^c (million barrels per day)	8.14	7.63	7.26	6.96	-6.3	-4.8	-4.1
Net Petroleum Imports, Including SPR (million barrels per day)	6.59	7.12	7.62	8.11	8.0	7.0	6.4
Energy Demands							
Total Market Economies Petroleum Consumption (million barrels per day)	50.84	52.07	53.06	54.51	2.4	1.9	2.7
Total U.S. Petroleum Consumption (million barrels per day)	17.28	17.24	17.15	17.44	-2	-.5	1.7
Motor Gasoline	7.34	7.33	7.33	7.36	-.1	.0	.4
Jet Fuel	1.45	1.49	1.50	1.54	2.8	.7	2.7
Distillate Fuel Oil	3.12	3.15	3.08	3.21	1.0	-2.2	4.2
Residual Fuel Oil	1.38	1.35	1.28	1.25	-2.2	-5.2	-2.3
Other Petroleum ^d	4.00	3.93	3.97	4.09	-1.8	1.0	3.0
Natural Gas Consumption (trillion cubic feet)	18.03	18.95	18.81	19.42	5.1	-.7	3.2
Coal Consumption (million short tons)	884	889	908	941	.6	2.1	3.6
Electricity Sales ^e (billion kilowatthours)	2,567.9	2,633.8	2,705.0	2,808.4	2.6	2.7	3.8
Gross Energy Consumption ^f (quadrillion Btu)	80.20	81.28	81.69	83.68	1.3	.5	2.4
Thousand Btu/1982 Dollar of GNP	19.93	19.61	19.36	19.34	-1.6	-1.3	-.1

* 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 Total annual electricity sales for historical periods are derived from the sum of monthly sales figures based on submissions by electric utilities of Form EIA-826, "Monthly Electric Utility Sales and Revenue Report with State Distributions". These historical values differ from annual sales totals based on Form EIA-861, reported in several EIA publications, but match alternate annual totals reported in EIA's *Electric Power Monthly*, DOE/EIA-0226(90/01).

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

SPR: Strategic Petroleum Reserve

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

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01); *International Petroleum Statistics Report*, DOE/EIA-0520(90/04); *International Energy Annual 1988*, DOE/EIA-0219(88); *Petroleum Marketing Monthly*, DOE/EIA-0380(90/01); *Petroleum Supply Monthly*, DOE/EIA-0109(90/01); *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/1; *Natural Gas Monthly*, DOE/EIA-0130(90/01); *Electric Power Monthly*, DOE/EIA-0226(90/01); and *Quarterly Coal Report*, DOE/EIA-0121(89/4Q); Organization for Economic Cooperation and Development, *Monthly Oil Statistics Database* through September 1989. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0390.

Assumptions

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

International Petroleum

Recent Developments

The current uncertainty of world crude oil prices in the near term is understandable considering the recent volatility of prices, the large number of potentially contradictory supply and demand trends currently facing the oil market, and the imperfect knowledge of recent data for some critical components in the oil market equation. The volatility of world crude oil prices during 1989 and over the last 4 months can be illustrated using two price series. The refiner acquisition cost of crude oil imported into the United States, which averaged \$16.00 per barrel in January 1989, increased to \$19.60 by April, declined to \$17.20 in August and then increased to \$20.00 in December.¹ Then, in January 1990 this price increased to \$20.50, its highest level since January 1986. Recent data on spot prices of OPEC crude oils indicate a recent downward slide in world oil prices. The OPEC spot prices, which had ranged from about \$18.00 to \$22.50 per barrel on January 5, 1990, decreased to a range of \$12.00 to \$16.50 on April 20, 1990.²

What will happen to world crude oil prices over the next year and one-half? To answer this question, the individual trends for a whole set of supply and demand components must be projected and then brought together in a coordinated market balance. Currently, there is much uncertainty about the future trends for some of these components. In addition, revised historical data, some of it based on very preliminary estimates, have provided a somewhat different view of past trends for some demand and supply components, and an indication that the oil market was more balanced in 1988 and 1989 than previously indicated.

On the demand side, the major uncertainty is whether, and to what extent, economic growth will slow in the OECD countries, especially in 1990, and how this will affect growth in oil consumption, particularly in the United States, Japan, and OECD Europe. Current EIA analysis indicates that OECD oil demand in 1988 was about 37.0 million barrels per day, an increase of 80,000 barrels per day over the estimate in the last *Outlook*.

Most analysts expect slower growth in petroleum demand by the Other Market Economies in 1990, but there is still considerable uncertainty over the actual level of demand and the rate of growth in 1989. EIA currently estimates, based on very preliminary data, that oil consumption by the Other Market Economies in 1989 may have exceeded 14.6 million barrels per day, an increase of 230,000 barrels per day from the estimate reported in the last *Outlook* (Table 2). The new 1989 estimate also represents an increase of 820,000 barrels per day, or 5.9 percent, from EIA's revised estimate for 1988.

On the supply side of the oil market, one of the key uncertainties is what levels of production OPEC will choose to produce over the forecast period. Will they choose to reduce production from the high rate attained in the first quarter of 1990? What will they decide at their June Ministerial Conference concerning a production ceiling and reference price for the second half of 1990? Obviously, the answers to these questions will be affected by the demand issues discussed and by non-OPEC supply issues.

The key uncertainties underlying the expected trend for oil supplies from the non-OPEC Market Economies are the decline rate of U.S. oil production and the duration and extent of the production losses in the United Kingdom sector of the North Sea due to the extensive maintenance operations planned during the summer and fall of 1990. These uncertainties are compounded by the large uncertainty surrounding future trends in net oil exports from the Centrally Planned Economies (CPE) to the Market Economies. The future level of these exports will be determined by a complex and interrelated set of highly uncertain trends, the most important of which include: (1) the decline rate of Soviet oil production; (2) the magnitude and direction of oil demand in the Soviet Union, Eastern Europe, and China; (3) the split of Soviet oil exports between Centrally Planned and Market Economies; and (4) the ability of East European

countries to finance oil purchases from non-Soviet oil producers. EIA has revised its estimates of net oil exports from CPE's for 1988 and 1989 based on preliminary estimates of oil production and oil demand in these countries. EIA currently estimates that net CPE oil exports in 1988 were almost 2.3 million barrels per day, a decrease of 210,000 barrels per day from the previous estimate. Likewise, the 1989 estimate was reduced by 340,000 barrels per day to a rate of about 2.0 million barrels per day.

Forecast

The demand for petroleum products by the Market Economies is expected to increase to an average of 53.1 million barrels per day in 1990, 1.0 million barrels per day, or 1.9 percent, from the 1989 rate (Table 2). In 1991, demand is expected to increase by more than 1.4 million barrels per day, or 2.7 percent.

Petroleum demand by the OECD countries is expected to increase to an average of almost 37.8 million barrels per day in 1990, about 350,000 barrels per day, or 0.9 percent, from the 1989 rate. This increase is based on the assumption that the OECD economies will grow at a 2.7-percent rate in 1990 (Table 3). Growth in Japan and OECD Europe is expected to account for a significant share of this increase. In 1991, as OECD economic growth increases to 2.8 percent, OECD petroleum demand is expected to increase by about 750,000 barrels per day, or 2.0 percent. The United States is expected to account for almost two-fifths of this increase in demand, while Japan and OECD Europe are each expected to account for about one-fourth.

Petroleum demand in the Other Market Economies is expected to continue to grow rapidly in both 1990 and 1991, accounting for two-thirds of the growth in demand by the Market Economies in 1990 and for almost one-half in 1991. In 1990, petroleum demand by the Other Market Economies is expected to average more than 15.3 million barrels per day, an increase of 660,000 barrels per day, or 4.5 percent, from the 1989 rate. In 1991, petroleum demand is expected to increase by 700,000 barrels per day, or by 4.6 percent.

OPEC oil production (including crude oil, natural gas liquids, and refinery gain) in 1990 is expected to average 25.0 million barrels per day, or 1.26 million barrels per day above the rate for 1989. In 1991, OPEC oil production is expected to increase by another 500,000 barrels per day. It is currently expected that OPEC oil production capacity will average about 30.0 million barrels per day in 1990, or 600,000 barrels per day above the rate estimated for 1989. In 1991, OPEC oil production capacity is expected to increase marginally to 30.2 million barrels per day. As a result, OPEC excess oil production capacity is expected to average roughly 5 million barrels per day in both 1990 and 1991 (Figure 1). (The expected OPEC excess capacity for any quarter of the year may differ significantly from the annual average. The range of variation of OPEC excess capacity estimates becomes even wider when a range of possible aggregate OPEC oil production levels is projected, based on a range of inventory behavior.)

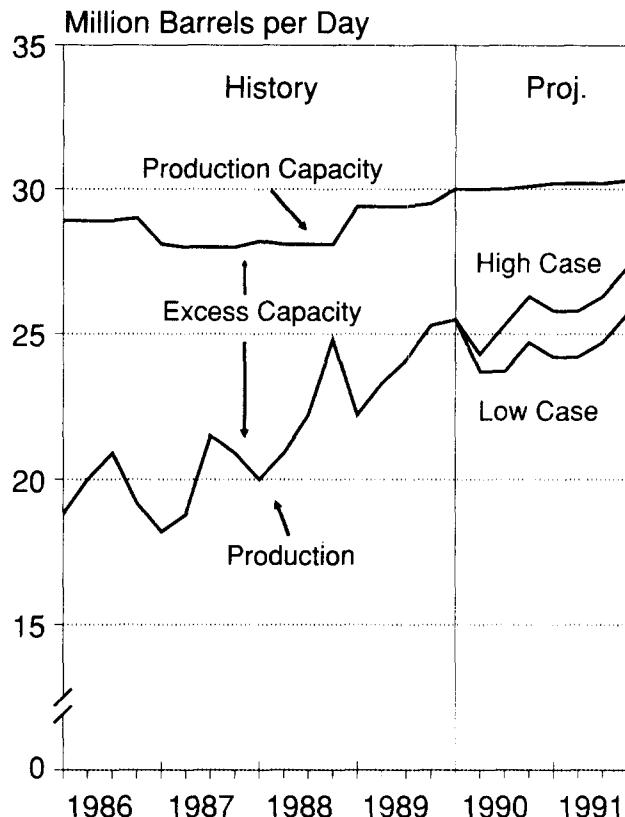


Figure 1. OPEC Oil Production and Production Capacity

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.

Oil production from the non-OPEC Market Economies is expected to increase by about 270,000 barrels per day in 1990 and by about 440,000 barrels per day in 1991. In 1990, significant production increases from Norway (165,000 barrels per day), the United Kingdom (145,000 barrels per day), Brazil (65,000 barrels per day), Australia/New Zealand (60,000 barrels per day), and Syria (50,000 barrels per day) will more than offset the decrease from the United States of 330,000 barrels per day.³ In 1991, the United States is projected to decrease production by 280,000 barrels per day, easily offset by increases from the United Kingdom (245,000 barrels per day), Norway (210,000 barrels per day), South Yemen (60,000 barrels per day), Brazil (50,000 barrels per day), and Colombia (50,000 barrels per day). (These comparisons refer to Table 2, which uses a different definition of oil production than Table 6. See footnote "a" in Table 2.)

Net oil exports from Centrally Planned Economies (CPE) to the Market Economies are expected to decrease throughout the forecast period, declining by 280,000 barrels per day to 1.7 million barrels per day in 1990 and by an additional 90,000 barrels per day in 1991. The decline in 1990 is based on the expected decline in Soviet oil production of 0.5 million barrels per day, partially offset by a decline in total CPE oil demand of 180,000 barrels per day and an increase in non-Soviet CPE oil production of 40,000 barrels per day.⁴ In 1991, Soviet oil production is expected to decline by 300,000 barrels per day, with a largely offsetting decline in total CPE oil demand of 150,000 barrels per day and an increase in non-Soviet CPE oil production of 60,000 barrels per day.

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 alternative projections for domestic supply and demand (Table 4).

In the base oil price scenario, the world oil price decreases from about \$19.70 per barrel in the first quarter of 1990 to \$18.00 in the second quarter (even lower prices occurred in April), and then increases to \$19.00 in the third quarter and to \$20.00 in the fourth quarter. In 1991, the price remains at \$20.00 in the first quarter, decreases to \$19.00 in the second and third quarters, and then returns to \$20.00 in the fourth quarter. This scenario is based on the assumption that the OPEC member countries will significantly reduce their oil production in the second and third quarters of 1990 and will continue to show more production restraint for the remainder of the forecast period. In addition, it is assumed that oil refiners will be willing to hold higher-than-normal stocks of both crude oil and refined products because of increased concern over temporary losses of non-OPEC crude oil supplies and refinery capacity. In particular, it is assumed that refiners will hold high levels of stocks during the spring and summer of 1990

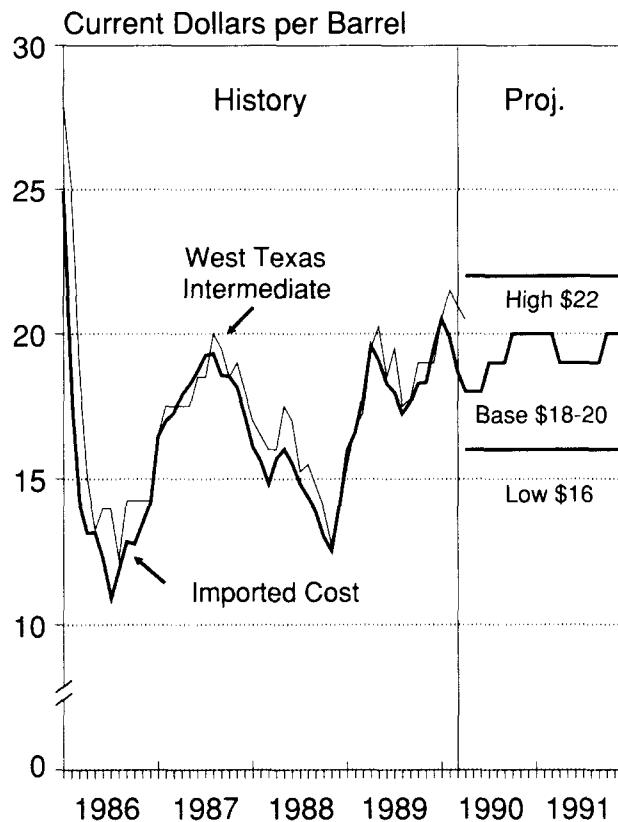


Figure 2. World Oil Prices

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(90/01) (Washington, DC, 1990); and *Oil and Gas Journal Energy Database* (Tulsa, OK, January 1990).

Projections: Table 4.

because of fears that the extensive maintenance shutdowns in the United Kingdom sector of the North Sea, planned for July through October, may last longer and result in larger losses of production than current plans would indicate.

In the low oil price scenario, the world oil price decreases to \$16.00 per barrel in the second quarter of 1990 and remains at that level throughout the forecast period. In this scenario, it is assumed that some OPEC member countries, including Kuwait and the United Arab Emirates, will continue to exceed their production quotas, leading to higher OPEC oil production than in the base scenario. In addition, it is assumed that an even less robust picture emerges for economic growth than in the base case, lowering the growth rate of oil consumption in both the OECD countries and in the Other Market Economies. Finally, it is assumed that oil supplies from non-OPEC producers, including net oil exports from the Centrally Planned Economies (CPE) to the Market Economies, will exceed the rates expected in the base scenario.

In the high oil price scenario, the world oil price increases to \$22.00 per barrel in the second quarter of 1990 and remains at that level throughout the forecast period. In this scenario, it is assumed that economic growth will be higher than in the base scenario, leading to significantly higher growth in oil consumption. At the same time, it is assumed that oil production from the United Kingdom and the United States and net oil exports from the CPE to the Market Economies will fall below the rates expected in the base scenario. Finally, it is assumed that the OPEC member nations will agree in June 1990 to increase their minimum reference price and will defend that price by restricting their oil production when necessary.

Energy Product Prices

Overview

Most petroleum product prices jumped between November 1989 and January 1990 when extremely cold weather caused demand for heating fuels to soar (Figure 3). Wholesale and retail prices for jet fuel and minor petroleum products increased noticeably, as distributors and consumers scrambled to obtain supplies in anticipation of refiners' increased production of heating oil at the expense of producing these other products. At the end of the cold snap, prices for most of these products dropped sharply. A reversal in weather patterns to extremely mild temperatures in the Eastern half of the Nation lessened demand for heating oil considerably, allowed for quick inventory replenishment for all products, and lessened pressure on markets in general.

Most energy product prices are expected to drift upward in the forecast period (Table 5), responding to the expected increase in the price of crude oil and inflation. Natural gas prices are expected to increase faster than petroleum product prices between 1990 and 1991, as supplies are expected to begin to tighten.

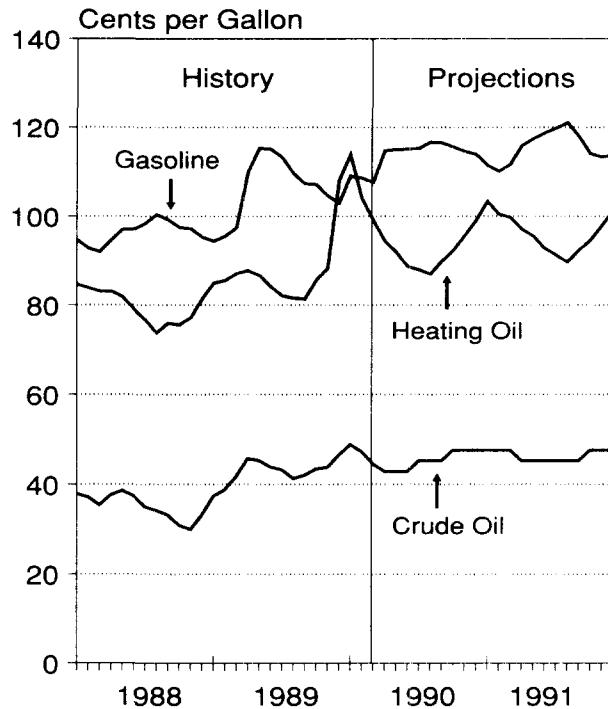


Figure 3. Crude Oil and Retail Product Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) (Washington, DC, 1990). **Projections:** Table 5.

Retail Motor Gasoline

In 1989, motor gasoline prices climbed steadily throughout most of the year, dropping somewhat during the last quarter. This pattern reflects primarily the behavior of crude oil prices. Crude oil prices have been relatively stable since the end of last spring and, despite recent downward pressure toward the \$16.00 per barrel range, are projected to continue on a relatively flat path through 1991. As a result, retail gasoline prices should follow a relatively stable seasonal pattern, barring disruptions such as an unscheduled refinery shutdown.

Annual retail prices are projected to increase through 1991, albeit slowly (Figure 3). Crude oil prices in 1990 and 1991 are expected to be higher on average than in 1989. Gross refiner margins (wholesale price minus crude oil cost per unit) should continue to remain relatively strong because of increased refiner costs caused by regulations requiring reduced vapor emissions and the extra cost of refining the premium blends of motor gasoline. Historically, gross refiner margins are highest in the spring and summer when motor gasoline demand is at its peak. Also, the vapor regulations are enforced during this period. Finally, there will most likely be continued steady increases in State and local gasoline taxes. The District of Columbia and 17 States raised taxes last year and about a dozen States are considering raising them this year.⁵ State and Federal taxes combined now account for about 25 cents per gallon of the pump price,⁶ well below any of the other industrialized countries.⁷

Heating Oil

Record-level cold temperatures last December on the East Coast, combined with about 6 refinery shutdowns sent residential heating oil prices to their highest points since the early 1980's for December and January. By the middle of January, increased production and very mild weather quickly pushed prices back down. Assuming normal weather next winter, heating oil prices should follow the price path of crude oil, in general, but peak during the winter (Figure 3). A colder-than-normal winter would lead to even higher prices. A price jump as high as that of last winter is less likely, however, since refiners and inventory holders are more likely to be cautious and to thus hold larger inventories.

Electric Utility Fuel Prices

Average residual fuel oil prices to electric utilities are expected to be 12 percent higher in 1990 than they were in 1989, reflecting higher first-quarter prices and higher crude oil costs (Figure 4). Prices in 1991 are expected to level off. Since residual fuel oil is the source of only about 5 percent of total electricity generation, end-use electricity rates will be only marginally affected.

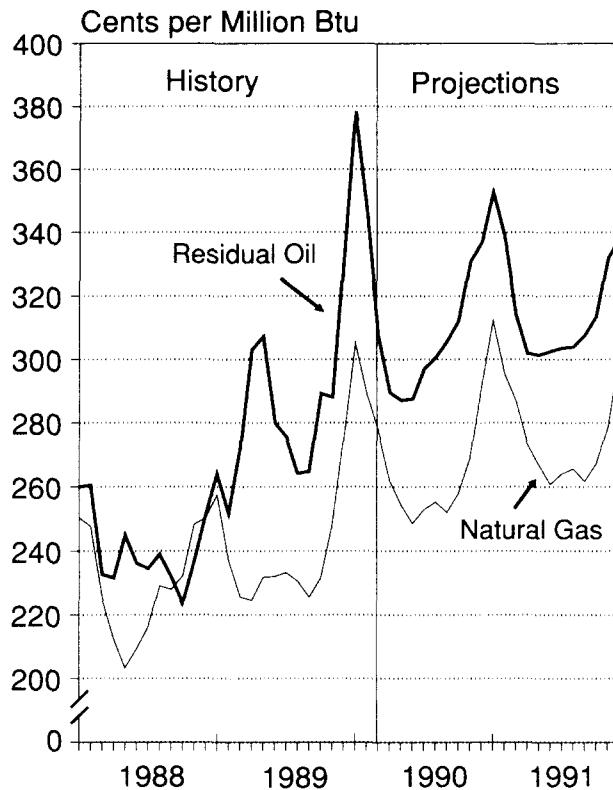


Figure 4. Utility Oil and Gas Prices

Sources: **History:** Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) (Washington, DC, 1990).
Projections: Table 5.

Increases in natural gas demand, particularly in the industrial sector, are likely to push prices up in all end-use sectors in both 1990 and 1991. Natural gas should still maintain its price advantage over residual fuel oil, but the gap is expected to narrow over the next 2 years.

Coal prices, which have risen slowly over the last several years, should continue to do so during the forecast period, rising at rates lower than inflation. Increased productivity, particularly the increased use of efficient underground mining methods has been a primary reason for this slow growth in coal prices. The recent settlement of the nearly 1-year-old strike between the United Mine Workers of America and the Pittston Coal Group on February 20, 1990, should not affect the price of coal to electric utilities.

Residential Electricity

Residential electricity rates have fallen in real terms since 1986 and are expected to continue on this path through 1991 (Figure 5). These rates should be largely unaffected by the projected increases in fuel costs through 1991, since they should be offset by slowly declining capital costs. Construction of new power plants has slowed considerably over the last few years. Furthermore, the use of existing capacity is rising, resulting in a steady decline in capital costs per unit of electricity produced. Lower real interest rates in 1990 should assist in the decline.

Macroeconomic Activity

Growth in real gross national product (GNP) will continue to decelerate in 1990 to 1.8 percent (Table 4), compared with the robust 1988 growth of 4.4 percent, reflecting a drop in the growth of real investment and exports. By 1991, both investment and exports recover, causing real GNP to expand by 2.5 percent. Consumption will be the major driving force behind the growth of real GNP in 1990. In 1991, a strong recovery in investment, especially business fixed investment, results in consumption and investment contributing about equally to real GNP growth (Figure 6).

The double-digit growth in exports which contributed so strongly to economic strength from 1987 through 1988 is not expected to

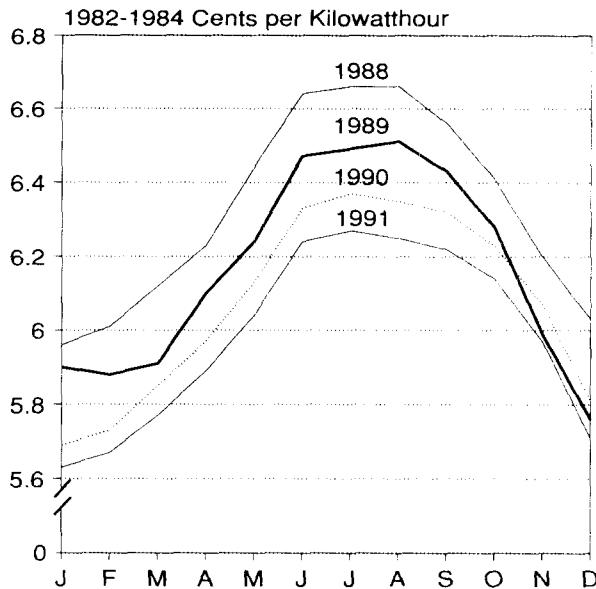


Figure 5. Real Residential Electricity Prices

Note: Projections begin in the second quarter of 1990. 1982-1984 prices are nominal prices divided by the consumer price index (urban).

Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(90/01) (Washington, DC, 1990); and U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Price Index* (Washington, DC). **Projections:** Table 5 for prices and DRI/McGraw-Hill Forecast CONTROL0390 for consumer price index.

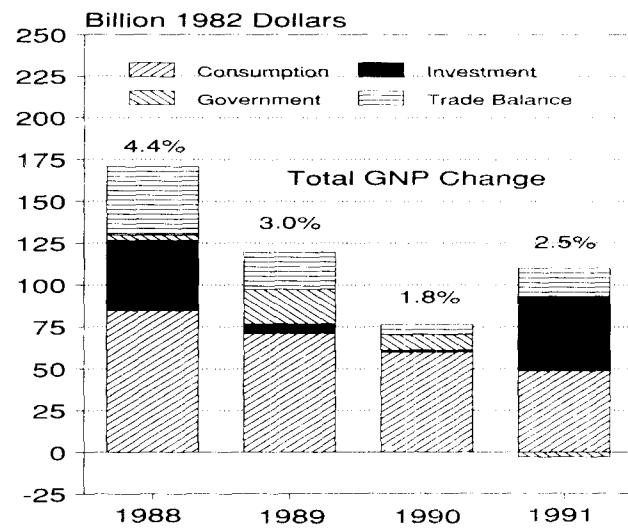


Figure 6. Real GNP Growth

Note: Projections begin in the second quarter of 1990.

Sources: **History:** Bureau of Economic Analysis, U.S. Department of Commerce, *Survey of Current Business*, March 1990; Federal Reserve System, *Statistical Release G 12.3*, March 1990. **Projections:** Table 4.

reoccur over the forecast period. The recent strength of the dollar will slow export growth in 1990. A modest recovery in 1991 is expected as the dollar depreciates by roughly 3.0 percent per year over the next 2 years. Growth in manufacturing production is also expected to slow in 1990 but will recover in 1991 (Figure 7). Import growth will continue to decline from the high rates of the mid-1980's, reaching roughly 4.0 percent per year for 1990 and 1991.

Real disposable income is expected to mirror growth in real GNP in 1990, slowing noticeably from 1989. In 1991, income will grow more slowly than real GNP. The difference in growth rates in 1991 between GNP and income reflects, in part, a tendency for consumer prices to rise more rapidly than prices for domestic production (by an average of 0.9 percentage points per year). This trend has persisted since 1987 and is expected to continue. In addition, the effective personal tax rate is expected to rise slightly, as State and local governments struggle to meet increased funding needs.

Economic growth is a major determinant in explaining energy demand. Since forecasting macroeconomic growth involves uncertainty about the magnitude of change of crucial economic variables affecting the macroeconomy, the high and low demand cases incorporate a band of GNP growth, roughly 1.0 percent above and below the base case growth rates.

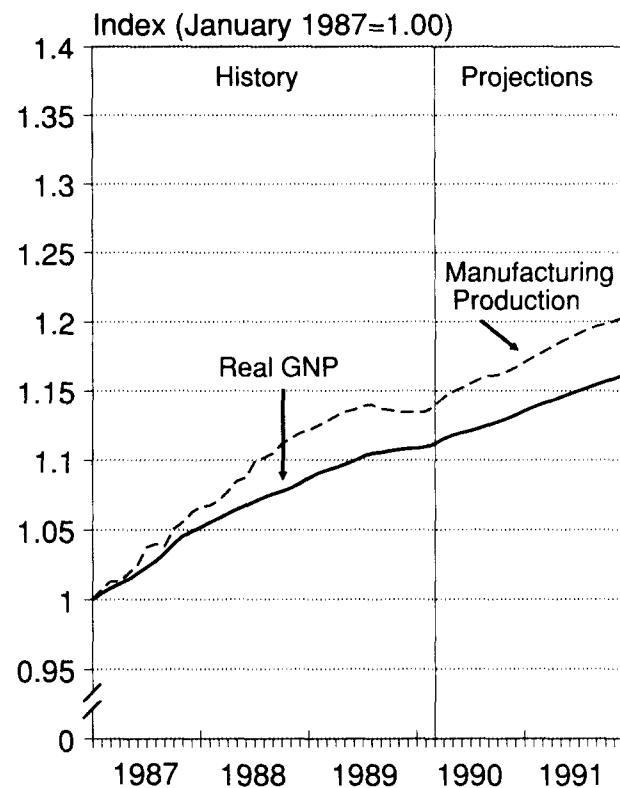


Figure 7. Key Economic Indicators

Sources: **History:** Bureau of Economic Analysis, U.S. Department of Commerce, *Survey of Current Business*, March 1990; Federal Reserve System, *Statistical Release G.12.3*, March 1990. **Projections:** Table 4.

U.S. Petroleum Outlook

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

Petroleum Demand

Overview

Although petroleum demand in the United States held about steady in 1989, the outlook for 1990 is weaker. Overall product supplied in 1990 is expected to be about 90,000 barrels per day below the 1989 level, although a significant rebound in demand is expected for 1991 (Table 6 and Figure 8). Extremely mild weather for the first 3 months of this year in the North Central and Northeastern regions of the country resulted in below normal seasonal demand for fuel oil. EIA's current estimate for first-quarter 1990 demand is 17.1 million barrels per day, nearly one-half million barrels per day below last year's first-quarter average.⁸ The effects of mild weather were likely to have been exacerbated by very weak economic growth in the first quarter, which may well turn out to be the low point in the current economic deceleration. While economic growth should start to improve throughout the year (on a year-over-year basis), 1990 looks rather bearish on average. Gasoline demand, which should have risen in response to the warm winter weather, shows no signs of great strength so far this year. Thus, demand for fuel in the transportation sector, which is usually a primary source of oil demand strength, may be about level. Nevertheless, growth in petroleum demand is gradually rising. The exception to this is demand in the fourth quarter of 1990, which is expected to be below demand in the fourth quarter of 1989 by about 40,000 barrels per day. This is due to the unusually cold weather in December 1989 and a related surge in shipments of heating oil.

While petroleum demand is expected to decline this year, an increase of nearly 290,000 barrels per day is projected for 1991. Of this expected increase, about 33 percent can be attributed to the assumed transition from extremely mild weather in the first quarter of this year to normal weather in the first quarter of 1991.⁹ Another factor affecting the decline in 1990 levels (and thus the outlook for strong demand for 1991) is the possibility that significant anticipatory stockpiling of certain products by distributors and consumers occurred in December. Shipments of motor gasoline and jet fuel, as well as other fuels, were extraordinarily high at the close of 1989, as cold weather initiated a surge in heating oil demand and prices. The situation in the heating oil market clouded the short-run outlook for other product supplies, inducing excess demand for these products which was met by increased shipments from primary inventories. The latter development obviated the necessity for refiners to ship as much of some products in early 1990 as would normally have been expected. It should be noted that one product for which an entirely opposite phenomenon was present during the early months of 1990 is propane. Actual supply constraints (and forced conservation) of propane were a real problem in December 1989. It is apparent from propane shipments in January and February, that replenishment of downstream supplies created significant increases in the product supplied data reported by EIA. The non-weather related increases in demand for 1991 arise from the resumption of higher economic growth, but also from assumed stabilization of nominal oil prices and a resumption of a downward trend in fuel prices adjusted

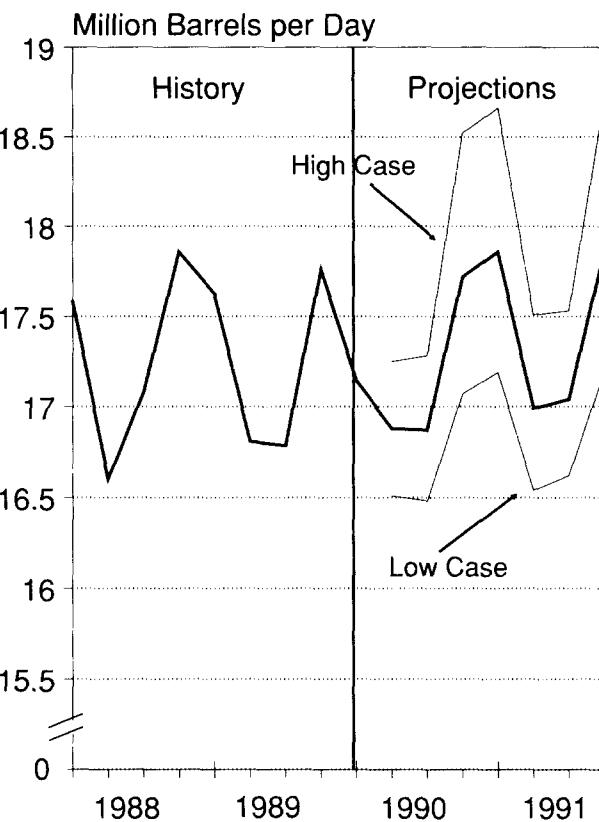


Figure 8. Total Petroleum Demand

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(90/01) (Washington, DC, 1990).

Projections: Tables 6, 8, and 9.

for inflation. Motor gasoline demand should turn upward slightly as real prices retreat after two years of average real increases. (See "Motor Gasoline" section). Feedstock use and industrial minor fuels are expected to gain solidly next year as manufacturing growth resumes. (See "Other Petroleum Products" section).

Petroleum Demand Sensitivities

Table 7 provides a summary of the estimated sensitivity of domestic petroleum demand to alternative macroeconomic growth assumptions, variations in the world oil price, and weather conditions. The table provides upper and lower ranges for key demand determinants, which result in ranges of projected petroleum demand (other variables held constant). The absolute values of these demand ranges are given (in million barrels per day) below the ranges for the determinants.

The alternative macroeconomic scenarios provide a range of real GNP which extends, by 1991, 2.1 percent above and below the base case. Analysis of macroeconomic forecasts over the last 10 years 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.

Two price cases are given in the table. The first shows the price effect on demand stemming from oil price variations from the base case which are coupled with induced shifts in other energy product prices, most notably natural gas. The induced shifts in the prices of products which compete with oil products largely eliminate any incremental substitution of natural gas or other fuels for petroleum in sectors where switching potential is significant. In order to present a price sensitivity band which encompasses a range of demand that can be reasonably characterized as an upper bound on total price sensitivity, a second price case was added which shows the effect on demand when only the prices of oil products change.¹⁰

The weather sensitivities are based on assumed deviations from normal weather which correspond to the greatest quarterly variances in weather observed over the past 15 years. Combining the information from Table 4 with that in Table 7, the sensitivities of domestic petroleum demand to changes in the three determinants discussed above can be summarized as follows:

- For every 1 percentage point of additional growth in real GNP, petroleum demand can be expected to increase by about 134,000 barrels per day;
- If all energy product prices increase, for every \$1.00 increase in world oil price, petroleum demand can be expected to fall by approximately 30,000 barrels per day;
- If petroleum prices increase, for every \$1.00 increase in world oil price, petroleum demand can be expected to fall by approximately 80,000 barrels per day;
- For every 1 percent increase of cooling degree-days above normal levels, petroleum demand is expected to increase by 0.03 percent; for heating degree-days, petroleum demand is expected to increase by 0.11 percent.

Tables 8 and 9 provide summaries of extreme petroleum demand cases, combining adverse (mild) weather with high (low) macroeconomic cases and low (high) energy prices to generate the extremes. The tables also incorporate high (low) estimates for domestic oil production given the high (low) world oil price assumptions.

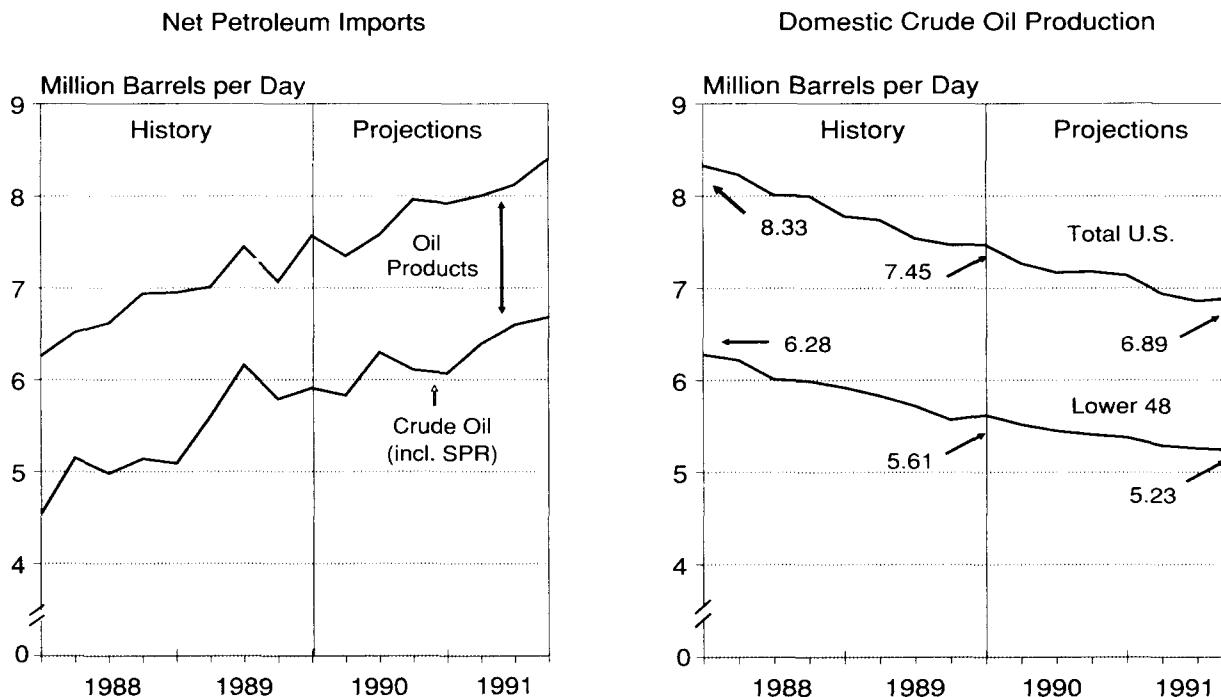
Petroleum Supply

In 1990, domestic crude oil production is expected to decline by 370,000 barrels per day, down 4.8 percent from the previous year (Table 6). An additional drop of 300,000 barrels per day is projected for 1991, representing a further year-to-year decline of 4.1 percent in domestic output. As a result, dependency on imported sources of petroleum (crude oil and natural gas plant liquids) is expected to increase at a relatively quick pace, despite the weak outlook for demand during the forecast interval. Projections for 1990 indicate that a continued decline in domestic production will contribute to an increase in the

dependency on net imports to 44 percent from 41 percent last year (Table 6 and Figure 9). Import dependency is expected to climb to 47 percent in 1991.

In 1989, Lower-48 crude oil production declined by 360,000 barrels per day, or about 6.0 percent, from 1988 levels, contributing to the largest year-to-year decline in total domestic crude oil production of 510,000 barrels per day (Table 6 and Figure 9). Reversing a trend of steady increases which helped offset Lower-48 output declines during the past several years, Alaskan production fell by more than 140,000 barrels per day, accounting for more than one-fourth of the total reduction in domestic output. Additional declines in Alaskan production averaging 100,000 barrels per day are expected for 1990 and 1991. Declines in Prudhoe Bay production rates dominate the Alaskan outlook. It is anticipated that production from new fields is unlikely to offset the natural rate of decline in Alaskan oil production. Trans-Alaskan Pipeline System shutdowns and scheduled field maintenance are expected to affect output more than in previous years, contributing to the decline in North Slope production. Production in the Lower 48 States is projected to fall by 260,000 barrels per day in 1990, or slightly more than two-thirds of the decline of the previous year. This projection assumes that the Point Arguello field will not come on-stream this year, but may contribute to production by the third quarter of 1991. Regulatory problems may have an adverse impact on the timing and magnitude of this production. After several years of sharp declines in drilling activity, the stable price environment is expected to keep average drilling rates at least as high as rates in 1989 (869 active rigs on average),¹¹ helping to moderate production declines.

In 1990, total net imports of crude oil and petroleum products are projected to average 7.6 million barrels per day, or 500,000 barrels per day above 1989 levels. This increase reflects falling domestic oil production, and a shift to a sizable net buildup of product stocks as opposed to a significant net drawdown in 1989. A similar increase in imports is expected for 1991 as domestic oil production continues to slide and demand picks up.



Motor Gasoline

Motor gasoline demand is projected to remain steady in 1990, having fallen by 0.1 percent in 1989 (Table 10 and Figure 10). A further slowdown in economic growth is expected to account for much of the moderate growth in highway travel activity of only 1.9 percent, the smallest increase since 1980. Moreover, retail prices are projected to average 2.7 percent above 1989 levels after adjustment for inflation, contributing to the lack of demand growth.¹² Although moderating after several years of rapid increases, the growth in fuel efficiency of 1.9 percent is still sufficient to offset the increase in vehicle miles traveled on motor gasoline demand for the year as a whole. The combination of fewer, less fuel-efficient vehicles remaining to be retired, the virtual absence of efficiency gains in new automobiles during the last few years, and steadily increasing road congestion are expected to limit efficiency growth in both 1990 and 1991.

Reversing 2 years of decline, motor gasoline demand is projected to rise in 1991, increasing by 0.4 percent to 7.4 million barrels per day, the highest level since the record consumption of 1978. That recovery is largely attributed to a 2.9-percent decline in real retail prices, offsetting the previous year's price increase. In response to improved macroeconomic conditions and somewhat lower real gasoline prices, growth in highway travel activity is projected to increase by 2.0 percent next year. In addition, growth in fuel efficiency is likely to moderate further to 1.6 percent, contributing to the increase in demand.

Motor gasoline markets have reacted to the rise in prices since the beginning of the year. Premium grade's market share, which had been recovering from last spring's price hike, claimed 25 percent of sales in December, returning to the peak reached in early 1989, but retreated to 24 percent by January (Figure 10).

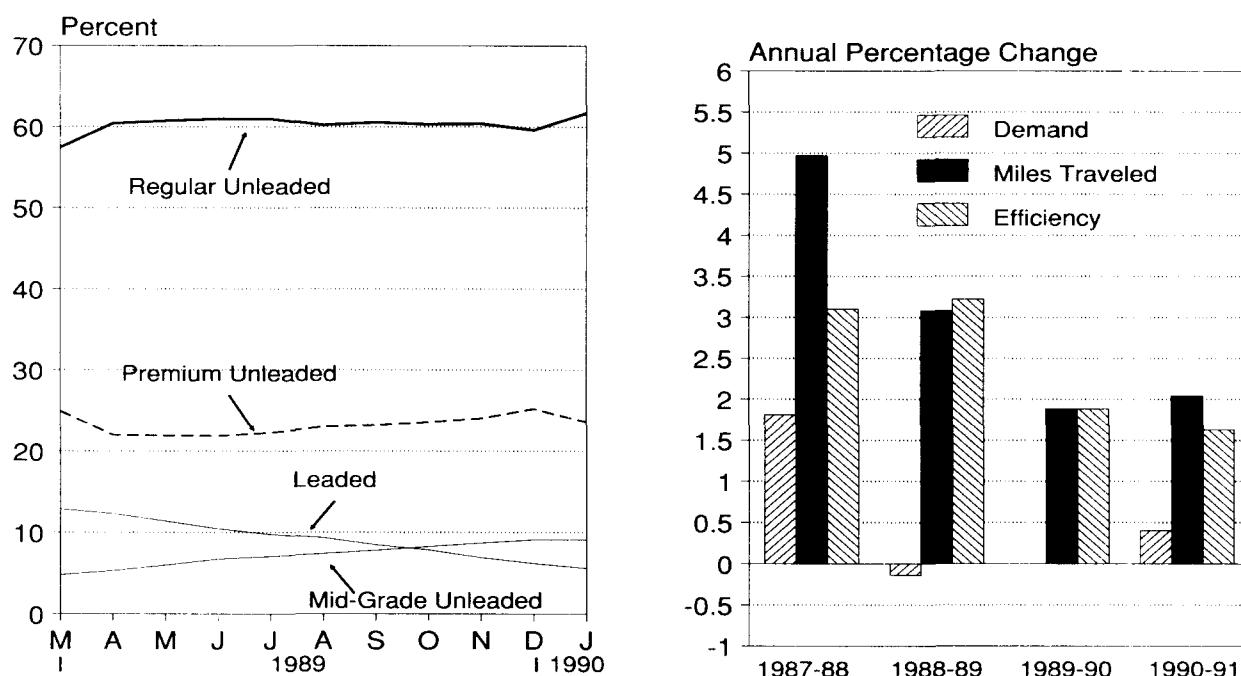


Figure 10. Motor Gasoline Market Shares by Grade and Demand Components

Note: Projections begin in the second quarter of 1990.

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(90/01) and *Petroleum Marketing Monthly*, DOE/EIA-0380, Table 47, various issues (Washington, DC, 1990); and U.S. Department of Transportation, Federal Highway Administration, *Traffic Volume Report* (Washington, DC). **Projections:** Table 10.

Distillate Fuel Oil

Distillate fuel oil demand is expected to decline by an average of 70,000 barrels per day this year (Table 11). Milder weather in the first and fourth quarters of 1990 than in 1989 is the basis for this outlook. The bottoming out of industrial growth precludes any strong increases in boiler fuel use or diesel consumption. Next year, however, is expected to bring a brisk rebound in distillate fuel oil demand, with total product supplied climbing by about 130,000 barrels per day. Growth in distillate fuel oil demand in the transportation sector is expected to be weak this year but should strengthen in 1991, as industrial activity and highway and railroad freight movements pick up (Figure 11).

Due to the extreme weather conditions in the fourth quarter of 1989, actual demand for distillate in that quarter was 150,000 barrels per day higher than it would have been with normal weather. Because the weather was mild in the first quarter of 1989 and resulting distillate demand was low, however, this increase is only 10,000 barrels per day for the year. Because of the mild weather in the first quarter of 1990, demand for distillate should average 60,000 barrels per day lower, on an annual average basis, than would have been the case had weather been normal. In 1991, demand should rebound sharply, given normal weather expectations.

Residual Fuel Oil

Residual fuel oil demand, buoyed in recent years by a succession of relatively low prices, inadequate hydroelectric power availability, extreme weather conditions, and, in some regions, weak growth in nuclear power output, is projected to decline gradually this year and in 1991 (Table 12 and Figure 12). This forecast reflects the expectation that coal-fired, nuclear, and hydroelectric generation sources will be adequate to meet incremental electric utility energy requirements and that the persistently weak pattern of nonutility use of heavy oil will continue.

The relative strength in residual fuel oil demand since 1987 has been sustained by heavy oil use at electric utilities (Figure 12), which has remained recently at or above 1986 levels when oil prices fell dramatically. Although nonutility residual fuel oil demand was also boosted in 1986, subsequent periods have exhibited a steady downward trend, even amidst sharp price declines (1988) and solid economic growth (1988 and 1989). With real economic growth expected to be below 2.0 percent this year, and with oil prices holding firm, nonutility residual fuel growth is expected to weaken. Because of unusual regional patterns of electricity supply, utility oil use should taper off as well by 1991. (See "Electricity" section.) Given the assumption of normal weather patterns throughout the forecast, electricity output from coal and non-fossil fuel plants should be adequate to preclude significant increases in combined oil and natural gas-fired units.

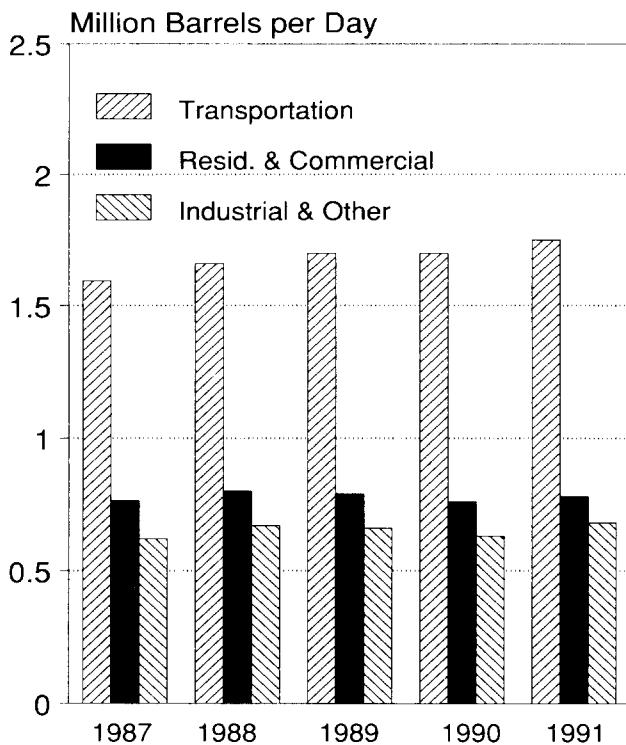


Figure 11. Distillate Fuel Oil Demand

Note: Projections begin with the second quarter of 1990, except for projections of sectoral demand which begin in 1989.

Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(90/01) (Washington, DC, 1990); and "Annual Report on Sales of Fuel Oil and Kerosene, 1988," in Appendix A of *Petroleum Marketing Annual*, DOE/EIA-0487(88); 1989 distillate demand by sector based on estimates by EIA's Energy Analysis and Forecasting Division. **Projections:** Table 11.

Other Petroleum Products

Demand for minor petroleum products (excluding jet fuel) declined in 1989 after several years of increases (Table 13). Much of the decline is attributed to a softening of petrochemical markets after more than 3 years of export-related growth. Demand for oil-based feedstocks led the decline, as prices for those products rose during the first half of the year. The resultant change in relative prices as well as the unusually cold weather during the fourth quarter, however, boosted the demand for liquefied petroleum products (LPG's). Within the LPG group, propane demand was bolstered by the colder-than-average fourth quarter. Butane availability for feedstocks and other uses increased as a result of the more stringent gasoline volatility requirements, which lowered the amount of butane used in the gasoline refining process.¹³ These requirements displaced sizable quantities of butane previously used as an octane enhancer in gasoline production. Ethane demand, however, declined. Reflecting the slowdown in industrial production growth, miscellaneous products demand fell by 4.3 percent in 1989.

In 1990, demand for other petroleum products is projected to increase by 1.5 percent (Table 13). The impact of a warmer-than-average first quarter following the previous year's colder-than-average fourth quarter, however, is expected to contribute to much of the 3.6-percent decline in LPG demand. The drop in LPG shipments in the first quarter would have been much greater except for a surge in propane shipments for downstream inventory replacement in the early weeks of the year. More favorable economics are expected to bolster demand for the oil-based feedstocks by 4.5 percent. Nonetheless, combined LPG/feedstock demand for the year is projected to fall by 1.9 percent. Miscellaneous products, however, are projected to increase by 5.6 percent, reversing the previous year's decline. Improvements in weather conditions and a slight easing of budgetary constraints in some States are expected to boost asphalt and road oil deliveries.

Improving economic conditions account for much of the projected acceleration in the increase in other petroleum products demand to 3.0 percent in 1991. LPG/feedstock demand is expected to rise 4.9 percent. The assumption of normal weather patterns (hence, normal inventory patterns), as well as increases in petrochemical activity, are expected to boost LPG demand by 5.0 percent; feedstock deliveries are expected to rise by 4.3 percent. Ethane, however, is expected to continue to lose ground to both the other LPG's as well as to the oil-based feedstocks, but the industrial recovery projected for 1991 is expected to moderate the rate of decline. A 1.1-percent increase for miscellaneous products is expected for 1991, partly as a result of increased still gas production brought about by a rise in refinery activity.

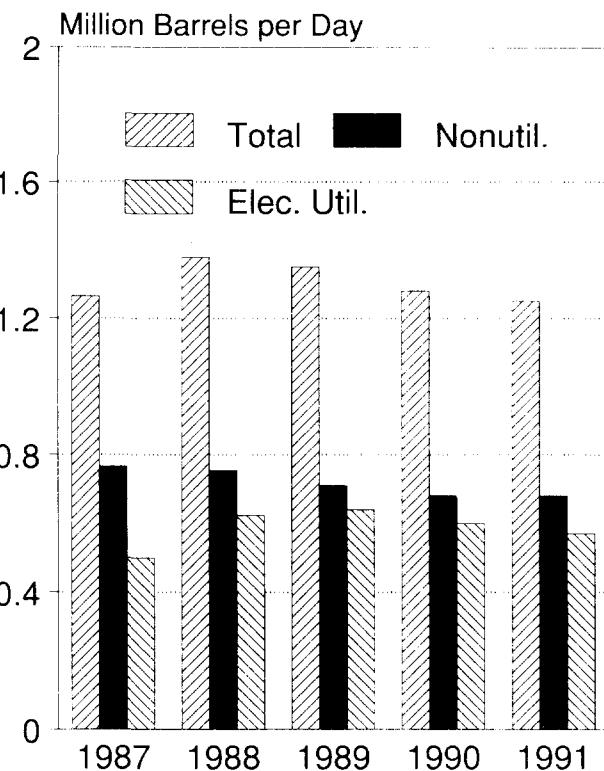


Figure 12. Residual Fuel Oil Demand

Note: Projections begin in the second quarter of 1990.
 Sources: **History:** Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0035(90/01), *Petroleum Supply Annual 1988*, DOE/EIA-0340(88)/2, and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to January 1990 (Washington, DC, 1990). **Projections:** Table 12.

Jet Fuel

Jet fuel demand is expected to grow at a conservative rate in 1990 and 1991 (Table 13 and Figure 13), compared with the robust growth of the 1980's. Slow to moderate economic growth and rising ticket prices (adjusted for inflation) are expected to keep airline travel growing modestly.

Revenue ton miles grew at a fairly strong rate in 1989, supported primarily by international passenger traffic which has shown vigorous growth for the last 3 years.¹⁴ Domestic passenger traffic, on the other hand, remained virtually constant in 1989 and is expected to lag behind international traffic in 1990 and 1991. Cargo traffic, which has shown very rapid growth over the last several years, appears to be slowing down somewhat. Although cargo/freight express traffic grew by 14 percent in fiscal year 1989, the Federal Aviation Administration (FAA) indicates that the numbers exaggerate the growth in travel because the United Parcel Service (UPS) was not required to report its travel statistics to the FAA before October 1988. The FAA estimates that cargo/freight express traffic would have grown by only 3.2 percent in fiscal year 1989 (FY89), if the UPS traffic had not been included in the FY89 statistics.¹⁵

Jet fuel product supplied for the first quarter of 1990 appears weak, but this is due largely to lower fuel requirements following a surge in shipments in the fourth quarter of 1989. It appears that suppliers of jet fuel experienced a sharp run on primary stocks in December of 1989, as record low temperatures necessitated a strong shift in the refined product slate toward heating oil, restricting the production of other refined products such as jet fuel. With prices rising rapidly and the domestic supply picture clouded by a potential crisis in fuel oil availability, distributors and consumers of jet fuel were seeking to protect their market position by accelerating fuel purchases, principally drawn from primary inventories.

Airline ticket prices are expected to rise in 1990 and 1991, partly as a result of the increase in jet fuel prices that followed the market disruption in late 1989. Early in the first quarter of 1990, some airlines announced surcharges to cover their increase in fuel costs, but these fare increases were delayed because of soft bookings.¹⁶ Nevertheless, by the end of the first quarter, discount fares were beginning to erode as air traffic demand showed strength in what is normally a slow travel period.¹⁷

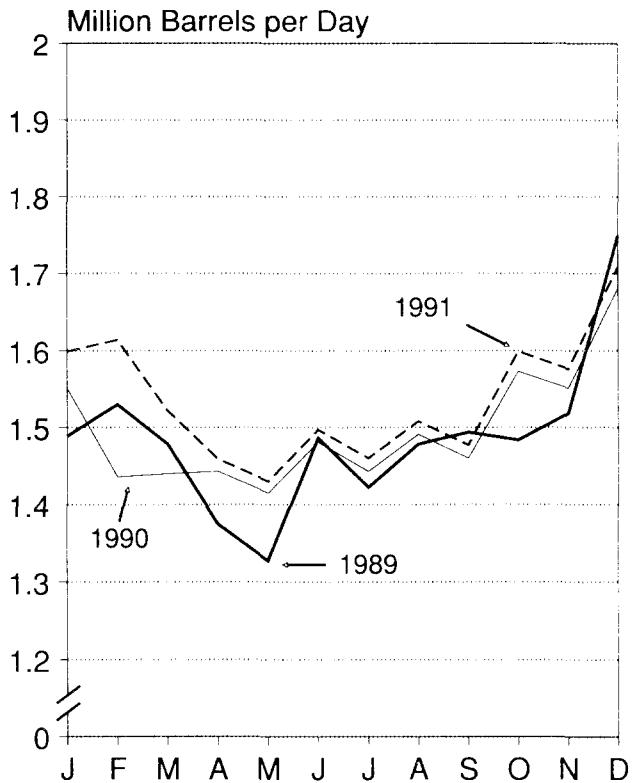


Figure 13. Jet Fuel Product Supplied

Note: Projections begin with the second quarter of 1990.
Sources: **History:** Energy Information Administration, Petroleum Supply Annual 1988, DOE/EIA-0340(88)/2, and *Petroleum Supply Monthly*, DOE/EIA-0109, January 1989 to January 1990 (Washington, DC, 1990). **Projections:** Table 13.

Outlook for Other Major Energy Sources

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

Natural Gas

Natural gas deliveries are projected to fall by 0.7 percent in 1990 and then increase by 3.2 percent in 1991 (Table 14). These projections have been revised from those presented in the January 1990 *Outlook* as a result of changes in weather conditions for the 1989/1990 winter. The abnormal temperatures in the fourth quarter of 1989 resulted in higher consumption of natural gas in 1989 than previously estimated, while the mild temperatures in the first quarter of 1990 resulted in lower projections of natural gas consumption in 1990.

In the residential sector, deliveries of natural gas are projected to fall by 5.2 percent in 1990 due to the mild winter weather conditions, but are projected to rise by 5.7 percent in 1991. These rates are higher than the 4.5-percent rate for 1989. In the commercial sector, natural gas deliveries are also projected to fall in 1990 by 4.4 percent, but will rise again in 1991 by 5.0 percent, more than double the growth rate in 1989. Demand for natural gas in 1991 will grow most rapidly in both sectors because of the assumption of normal weather (hence, much colder than in 1990) in the early months of next year (Figure 14). Between 1990 and 1991, most of the growth in natural gas demand in the residential and commercial sectors combined is due to the effect of returning to normal weather next winter.

Deliveries to the industrial sector are projected to grow by 2.0 percent in 1990 and 1.9 percent in 1991, down significantly from the 7.2-percent increase of 1989. By 1991, with end-use gas prices generally rising relative to competing oil prices, the effect on gas use of accelerating economic growth is expected to be offset somewhat by switching to fuel oil. Deliveries to the electric utility sector are projected to remain steady in 1990 but are expected to increase in 1991.

Coal

Coal demand is expected to grow rather slowly in 1990, but should increase at a faster pace in 1991. In 1990, coal demand is expected to grow only in the electric utility sector; in 1991, coal demand in both the utility and nonutility sectors should show positive growth (Table 15 and Figure 15).

Following sluggish growth in 1989, coal demand in the electric utility sector should increase somewhat faster in 1990, even though the growth in the level of total electricity generation is expected to be weak. The slow growth in 1989 was caused by several factors, including overall weak growth in demand for total generation, temperatures in heavy coal consuming regions that were milder than the national average, and vigorous growth in the use of hydroelectric and nuclear power. Stronger growth in total electricity demand and little increase in the use of nuclear power will lead to rather robust coal demand in the electric utility sector in 1991.

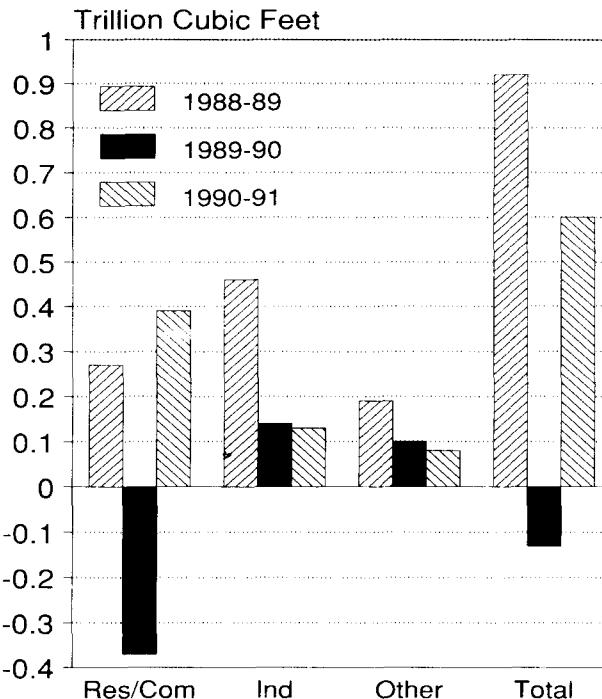


Figure 14. Annual Change in Natural Gas Demand

Note: Projections begin in the second quarter of 1990.

Sources: History: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) (Washington, DC, 1990). Projections: Table 14.

Coal demand at coke plants is expected to decline in 1990 and rebound in 1991, following the pattern in the demand for raw steel.¹⁸ Raw steel production is expected to decline in 1990 because of a general weakness in the economy, including a slowdown in private domestic investment (adjusted for inflation). As the economy rebounds in 1991, raw steel production is expected to follow. In addition, although the share of raw steel production in electric arc furnaces is expected to increase in 1990 and steel production is declining, the use of coal in domestic coke ovens should be buoyed by a decline in the level of coke imports, as manufacturers of pig iron at basic oxygen furnaces use domestically produced coke when available. In 1991, the level of coke imports is expected to increase, as domestic coke production reaches capacity limits.

In the retail and general industry sectors, coal consumption stays virtually constant in 1990, and increases slightly in 1991. Industrial coal consumption is expected to decline slightly in 1990, because of a general tendency toward lower intensity of coal use in many manufacturing industry groups and because strong output growth in these industries is not expected. Output growth in several coal consuming industries is expected to be strong in 1991, resulting in a modest increase in industrial coal demand. Coal consumption in the residential/commercial sector and also at coal gasification plants should stay fairly constant throughout 1990 and 1991.

Coal production levels are projected to pass the 1 billion ton mark in 1991, falling just shy of the mark in 1990. Coal exports are projected to decline in 1990 due to the assumption of increased availability of lower priced coal from other countries such as Australia. Exports remain fairly constant in 1991.

Electricity

Sales

Total electricity sales should increase by 2.7 percent in 1990 and by 3.8 percent in 1991 (Table 16). These growth rates compare with 2.6 percent for 1989. Mild weather during the first and third quarters of 1989 and during the first quarter of 1990 has resulted in growth in electricity demand below trend rates (growth in demand if weather is normal). While record-breaking cold weather in December 1989 boosted electricity demand, gains in demand in that month did not outweigh the decrease in electricity demand caused by

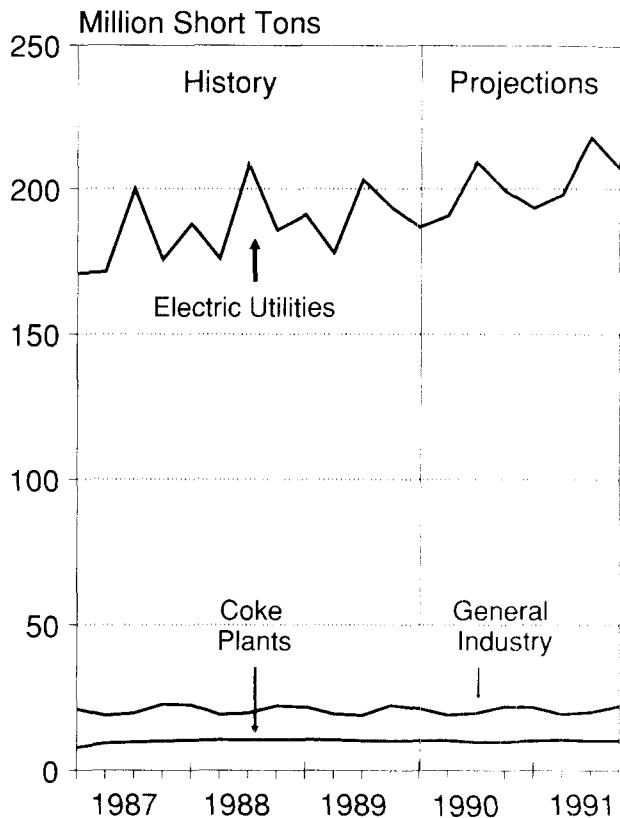


Figure 15. Coal Consumption

Sources: **History:** Energy Information Administration, *Quarterly Coal Report*, DOE/EIA-0121(89/4Q) (Washington, DC, 1990). **Projections:** Table 15.

mild summer temperatures, for the year as a whole. Removing the influence of the weather, the short-term trend in electricity growth is estimated to be about 3.0 percent per year through the end of 1991 (Figure 16). Economic activity plays a role in determining the short-term growth trend in electricity demand. Gross national product is expected to increase less rapidly in 1990 than in 1989, but pick up again in 1991. This has a small effect on the level of commercial activity and on the propensity of residences to purchase electrical products. Thus when weather factors are held constant, growth in electricity sales to commercial and residential establishments is expected to slow slightly in 1990 and regain strength in 1991.

The greatest response to economic activity in the short run is in the industrial sector. Industrial sales follow manufacturing activity fairly closely. Growth in manufacturing production is expected to slow considerably in 1990 but should accelerate substantially by 1991. As a result, growth in electricity sales to the industrial sector during 1990 should fall to one-half of the rate estimated for 1989 and rebound during 1991. Electricity sales to the other sectors (such as government, street lighting authorities, and railways) are expected to continue upward at a pace above 1.0 percent.

Sources of Domestic Utility Supply

Overall electricity requirements are expected to increase at a somewhat slower pace than electricity demand (Table 16). Alternative sources of electricity supply, such as imports and nonutility supply, should increase in availability (given normal weather expectations) and reduce some of the additional pressure on domestic supply in 1990 and 1991. Coal is expected to show the largest rebound of all fuels used at domestic utilities in 1990 (Figure 17). Growth in coal use in 1989 was relatively low given the total load of electricity demanded. Part of this situation can be attributed to mild weather; temperatures during some months in the spring and summer were milder than the national average in the largest coal-consuming regions. The more obvious explanation, however, is that nuclear generation increased substantially during the spring and summer of 1989 in two of the largest coal-consuming regions: the East North Central and the West South Central. The East North Central Region is also the second largest area of nuclear generation. Growth in hydroelectric power also reduced the need for coal in some regions. Though watersheds were not completely replenished in all regions of the country in 1989, the areas of improvement in hydroelectric resources corresponded with the major coal regions. These regional patterns are not expected to persist in the forecast period, because data for the latter part of 1989 and the first month of 1990 indicate that coal generation is near anticipated levels. If increases in nuclear and hydroelectric generation are again concentrated in certain coal regions, then coal generation could be lower than stated in this *Outlook*.

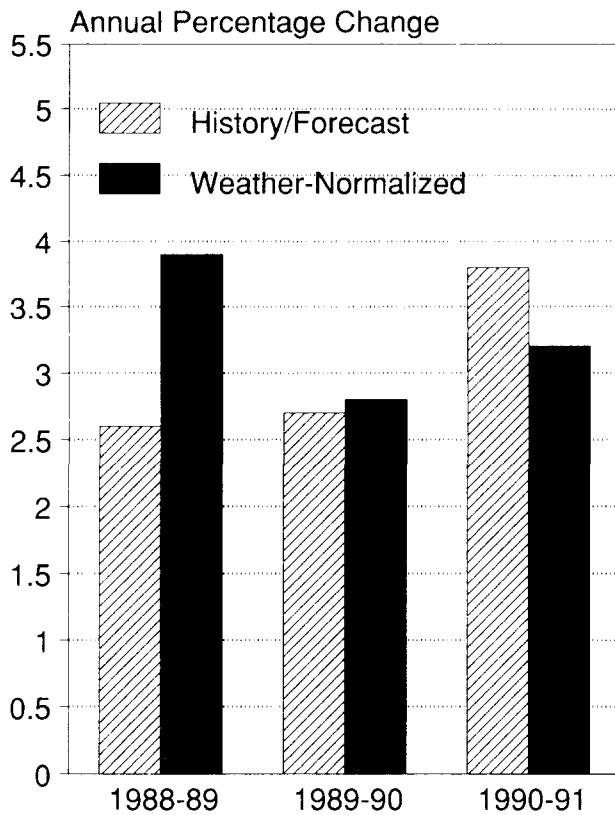


Figure 16. Electricity Sales Growth

Note: Projections begin in the second quarter of 1990.

Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(90/01) (Washington, DC, 1990).
Projections: Table 16.

Generation from coal will continue to grow at a rapid pace in 1991. The increase in total generation in 1991 is expected to be about double the 1990 increase, while the combined increase in the supply of nuclear and hydroelectric power is not expected to keep pace. Coal is therefore the expected choice for most of this additional electricity demand load, and coal generation should increase as a portion of total generation. In addition, coal capacity is projected to increase in 1991 enough to accommodate some of this load.

Although hydroelectric generation increased substantially during 1989, this source is not expected to fully return to more normal levels until the fall of 1990. Water conditions continue to improve in many areas of the country, but some regions continue to experience below-normal precipitation or suffer from the longer term effects of earlier drought conditions. The impact of continued dryness in these areas is expected to remain through the summer of 1990.

Nuclear power is beginning to lose share among the fuel choices at electric utilities. Although nuclear facilities are expected to increase their capacity usage rates (the national average was nearly 76 percent in January 1990—the highest monthly level since February 1979¹⁹), capacity additions are necessary to enable nuclear generation to keep pace with the growing demand for electricity. In 1990, 2 new units are expected to come on-line: Seabrook 1, which became operational in the first quarter; and Comanche Peak 1, which is expected to come on-line in the fourth quarter. These additions boost the nuclear share of total generation in 1990 only slightly from the last year. In 1991, no new units are expected to begin operation. The resulting share is below that recorded for 1989.

The combined level of generation from petroleum and natural gas is expected to decline in 1990 from the 1989 level. Increased availability of all of the other fuel categories should lessen the need for these higher cost sources. In 1991, however, the combined level of utility oil and gas should rise slightly to aid in meeting the growing electricity load. Nevertheless, the share of these two fuels relative to total generation should decline in both 1990 and 1991. Within this share, petroleum-fired generation is expected to decline over the next 2 years, after rebounding in 1989. A large part of the growth in 1989 was due to the record cold weather in December that caused natural gas suppliers to curtail utility customers in order to supply residential customers. Utilities turned to petroleum where it was available, as this is generally the only other option for meeting unusual peaks in demand. With weather patterns assumed to return to normal and oil prices expected to remain high relative to natural gas prices, natural gas use should increase by 1991. The price gap is expected to narrow, however, and should cause the drop in petroleum use and the growth in natural gas use at utilities to be small.

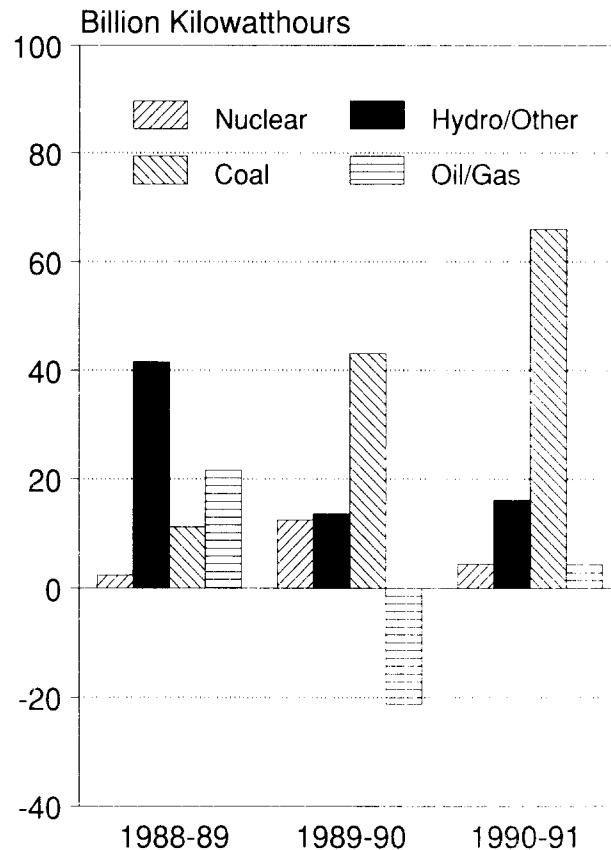


Figure 17. Annual Change in Electricity Generation by Fuel Source

Note: Projections begin in the second quarter of 1990.
 Sources: **History:** Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226(90/01) (Washington, DC, 1990).
Projections: Table 16.

Alternative Sources of Supply

Net imports of electricity are estimated to have declined from 32 billion kilowatthours to 12 billion kilowatthours between 1988 and 1989 but are expected to return to the 1988 level by 1991. The recent drought in Canada coupled with continued growth in Canadian domestic electricity demand reduced surplus power levels. Canadian utilities honored their firm power agreements with U.S. electric utilities in 1989, but these agreements are predominantly for interruptible power. Hence, Canada reduced interruptible exports to meet its own electricity needs in 1989. Drought effects are anticipated to persist through the mid-1990's. The growth in imports in 1991 is based on new transmission contracts scheduled to begin in the fall of 1990 and assumed normal precipitation that should replenish watersheds at hydroelectric facilities. Purchases of electricity from nonutility sources are expected to continue increasing at a steady pace through 1991 and gain as a percentage of total supply.

Special Topics

- **Summer Outlook for Motor Gasoline**
- **Natural Gas Futures Market**

Summer Outlook for Motor Gasoline

From May through August, motor gasoline product supplied is expected to increase to an average of 7.6 million barrels per day, about 40,000 barrels per day, or 0.5 percent, higher than the average for the same period last year.²⁰ The increase in demand stems from a 2.4-percent increase in vehicle miles traveled offset by a 1.8-percent rise in fuel efficiency. These projections reflect slowdowns from the more robust increases in both of these components during the past several years. The slowdown in the rate of growth of travel activity reflects in part the modest increase in key indicators of economic activity compared to last summer. For example, real disposable income is expected to register only a 1.8-percent gain over 1989 levels for the summer months. Despite low growth expectations, the projected average level of gasoline demand for this summer represents the highest level since 1978, when demand reached an all-time high of 7.8 million barrels per day between May and August.

The outlook for motor gasoline consumption for this summer contrasts with the forecast of a slight decline in demand for the year as a whole. The summer's projected year-to-year demand increase, in fact, results from unusual factors that depressed demand during the same period last year. Last summer, the temporary but pronounced price spike pushed average inflation-adjusted retail gasoline prices almost 10 percent higher than during the summer of 1988. As a result, real prices during the upcoming driving season are expected to decline by 2.4 percent from levels of the same period last year, even though they are expected to increase by 2.6 percent for the year as a whole. In addition, federally mandated changes in volatility requirements were believed to have reduced refinery shipments during the early part of last summer, resulting in larger-than-normal reliance on secondary stocks. Nonetheless, the anticipated decline in inflation-adjusted summer gasoline prices, continued moderation in fuel efficiency gains, and the expectation that refinery operations will be less affected by the seasonal change in volatility standards than during last year are expected to result in an increase in motor gasoline demand during the upcoming driving season.

The three major supply sources—domestic refinery production, imports, and primary inventories—are expected to be able to meet the anticipated demand for motor gasoline for the upcoming driving season. U.S. motor gasoline production is expected to average 7.1 million barrels per day, a decline of approximately 40,000 barrels per day from last summer. In 1989, high gasoline margins as well as sizable increases in gasoline-related output capacity stimulated summer production by domestic refineries to an 11-year high. Since then, gasoline producers have continued to add small amounts of downstream capacity.²¹ Therefore, the slight reduction in domestic gasoline output is expected to reflect projected declines in refinery margins rather than capacity constraints. These projections, however, assume that weather- or accident-related disruptions of refinery operations will not be a factor this summer.

Net imports, which often respond more quickly than domestic refineries to changes in demand, are expected to average 387,000 barrels per day, up from last summer's market-depressed average of 324,000 barrels per day, but still less than the all-time summer high of 432,000 barrels per day in 1988. This source represents approximately 5.0 percent of anticipated summer requirements. Several overseas refiners which supply imported motor gasoline to the United States have been continually upgrading their facilities to accommodate the more stringent volatility standards enacted last year.²²

Primary stock drawdowns during the summer months usually account for less than 1.0 percent of motor gasoline demand. In 1990, inventories of finished motor gasoline are expected to contribute an average of 66,000 barrels per day to anticipated summer requirements, compared with 53,000 barrels per day in 1989. Stocks of motor gasoline (including blending components) are projected to be 226 million barrels at the beginning of the summer and 217 million barrels at the end of the summer driving season as a result of the stock drawdown. Inventories, therefore, are expected to remain well above the threshold of 205 million barrels defined by the National Petroleum Council as the minimum required to avoid spot shortages arising from unanticipated demand fluctuations.

Natural Gas Futures Market

On February 27, 1990, the Commodity Futures Trading Commission (CFTC) approved the opening of a natural gas futures market on April 3, 1990, by the New York Mercantile Exchange (NYMEX).²³ The natural gas futures trade is the NYMEX response to the perceived need for a clear, widely available reference price for natural gas. According to proponents of this market, anticipated advantages will be a greater price visibility, increased trading liquidity, and facilitation of risk management. Trade in natural gas futures will enable the industry to hedge price risks (a form of protection against unexpected price movements in the cash market, involving the simultaneous purchase or sale of equal and opposite positions in the cash and futures markets), lock in target profit margins, determine a real market price, and enhance the flexibility and performance of cash market operations, in the same manner that trade in oil futures has done for the oil industry.

This market will be based on delivery at the Henry Hub near Erath, Louisiana. According to the CFTC's Division of Economic Analysis, the terms and conditions of the new futures contracts are generally in conformance with the cash market practices and the contract is not likely to be susceptible to price manipulation or distortion. The contract unit for trading will be 10 billion British thermal units (Btu) with prices in dollars per million Btu. The minimum price fluctuation will be equal to one-tenth of one cent per million Btu or \$10 per contract. The maximum daily limit on trade will be 10 cents per delivered million Btu, except during the month just prior to the delivery month. June 1990 will be the first of the 12 consecutive delivery months traded at the NYMEX.

The gas futures trade is not likely to cause either lower or higher delivered prices, but may well facilitate longer term contracting, by providing a basis for contract indexing and a better climate for the development of gas resources. If this enterprise becomes successful, one result may be a smoothing of the seasonality of natural gas prices by arbitragers (individuals who buy and sell similar commodity futures simultaneously in order to benefit from an anticipated change in the price relationships) who take advantage of price spreads between the futures prices and spot prices. Another possibility is that this introduction of futures gas trading might stimulate the struggling residual fuel oil futures market, as opportunities are expected to be provided for trading based on the Btu spread between the competitive fuels.

To become successful, it is likely that any new futures market will only gradually increase in volume of trading to its eventual normal level. Thus, in the initial stage, the new market will probably not significantly influence the cash market for at least a year or more. Moreover, there are several questions that have to be addressed before the market attracts enough players. The natural gas market, unlike the oil market, is still heavily regulated (though some of these controls will disappear in 1993) and is subject to Federal Energy Regulatory Commission (FERC) rulings, to other regulatory bodies such as Public Utility Commissions, and to court decisions. Therefore, a decision by FERC or the courts could suddenly change the rules and affect the spot price, making the prediction of relationships between the futures price and the spot price somewhat problematic. Another question not fully answered is how well the delivery mechanism will work when weather is abnormally cold during peak demand periods. Also, the extent to which regulated groups such as electric utilities will use the futures market is uncertain, since it is uncertain whether public utility commissions would allow them to charge their customers rates based on the cost pass-through mechanisms, particularly if they were to take a loss on the futures market. Answers to these questions and others are likely to emerge within the next year.²⁴

References

1. Energy Information Administration, *Weekly Petroleum Status Report*, DOE/EIA-0208(90-13,90-14), Table 10 (Washington, DC, March 1990). Data are rounded to the nearest dime.
2. McGraw-Hill, Inc., *Platt's Oilgram Price Report* (New York, NY, 1990).
3. The non-U.S. production changes are based on internal calculations by the International and Contingency Information Division of the Office of Energy Markets and End Use.
4. The changes in total CPE oil demand and non-Soviet CPE oil production are based on internal calculations by the International and Contingency Information Division of the Office of Energy Markets and End Use.
5. Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(88/12,89/12), "Federal and State Motor Fuel Taxes" table (Washington, DC). In addition to State motor gasoline taxes, some States such as California and New York add a sales tax. Other States like Alabama and Alaska levy special fees on motor gasoline such as an inspection fee or an environmental tax, respectively.
6. Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380(89/12) "Federal and State Motor Fuel Taxes" table (Washington, DC).
7. Considering all taxes (including local taxes), the share of the U.S. pump price for gasoline accounted for by taxes was 32 percent as of the first quarter, 1989. This percentage was the lowest among all OECD countries. See International Energy Agency, *Energy Prices and Taxes*, Figure 11 (Paris, 3rd Quarter 1989).
8. The first-quarter estimate includes data from the *Petroleum Supply Monthly* for January and estimates based on the *Weekly Petroleum Status Report* for February and March.
9. The estimate of percentage weather effect given here is based on internal model calculations by the Energy Analysis and Forecasting Division.
10. The second oil price case is an extreme case in that, in addition to assuming constant prices for nonpetroleum products, maximum and minimum ranges observed for oil-based electricity generation as a percentage of combined oil-based plus gas-based generation, over the period 1983 to 1989, were assumed for the low-price and high-price cases, respectively. The maximum and minimum values for the oil- to- oil-plus gas ratio were applied on a quarter-by-quarter basis.
11. Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) (Washington, DC, 1990), Table 5.1.
12. Changes in inflation-adjusted retail motor gasoline prices reported here are based on calculations performed by the Energy Analysis and Forecasting Division of the Office of Energy Markets and End Use using retail prices (as shown in Table 5) deflated by the consumer price index (taken from the macroeconomic simulation used in this forecast).
13. Butane product supplied increased from 163,000 to 194,000 barrels per day from 1988 to 1989. See Energy Administration, *Petroleum Supply Monthly*, DOE/EIA-0109(89/12), Table 5, and *Petroleum Supply Annual*, DOE/EIA-0340(88/1), Table 3 (Washington, DC, 1990).
14. All airline traffic statistics are obtained from I.P. Sharp Associates, Limited (Toronto, Canada) unless otherwise indicated.
15. Federal Aviation Administration, *FAA Aviation Forecasts* (Washington, DC, March 1990).

16. *Wall Street Journal* (New York, NY, January 11, 1990 and February 20, 1990).
17. *Wall Street Journal* (New York, NY, March 16, 1990).
18. Steel production forecasts are produced by the Energy Analysis and Forecasting Division of the Office of Energy Markets and End Use, as part of the STIFS Coking Coal Demand Model.
19. Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) (Washington, DC, 1990), Table 8.1.
20. The summer gasoline demand forecast is compiled from monthly summaries of the STIFS Modeling System, maintained by the Energy Analysis and Forecasting Division of the Office of Energy Markets and End Use.
21. PennWell Publishing Company., *Oil and Gas Journal* (March 26, 1990)
22. PennWell Publishing Company., *Oil and Gas Journal* (October 16, 1989)
23. *Natural Gas Futures Handbook*, New York Mercantile Exchange, February 28, 1990.
24. For a more detailed analysis of the natural gas futures market, see Energy Information Administration Report, *Annual Outlook for Oil and Gas 1990*, Chapter 4, "The Developing Natural Gas Futures Market and Its Potential Impact on Domestic Natural Gas Markets" (Washington, DC, May, 1990).

Detailed Tables

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

	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply *															
Production															
U.S. (50 States)	10.12	10.02	9.77	9.57	9.70	9.54	9.44	9.48	9.45	9.23	9.14	9.21	9.87	9.54	9.26
OPEC	22.20	23.26	24.13	25.35	25.50	24.50	24.50	25.50	25.00	25.00	25.50	26.50	23.74	25.00	25.50
Other Non-OPEC	16.63	16.29	16.78	17.12	17.13	17.36	17.42	17.35	18.01	17.87	18.03	18.23	16.71	17.31	18.03
Total Market Economies	48.95	49.56	50.68	52.03	52.33	51.39	51.36	52.33	52.46	52.09	52.67	53.94	50.31	51.85	52.79
Net Centrally Planned Economies Exports	1.81	1.94	2.19	1.96	1.47	1.76	1.91	1.67	1.38	1.66	1.81	1.58	1.98	1.70	1.61
Total Supply	50.76	51.50	52.86	53.99	53.80	53.15	53.27	54.00	53.83	53.75	54.48	55.52	52.29	53.55	54.40
Net Stock Withdrawals or Additions (-)															
U.S. (50 States Excluding SPR)38	-.36	-.61	.97	-.38	-.09	-.23	.21	.41	-.32	-.28	.17	.09	-.12	-.01
U.S. SPR	-.07	-.06	-.06	-.03	-.02	-.04	-.04	-.06	-.06	-.06	-.06	-.05	-.06	-.04	-.06
Other Market Economies42	-.35	-.99	-.55	-.21	-.186	-.108	.60	1.06	-1.01	-.92	.46	-.37	-.64	-.11
Total Stock Withdrawals73	-.77	-1.66	.39	-.61	-1.98	-1.35	.75	1.41	-1.38	-1.26	.57	-.33	-.80	-.17
Product Supplied															
U.S. (50 States)	17.62	16.81	16.78	17.76	17.14	16.88	16.86	17.72	17.86	16.99	17.04	17.86	17.24	17.15	17.44
U.S. Territories20	.23	.19	.16	.18	.21	.20	.19	.19	.21	.20	.19	.19	.20	.20
Canada	1.86	1.67	1.75	1.86	1.62	1.70	1.78	1.88	1.74	1.73	1.82	1.91	1.73	1.74	1.80
Japan	5.46	4.47	4.60	5.42	5.82	4.59	4.77	5.67	6.00	4.76	4.96	5.88	4.98	5.21	5.40
Australia and New Zealand76	.79	.78	.80	.76	.81	.80	.82	.78	.82	.82	.84	.78	.80	.82
OECD Europe	12.62	11.97	12.21	13.19	12.93	11.99	12.50	13.20	13.11	12.18	12.70	13.41	12.50	12.66	12.85
Total OECD	38.32	35.93	36.31	39.17	38.45	36.17	36.92	39.47	39.68	36.71	37.54	40.09	37.43	37.76	38.50
Other Market Economies	14.51	14.59	14.60	14.88	15.16	15.25	15.26	15.56	15.85	15.95	15.96	16.28	14.65	15.31	16.01
Total Market Economies	52.82	50.52	50.91	54.04	53.61	51.43	52.18	55.03	55.53	52.66	53.49	56.37	52.07	53.06	54.51
Statistical Discrepancy	1.33	-.21	-.29	-.34	.42	.26	.26	.28	.29	.29	.27	.28	.11	.31	.28
Closing Stocks (billion barrels)	5.16	5.23	5.39	5.35	5.41	5.59	5.71	5.64	5.52	5.64	5.76	5.70	5.35	5.64	5.70

* 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, *International Petroleum Statistics Report*, DOE/EIA-0520(90/04); and *International Energy Annual 1988*, DOE/EIA-0219(88); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through September 1989.

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

	Annual Average 1978-1988	1989	1990	1991
OECD Total *	2.7	3.4	2.7	2.8
United States b	2.6	3.0	1.8	2.5
Western Europe	2.3	3.3	3.0	2.6
Japan	4.2	4.9	4.3	3.8
Other OECD c	3.2	2.9	1.0	2.9

* 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: DRI/McGraw-Hill Forecast CONTROL0390; Non-U.S. historical data and forecasts: The WEFA Group, *World Economic Service: Historical Data*, April 1989, and *World Economic Outlook: Developed Economies Volume*, April 1990.

Table 4. Macroeconomic, Oil Price, and Weather Assumptions

Assumption	1989				1990	Case	1990				1991				Year		
	1st	2nd	3rd	4th	1st		2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991	
Macroeconomic *																	
Real Gross National Product (billion 1982 dollars)	4,107	4,133	4,163	4,172	4,181	High	4,282	4,316	4,346	4,377	4,405	4,432	4,458	4,294	4,418		
						Base	4,211	4,231	4,257	4,287	4,315	4,341	4,366	4,144	4,220	4,327	
						Low	4,139	4,147	4,167	4,197	4,224	4,250	4,274		4,147	4,236	
Percentage Change from Prior Year	3.3	3.0	3.0	2.5	1.8	High	3.6	3.7	4.2	3.5	2.9	2.7	2.6	3.6	2.9		
						Base	1.9	1.6	2.0	2.5	2.5	2.6	2.6	3.0	1.8	2.5	
						Low	.2.	-.4	-.1	1.6	2.1	2.5	2.6		.1	2.2	
GNP Implicit Price Deflator (index, 1982=1.000)	1.245	1.259	1.269	1.279	1.296	High	1.300	1.309	1.319	1.333	1.346	1.359	1.371	1.305	1.352		
						Base	1.307	1.317	1.328	1.342	1.355	1.368	1.380	1.263	1.312	1.361	
						Low	1.314	1.326	1.337	1.351	1.364	1.377	1.390		1.320	1.371	
Percentage Change from Prior Year	4.4	4.4	4.1	3.7	4.1	High	3.2	3.1	3.1	3.2	3.6	3.8	3.9	3.3	3.6		
						Base	3.8	3.8	3.8	3.5	3.7	3.8	3.9	4.2	3.9	3.7	
						Low	4.3	4.5	4.5	3.8	3.8	3.9	3.9		4.5	3.9	
Real Disposable Personal Income ^b	2,882	2,888	2,919	2,939	2,948	High	3,011	3,024	3,032	3,046	3,052	3,060	3,073	3,013	3,058		
						Base	2,958	2,961	2,967	2,980	2,986	2,993	3,007	2,907	2,959	2,992	
						Low	2,905	2,899	2,901	2,914	2,920	2,927	2,941		2,904	2,926	
Percentage Change from Prior Year	4.5	4.1	4.0	3.6	2.3	High	4.3	3.6	3.2	2.1	1.4	1.2	1.4	3.7	1.5		
						Base	2.4	1.4	1.0	1.1	.9	1.1	1.4	4.1	1.8	1.1	
						Low	.6	-.7	-1.3	.1	.5	1.0	1.4		-.1	.7	
Index of Industrial Production (Mfg.)	1.470	1.483	1.488	1.484	1.485	High	1.559	1.582	1.593	1.607	1.622	1.634	1.643	1.565	1.627		
						Base	1.502	1.514	1.521	1.535	1.549	1.561	1.569	1.481	1.506	1.554	
						Low	1.444	1.446	1.449	1.462	1.476	1.487	1.495		1.446	1.480	
Percentage Change from Prior Year	5.3	4.7	3.4	1.8	1.0	High	5.2	6.3	7.4	5.5	4.0	3.3	3.1	5.6	4.0		
						Base	1.3	1.7	2.5	3.4	3.1	3.1	3.2	3.8	1.6	3.2	
						Low	-2.6	-2.9	-2.3	1.1	2.2	2.9	3.1		-2.3	2.3	
Oil Price																	
Imported Crude Oil Price ^c (U.S. dollars/barrel)	16.76	18.97	17.60	18.79	19.69	Low	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.90	16.00		
						Base	18.00	19.00	20.00	20.00	19.00	19.00	20.00	18.08	19.20	19.50	
						High	22.00	22.00	22.00	22.00	22.00	22.00	22.00		21.40	22.00	
Weather ^d																	
Heating Degree Days	2,289	560	96	1,894	2,028		536	88	1,669	2,401	536	88	1,669	4,839	4,322	4,694	
Cooling Degree Days	39	317	700	66	58		327	755	63	28	327	755	63	1,122	1,202	1,172	

* 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(90/01); 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 DRI/McGraw-Hill Forecast CONTROL0390.

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

Product	1989					1990	Price Range	1990			1991				Year			
	1st	2nd	3rd	4th	1st			2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991	
Imported Crude Oil Price ^a (dollars per barrel)	16.76	18.97	17.60	18.79	19.69	Low	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.90	16.00		
						Base	18.00	19.00	20.00	20.00	19.00	19.00	20.00	20.00	18.08	19.20	19.50	
						High	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00		21.40	22.00	
Natural Gas Wellhead Price (dollars per thousand cubic feet)	1.84	1.61	1.62	1.76	2.02	Low	1.64	1.68	1.83	2.00	1.72	1.75	1.90		1.80	1.85		
						Base	1.68	1.73	1.88	2.11	1.81	1.85	2.00		1.71	1.85	1.95	
						High	1.92	1.95	2.10	2.33	2.00	2.03	2.21			2.00	2.15	
Petroleum Products																		
Gasoline ^b (dollars per gallon)96	1.13	1.10	1.05	1.08	Low	1.13	1.10	1.05	1.00	1.06	1.09	1.03		1.09	1.05		
						Base	1.15	1.16	1.15	1.11	1.17	1.20	1.14		1.06	1.13	1.15	
						High	1.18	1.25	1.23	1.18	1.24	1.28	1.22			1.19	1.23	
No. 2 Diesel Oil, Retail (dollars per gallon)95	1.00	.95	1.06	1.12	Low	.97	.96	.98	.97	.97	.98	.99		.99	.98		
						Base	.99	1.00	1.04	1.04	1.03	1.02	1.05		.99	1.03	1.04	
						High	1.03	1.05	1.07	1.07	1.07	1.07	1.08			1.05	1.07	
No. 2 Heating Oil, Wholesale (dollars per gallon)53	.53	.53	.65	.77	Low	.49	.49	.52	.52	.49	.49	.53		.54	.51		
						Base	.54	.57	.64	.63	.57	.57	.64		.57	.64	.61	
						High	.64	.65	.69	.68	.65	.65	.70			.65	.67	
No. 2 Heating Oil, Retail (dollars per gallon)86	.86	.82	.96	1.06	Low	.89	.81	.85	.89	.85	.82	.87		.91	.86		
						Base	.92	.88	.96	1.01	.95	.91	.98		.90	.97	.97	
						High	.99	.97	1.03	1.08	1.03	1.00	1.05			1.02	1.05	
No. 6 Residual Fuel Oil ^c (dollars per barrel)	15.11	17.10	15.87	17.85	20.25	Low	15.62	15.22	15.66	15.94	15.02	15.21	15.68		16.73	15.52		
						Base	17.06	17.73	19.20	19.71	17.89	17.94	19.24		16.45	18.72	18.82	
						High	19.88	20.60	21.26	21.61	20.38	20.64	21.29			20.57	21.06	
Electric Utility Fuels																		
Coal (dollars per million Btu)	1.44	1.45	1.45	1.45	1.47	Low	1.45	1.43	1.42	1.44	1.46	1.43	1.43		1.44	1.44		
						Base	1.49	1.48	1.49	1.51	1.54	1.52	1.53		1.45	1.48	1.52	
						High	1.54	1.54	1.57	1.60	1.64	1.63	1.65			1.53	1.63	
Heavy Oil ^d (dollars per million Btu)	2.62	2.96	2.68	3.10	3.44	Low	2.64	2.60	2.70	2.76	2.56	2.61	2.71		2.84	2.66		
						Base	2.88	3.01	3.27	3.37	3.02	3.05	3.28		2.83	3.17	3.19	
						High	3.34	3.47	3.60	3.68	3.42	3.48	3.62			3.48	3.55	
Natural Gas (dollars per million Btu)	2.38	2.30	2.30	2.47	2.89	Low	2.45	2.39	2.53	2.72	2.43	2.42	2.58		2.52	2.52		
						Base	2.54	2.54	2.73	2.98	2.66	2.64	2.83		2.35	2.64	2.75	
						High	2.76	2.81	2.99	3.24	2.91	2.90	3.08			2.85	3.00	
Other Residential																		
Natural Gas (dollars per thousand cubic feet)	5.41	5.83	6.92	5.50	5.59	Low	6.12	7.14	5.97	5.88	6.48	7.54	6.27		5.93	6.21		
						Base	6.20	7.25	6.05	5.98	6.61	7.70	6.39		5.63	5.96	6.33	
						High	6.35	7.48	6.26	6.21	6.86	7.99	6.63			6.05	6.59	
Electricity (cents per kilowatthour)	7.19	7.77	8.07	7.56	7.38	Low	7.86	8.12	7.75	7.35	7.89	8.20	7.84		7.79	7.82		
						Base	7.95	8.26	7.93	7.58	8.17	8.50	8.14		7.84	7.89	8.10	
						High	8.11	8.48	8.16	7.84	8.48	8.85	8.50			8.02	8.42	

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

^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: First quarter 1990 is estimated. Prices exclude taxes, except gasoline, residential natural gas, and diesel prices. Price ranges are derived by simulating all energy product price models in STIFS under the assumptions of: low world oil prices (low price), base world oil prices (base price), and high world oil prices (high price), with macroeconomic and weather assumptions kept as in the base case for all price cases. Historical values are printed in **boldface**, forecasts in *italics*.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01); and *Petroleum Marketing Monthly*, DOE/EIA-0380(90/01).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Crude Oil Supply															
Domestic Production ^a	7.78	7.74	7.54	7.47	7.45	7.27	7.17	7.18	7.14	6.94	6.86	6.89	7.63	7.26	6.96
Alaska	1.87	1.91	1.82	1.90	1.83	1.75	1.72	1.77	1.76	1.66	1.60	1.66	1.87	1.77	1.67
Lower 48	5.92	5.83	5.72	5.57	5.61	5.52	5.45	5.41	5.38	5.29	5.26	5.23	5.76	5.50	5.29
Net Imports (Including SPR) ^b	5.09	5.60	6.16	5.79	5.91	5.83	6.13	6.30	6.11	6.39	6.60	6.68	5.67	6.04	6.45
Gross Imports (Excluding SPR)	5.18	5.71	6.20	5.90	6.06	5.97	6.23	6.40	6.23	6.51	6.68	6.79	5.75	6.17	6.55
SPR Imports	.07	.06	.06	.03	.02	.04	.04	.06	.06	.06	.06	.05	.06	.04	.06
Exports	.17	.17	.09	.14	.17	.17	.15	.16	.18	.17	.15	.16	.14	.16	.16
SPR Stock Withdrawn or Added (-)	-.07	-.06	-.06	-.03	-.02	-.04	-.04	-.06	-.06	-.06	-.06	-.05	-.06	-.04	-.06
Other Stock Withdrawn or Added (-)	.04	-.05	-.04	-.07	-.24	.14	.11	.03	-.05	-.04	.05	.01	-.03	.01	-.01
Products Supplied and Losses	-.05	-.02	-.02	-.03	-.03	-.02	-.02	-.02	-.02	-.02	-.02	-.02	-.03	-.02	-.02
Unaccounted-for Crude	.23	.21	.24	.18	.27	.11	.11	.13	.14	.14	.12	.13	.22	.16	.13
Crude Oil Input to Refineries	13.03	13.41	13.83	13.31	13.34	13.29	13.46	13.56	13.26	13.36	13.55	13.64	13.40	13.41	13.45
Other Supply															
NGL Production	1.64	1.60	1.51	1.44	1.56	1.55	1.54	1.57	1.59	1.56	1.54	1.57	1.55	1.55	1.56
Other Hydrocarbon and Alcohol Inputs	.05	.05	.07	.06	.06	.06	.06	.06	.06	.06	.06	.06	.07	.06	.06
Crude Oil Product Supplied	.05	.02	.02	.03	.03	.02	.02	.02	.02	.02	.02	.02	.03	.02	.02
Processing Gain	.65	.63	.64	.60	.64	.66	.67	.68	.67	.68	.68	.69	.63	.66	.68
Net Product Imports ^c	1.85	1.40	1.29	1.28	1.66	1.52	1.45	1.65	1.81	1.60	1.51	1.72	1.45	1.57	1.66
Gross Product Imports ^c	2.52	2.09	2.00	2.08	2.32	2.08	1.99	2.26	2.40	2.16	2.05	2.33	2.17	2.16	2.23
Product Exports	.66	.69	.71	.80	.65	.56	.53	.61	.59	.56	.53	.61	.72	.59	.57
Product Stock Withdrawn or Added (-) ^d	.34	-.31	-.57	1.04	-.14	-.22	-.34	.17	.46	-.28	-.33	.15	.12	-.13	.00
Total Product Supplied, Domestic Use	17.61	16.81	16.78	17.76	17.14	16.88	16.86	17.72	17.86	16.99	17.04	17.86	17.24	17.15	17.44
Disposition															
Motor Gasoline	7.08	7.46	7.42	7.34	6.96	7.55	7.48	7.31	7.01	7.57	7.50	7.35	7.33	7.33	7.36
Jet Fuel	1.50	1.40	1.46	1.58	1.48	1.45	1.47	1.60	1.58	1.46	1.48	1.63	1.49	1.50	1.54
Distillate Fuel Oil	3.38	2.98	2.82	3.44	3.25	2.99	2.84	3.24	3.59	3.05	2.90	3.29	3.15	3.08	3.21
Residual Fuel Oil	1.60	1.24	1.12	1.44	1.40	1.09	1.05	1.57	1.44	1.03	1.04	1.49	1.35	1.28	1.25
Other Oils Supplied ^e	4.06	3.75	3.96	3.95	4.05	3.81	4.03	4.01	4.25	3.89	4.11	4.10	3.93	3.97	4.09
Total Product Supplied	17.62	16.81	16.78	17.76	17.14	16.88	16.86	17.72	17.86	16.99	17.04	17.86	17.24	17.15	17.44
Total Petroleum Net Imports	6.95	7.01	7.45	7.07	7.57	7.35	7.58	7.96	7.92	8.00	8.11	8.39	7.12	7.62	8.11
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	326	331	335	341	363	351	341	338	343	346	341	340	341	338	340
Total Motor Gasoline	230	217	227	214	231	217	223	229	235	219	225	230	214	229	230
Finished Motor Gasoline	189	178	186	177	187	181	184	193	199	184	187	195	177	193	195
Blending Components	41	38	41	36	44	36	38	36	36	35	38	35	36	36	35
Jet Fuel	44	45	49	41	48	48	48	45	44	46	47	44	41	45	44
Distillate Fuel Oil	97	99	122	106	98	103	120	127	95	102	121	130	106	127	130
Residual Fuel Oil	42	45	50	44	46	45	44	45	41	41	41	44	44	45	44
Other Oils ^g	264	300	310	258	251	283	291	264	253	285	290	262	258	264	262
Total Stocks (Excluding SPR)	1003	1036	1092	1003	1038	1046	1067	1048	1011	1040	1066	1050	1003	1048	1050
Crude Oil in SPR	566	572	577	580	581	585	589	594	599	605	610	615	580	594	615
Total Stocks (Including SPR)	1569	1608	1670	1583	1619	1631	1655	1641	1610	1644	1676	1665	1583	1641	1665

^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 Jan. 1990; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

Table 7. Petroleum Demand Sensitivities

Demand Determinant	1990	1991
	Three Quarters	Four Quarters
Economic Activity		
Level of GNP ^a	4,147 - 4,294	4,236 - 4,418
Resulting Petroleum Demand Difference ^b37	.56
Energy Prices		
Crude Oil ^c	\$16.90 - \$21.40	\$16 - \$22
Resulting Petroleum Demand Difference ^b		
All Energy Prices Change10	.19
Only Oil Prices Change32	.48
Weather		
Heating Degree-Days ^d	3,901 - 4,856	3,949 - 5,614
Cooling Degree-Days ^d	1,023 - 1,431	991 - 1,411
Resulting Petroleum Demand Difference ^b28	.46

^a Real gross national product, in billions of 1982 dollars per year.^b Petroleum demand ranges associated with varying each particular demand determinant (or set of demand determinants), holding other things equal, in million barrels per day.^c Imported refiners' acquisition cost of oil, in current dollars per barrel.^d Heating and cooling degree-days shown are national population-weighted.

Source: Energy Information Administration, Office of Energy Markets and End Use, Demand Analysis and Forecasting Branch.

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Crude Oil Supply															
Domestic Production ^a	7.78	7.74	7.54	7.47	7.45	7.18	7.04	7.03	6.97	6.75	6.61	6.62	7.63	7.17	6.74
Alaska	1.87	1.91	1.82	1.90	1.83	1.73	1.70	1.74	1.72	1.61	1.55	1.60	1.87	1.75	1.62
Lower 48	5.92	5.83	5.72	5.57	5.61	5.45	5.34	5.29	5.25	5.14	5.06	5.02	5.76	5.42	5.12
Net Imports (Including SPR) ^b	5.09	5.60	6.16	5.79	5.91	6.09	6.60	6.84	6.59	6.85	7.19	7.34	5.67	6.36	7.00
Gross Imports (Excluding SPR)	5.18	5.71	6.20	5.90	6.06	6.22	6.71	6.94	6.71	6.96	7.28	7.45	5.75	6.48	7.10
SPR Imports	.07	.06	.06	.03	.02	.04	.04	.06	.06	.06	.06	.05	.06	.04	.06
Exports	.17	.17	.09	.14	.17	.17	.15	.16	.18	.17	.15	.16	.14	.16	.16
SPR Stock Withdrawn or Added (-)	-.07	-.06	-.06	-.03	-.02	-.04	-.04	-.06	-.06	-.06	-.05	-.05	-.06	-.04	-.06
Other Stock Withdrawn or Added (-)	.04	-.05	-.04	-.07	-.24	.19	.02	.00	.00	.00	.00	.00	-.03	-.01	.00
Products Supplied and Losses	-.05	-.02	-.02	-.03	-.03	-.02	-.02	-.02	-.02	-.02	-.02	-.02	-.03	-.02	-.02
Unaccounted-for Crude	.23	.21	.24	.18	.27	.10	.13	.13	.13	.13	.13	.13	.22	.16	.13
Crude Oil Input to Refineries	13.03	13.41	13.83	13.31	13.34	13.50	13.72	13.92	13.62	13.65	13.86	14.02	13.40	13.62	13.79
Other Supply															
NGL Production	1.64	1.60	1.51	1.44	1.56	1.56	1.54	1.58	1.61	1.56	1.55	1.58	1.55	1.56	1.57
Other Hydrocarbon and Alcohol Inputs	.05	.05	.07	.06	.06	.06	.06	.06	.06	.06	.06	.07	.06	.06	.06
Crude Oil Product Supplied	.05	.02	.02	.03	.03	.02	.02	.02	.02	.02	.02	.02	.03	.02	.02
Processing Gain	.65	.63	.64	.60	.64	.68	.70	.71	.71	.70	.71	.72	.63	.68	.71
Net Product Imports ^c	1.85	1.40	1.29	1.28	1.66	1.62	1.73	1.93	2.17	1.81	1.78	1.98	1.45	1.74	1.94
Gross Product Imports ^c	2.52	2.09	2.00	2.08	2.32	2.18	2.27	2.54	2.75	2.37	2.32	2.59	2.17	2.33	2.51
Product Exports	.66	.69	.71	.80	.65	.56	.53	.61	.59	.56	.53	.61	.72	.59	.57
Product Stock Withdrawn or Added (-) ^d	.34	-.31	-.57	1.04	-.14	-.19	-.50	.29	.48	-.29	-.45	.30	.12	-.13	.01
Total Product Supplied, Domestic Use	17.61	16.81	16.78	17.76	17.14	17.25	17.28	18.52	18.66	17.51	17.53	18.69	17.24	17.55	18.10
Disposition															
Motor Gasoline	7.08	7.46	7.42	7.34	6.96	7.59	7.53	7.36	7.07	7.65	7.59	7.43	7.33	7.36	7.44
Jet Fuel	1.50	1.40	1.46	1.58	1.48	1.49	1.53	1.68	1.66	1.53	1.55	1.71	1.49	1.55	1.61
Distillate Fuel Oil	3.38	2.98	2.82	3.44	3.25	3.11	2.96	3.55	3.88	3.21	3.03	3.60	3.15	3.22	3.43
Residual Fuel Oil	1.60	1.24	1.12	1.44	1.40	1.19	1.18	1.77	1.62	1.15	1.18	1.69	1.35	1.38	1.41
Other Oils Supplied ^e	4.06	3.75	3.96	3.95	4.05	3.88	4.09	4.16	4.43	3.98	4.18	4.26	3.93	4.04	4.21
Total Product Supplied	17.62	16.81	16.78	17.76	17.14	17.25	17.28	18.52	18.66	17.51	17.53	18.69	17.24	17.55	18.10
Total Petroleum Net Imports	6.95	7.01	7.45	7.07	7.57	7.71	8.33	8.77	8.76	8.66	8.98	9.33	7.12	8.10	8.93
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	326	331	335	341	363	346	344	344	344	344	344	344	341	344	344
Total Motor Gasoline	230	217	227	214	231	218	228	231	235	221	228	231	214	231	231
Finished Motor Gasoline	189	178	186	177	187	183	190	195	198	185	190	194	177	195	194
Blending Components	41	38	41	36	44	36	39	37	37	36	38	37	36	37	37
Jet Fuel	44	45	49	41	48	45	46	44	45	45	46	44	41	44	44
Distillate Fuel Oil	97	99	122	106	98	106	131	136	100	106	131	135	106	136	135
Residual Fuel Oil	42	45	50	44	46	42	45	46	41	42	45	46	44	46	46
Other Oils ^g	264	300	310	258	251	280	287	253	247	279	286	252	258	253	252
Total Stocks (Excluding SPR)	1003	1036	1092	1003	1038	1037	1082	1055	1011	1038	1080	1053	1003	1055	1053
Crude Oil in SPR	566	572	577	580	581	585	589	594	599	605	610	615	580	594	615
Total Stocks (Including SPR)	1569	1608	1670	1583	1619	1622	1670	1649	1611	1643	1690	1668	1583	1649	1668

^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 Jan. 1990; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Crude Oil Supply															
Domestic Production ^a	7.78	7.74	7.54	7.47	7.45	7.41	7.36	7.29	7.30	7.10	6.99	7.01	7.63	7.38	7.10
Alaska	1.87	1.91	1.82	1.90	1.83	1.82	1.82	1.79	1.78	1.69	1.64	1.70	1.87	1.82	1.70
Lower 48	5.92	5.83	5.72	5.57	5.61	5.60	5.53	5.50	5.51	5.41	5.35	5.32	5.76	5.56	5.40
Net Imports (Including SPR) ^b	5.09	5.60	6.16	5.79	5.91	5.17	5.53	5.74	5.51	5.81	6.03	6.08	5.67	5.59	5.86
Gross Imports (Excluding SPR)	5.18	5.71	6.20	5.90	6.06	5.30	5.64	5.84	5.63	5.93	6.11	6.19	5.75	5.71	5.97
SPR Imports	.07	.06	.06	.03	.02	.04	.04	.06	.06	.06	.06	.05	.06	.04	.06
Exports	.17	.17	.09	.14	.17	.17	.15	.16	.18	.17	.15	.16	.14	.16	.16
SPR Stock Withdrawn or Added (-)	-.07	-.06	-.06	-.03	-.02	-.04	-.04	-.06	-.06	-.06	-.06	-.05	-.06	-.04	-.06
Other Stock Withdrawn or Added (-)	.04	-.05	-.04	-.07	-.24	.30	.09	.04	-.05	-.04	.06	.03	-.03	.05	.00
Products Supplied and Losses	-.05	-.02	-.02	-.03	-.03	-.02	-.03	-.02	-.02						
Unaccounted-for Crude	.23	.21	.24	.18	.27	.08	.12	.13	.14	.14	.12	.13	.22	.15	.13
Crude Oil Input to Refineries	13.03	13.41	13.83	13.31	13.34	12.91	13.04	13.12	12.82	12.93	13.12	13.19	13.40	13.10	13.02
Other Supply															
NGL Production	1.64	1.60	1.51	1.44	1.56	1.55	1.54	1.55	1.57	1.55	1.54	1.56	1.55	1.55	1.55
Other Hydrocarbon and Alcohol Inputs	.05	.05	.07	.06											
Crude Oil Product Supplied	.05	.02	.02	.03	.03	.02	.03	.02	.02						
Processing Gain	.65	.63	.64	.60	.64	.64	.65	.65	.64	.65	.66	.63	.64	.65	
Net Product Imports ^c	1.85	1.40	1.29	1.28	1.66	1.36	1.51	1.50	1.59	1.60	1.57	1.53	1.45	1.51	1.57
Gross Product Imports ^c	2.52	2.09	2.00	2.08	2.32	1.92	2.05	2.11	2.17	2.16	2.11	2.14	2.17	2.10	2.15
Product Exports	.66	.69	.71	.80	.65	.56	.53	.61	.59	.56	.53	.61	.72	.59	.57
Product Stock Withdrawn or Added (-) ^d	.34	-.31	-.57	1.04	-.14	-.03	-.35	.17	.50	-.27	-.36	.17	.12	-.09	.01
Total Product Supplied, Domestic Use	17.61	16.81	16.78	17.76	17.14	16.51	16.48	17.06	17.19	16.54	16.62	17.19	17.24	16.80	16.89
Disposition															
Motor Gasoline	7.08	7.46	7.42	7.34	6.96	7.51	7.43	7.25	6.94	7.49	7.43	7.28	7.33	7.29	7.29
Jet Fuel	1.50	1.40	1.46	1.58	1.48	1.39	1.40	1.53	1.51	1.40	1.42	1.56	1.49	1.45	1.47
Distillate Fuel Oil	3.38	2.98	2.82	3.44	3.25	2.87	2.73	2.98	3.36	2.92	2.79	3.04	3.15	2.96	3.03
Residual Fuel Oil	1.60	1.24	1.12	1.44	1.40	.99	.94	1.43	1.31	.93	.94	1.35	1.35	1.19	1.13
Other Oils Supplied ^e	4.06	3.75	3.96	3.95	4.05	3.74	3.97	3.87	4.07	3.81	4.04	3.96	3.93	3.91	3.97
Total Product Supplied	17.62	16.81	16.78	17.76	17.14	16.51	16.48	17.06	17.19	16.54	16.62	17.19	17.24	16.80	16.89
Total Petroleum Net Imports	6.95	7.01	7.45	7.07	7.57	6.53	7.05	7.23	7.10	7.42	7.60	7.61	7.12	7.09	7.43
Closing Stocks (million barrels)															
Crude Oil (Excluding SPR) ^f	326	331	335	341	363	336	327	324	329	333	327	324	341	324	324
Total Motor Gasoline	230	217	227	214	231	211	217	224	229	211	217	223	214	224	223
Finished Motor Gasoline	189	178	186	177	187	177	180	189	195	179	181	189	177	189	189
Blending Components	41	38	41	36	44	34	37	35	35	32	35	34	36	35	34
Jet Fuel	44	45	49	41	48	46	46	45	44	45	45	44	41	45	44
Distillate Fuel Oil	97	99	122	106	98	102	125	131	94	101	125	131	106	131	131
Residual Fuel Oil	42	45	50	44	46	38	37	39	37	38	37	39	44	39	39
Other Oils ^g	264	300	310	258	251	280	284	255	245	278	283	254	258	255	254
Total Stocks (Excluding SPR)	1003	1036	1092	1003	1038	1012	1036	1018	977	1006	1034	1014	1003	1018	1014
Crude Oil in SPR	566	572	577	580	581	585	589	594	599	605	610	615	580	594	615
Total Stocks (Including SPR)	1569	1608	1670	1583	1619	1597	1625	1611	1577	1611	1644	1629	1583	1611	1629

^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 Jan. 1990; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Domestic Production ^a	6.74	7.01	7.19	6.92	6.79	7.06	7.12	7.08	6.77	7.02	7.14	7.10	6.97	7.02	7.01
Imports	.37	.37	.36	.35	.33	.43	.41	.33	.32	.39	.41	.34	.36	.38	.36
Exports	.03	.05	.05	.03	.05	.01	.01	.01	.01	.01	.01	.01	.04	.02	.01
Net Imports	.34	.33	.31	.32	.28	.42	.40	.32	.31	.38	.39	.33	.32	.35	.35
Net Withdrawals	.01	.12	-.08	.10	-.11	.07	-.04	-.09	-.07	.17	-.03	-.08	.03	-.04	.00
Total Primary Supply	7.08	7.46	7.42	7.34	6.96	7.55	7.48	7.31	7.01	7.57	7.50	7.35	7.33	7.33	7.36
Disposition															
Leaded	1.00	.92	.80	.60	.44	.50	.46	.42	.37	.37	.33	.30	.83	.45	.34
Unleaded	6.08	6.54	6.62	6.75	6.53	7.05	7.02	6.89	6.64	7.20	7.17	7.05	6.50	6.87	7.02
Total Product Supplied	7.08	7.46	7.42	7.34	6.96	7.55	7.48	7.31	7.01	7.57	7.50	7.35	7.33	7.33	7.36
Stocks															
Primary Finished Stock Levels ^b (million barrels)	189.9	189.0	178.4	186.0	177.1	187.0	180.6	184.5	192.8	199.0	183.9	186.9	189.9	177.1	192.8
Opening	189.9	189.0	178.4	186.0	177.1	187.0	180.6	184.5	192.8	199.0	183.9	186.9	194.6	177.1	192.8
Closing	189.0	178.4	186.0	177.1	187.0	180.6	184.5	192.8	199.0	183.9	186.9	194.6	177.1	192.8	194.6

^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 Jan. 1990; *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Refinery Output	2.83	2.78	2.90	3.08	2.86	2.81	2.82	3.04	3.01	2.88	2.88	3.11	2.90	2.88	2.97
Imports37	.27	.28	.29	.39	.28	.29	.34	.33	.31	.30	.35	.30	.32	.32
Exports11	.05	.11	.11	.07	.06	.07	.07	.09	.06	.07	.07	.10	.07	.07
Net Imports25	.23	.17	.18	.31	.22	.21	.27	.23	.25	.23	.28	.21	.26	.25
Net Withdrawals30	-.03	-.25	.18	.08	-.05	-.19	-.08	.35	-.08	-.20	-.10	.05	-.06	-.01
Disposition															
Electric Utility Consumption08	.05	.06	.09	.05	.05	.05	.06	.05	.05	.05	.06	.07	.05	.05
Utility Stock Additions	-.02	.01	.00	-.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Electric Utility Shipments06	.06	.06	.08	.06	.05	.05	.06	.05	.05	.05	.05	.07	.06	.05
Nonutility Shipments	3.32	2.91	2.76	3.36	3.19	2.94	2.79	3.17	3.55	3.01	2.85	3.23	3.09	3.02	3.16
Total Product Supplied	3.38	2.98	2.82	3.44	3.25	2.99	2.84	3.24	3.59	3.05	2.90	3.29	3.15	3.08	3.21
Stocks															
Electric Utility Stock Levels (million barrels)	15.1	13.4	14.6	14.8	13.8	15.0	14.9	14.8	14.6	14.5	14.4	14.3	15.1	13.8	14.6
Opening	15.1	13.4	14.6	14.8	13.8	15.0	14.9	14.8	14.6	14.5	14.4	14.3	15.1	13.8	14.6
Closing	13.4	14.6	14.8	13.8	15.0	14.9	14.8	14.6	14.5	14.4	14.3	14.2	13.8	14.6	14.2
Primary Stock Levels (million barrels)	123.5	96.6	99.4	122.2	105.6	98.2	102.7	119.8	127.1	95.2	102.4	120.9	123.5	105.6	127.1
Opening	123.5	96.6	99.4	122.2	105.6	98.2	102.7	119.8	127.1	95.2	102.4	120.9	123.5	105.6	127.1
Closing	96.6	99.4	122.2	105.6	98.2	102.7	119.8	127.1	95.2	102.4	120.9	123.5	105.6	127.1	129.8

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 Jan. 1990; *Monthly Energy Review*, DOE/EIA-0035(90/01); *Electric Power Monthly*, DOE/EIA-0226(90/01); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Refinery Output	0.94	0.93	0.87	1.07	1.06	0.83	0.86	1.06	0.95	0.82	0.85	1.03	0.95	0.95	0.91
Imports81	.57	.48	.58	.57	.43	.35	.73	.64	.40	.36	.69	.61	.52	.52
Exports17	.24	.18	.27	.19	.19	.16	.21	.20	.19	.16	.21	.21	.19	.19
Net Imports64	.33	.30	.31	.37	.24	.19	.51	.44	.20	.19	.48	.40	.33	.33
Net Withdrawals02	-.03	-.05	.06	-.03	.02	.01	-.01	.04	.00	-.01	-.03	.00	.00	.00
Disposition															
Electric Utility Consumption84	.58	.56	.67	.60	.51	.54	.69	.53	.51	.56	.67	.66	.59	.57
Utility Stock Additions	-.10	.07	.03	-.07	.04	.01	.00	-.01	.02	-.01	.01	-.01	-.02	.01	.00
Electric Utility Shipments74	.65	.59	.60	.65	.52	.54	.68	.55	.50	.57	.65	.64	.60	.57
Nonutility Shipments87	.58	.54	.84	.75	.57	.51	.89	.88	.53	.47	.84	.71	.68	.68
Total Product Supplied	1.60	1.24	1.12	1.44	1.40	1.09	1.05	1.57	1.44	1.03	1.04	1.49	1.35	1.28	1.25
Stocks															
Electric Utility Stock Levels (million barrels)															
Opening	54.2	45.1	51.9	54.3	47.6	51.6	52.6	52.5	51.3	53.1	52.5	53.4	54.2	47.6	51.3
Closing	45.1	51.9	54.3	47.6	51.6	52.6	52.5	51.3	53.1	52.5	53.4	52.1	47.6	51.3	52.1
Primary Stock Levels (million barrels)															
Opening	44.6	42.4	44.8	49.5	43.8	46.3	44.6	43.9	44.8	41.1	40.7	41.2	44.6	43.8	44.8
Closing	42.4	44.8	49.5	43.8	46.3	44.6	43.9	44.8	41.1	40.7	41.2	43.7	43.8	44.8	43.7

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 Jan. 1990; *Monthly Energy Review*, DOE/EIA-0035(90/01); *Electric Power Monthly*, DOE/EIA-0226(90/01); *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

Table 13. Supply and Disposition of Other Petroleum Products:^a Base Case
 (Million Barrels per Day, Except Stocks)

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Net Refinery Output ^b	3.18	3.32	3.51	2.85	3.27	3.25	3.33	3.06	3.20	3.31	3.36	3.09	3.21	3.23	3.24
Natural Gas Plant Output	1.64	1.60	1.51	1.44	1.56	1.55	1.54	1.57	1.59	1.56	1.54	1.57	1.55	1.55	1.56
Other Domestic ^c	.05	.05	.07	.06	.06	.06	.06	.06	.06	.06	.06	.07	.06	.06	.06
Net Imports	.62	.52	.51	.47	.70	.64	.65	.55	.82	.77	.70	.63	.53	.63	.73
Net Withdrawals	.01	-.37	-.19	.70	-.08	-.26	-.11	.35	.13	-.37	-.09	.36	.04	-.03	.01
Total Primary Supply	5.50	5.12	5.41	5.51	5.50	5.23	5.47	5.59	5.80	5.33	5.57	5.71	5.38	5.45	5.60
Disposition															
Jet Fuel	1.50	1.40	1.46	1.58	1.48	1.45	1.47	1.60	1.58	1.46	1.48	1.63	1.49	1.50	1.54
Liquefied Petroleum Gas ^d	1.97	1.42	1.45	1.83	1.77	1.39	1.45	1.79	2.02	1.41	1.47	1.82	1.66	1.60	1.68
Petrochemical Feedstocks ^e	.48	.45	.44	.41	.50	.47	.45	.43	.51	.49	.47	.45	.44	.46	.48
Miscellaneous ^f	1.57	1.85	2.06	1.69	1.75	1.93	2.11	1.77	1.69	1.97	2.16	1.81	1.79	1.89	1.91
Total Product Supplied	5.52	5.12	5.41	5.50	5.50	5.23	5.47	5.59	5.80	5.33	5.57	5.71	5.39	5.45	5.60
Stocks															
Primary Stocks (million barrels)															
Opening	349.4	348.9	382.4	399.6	335.4	343.0	367.0	377.5	344.9	332.9	366.5	375.2	349.4	335.4	344.9
Closing	348.9	382.4	399.6	335.4	343.0	367.0	377.5	344.9	332.9	366.5	375.2	342.0	335.4	344.9	342.0

^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 February and March 1990 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 Jan. 1990; and *Weekly Petroleum Status Report*, DOE/EIA-0208(89-50,90-11,15).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Total Dry Gas Production ^a	4.42	4.17	4.08	4.37	4.58	4.29	4.15	4.58	4.71	4.32	4.18	4.63	17.04	17.61	17.84
Net Imports	.33	.31	.31	.37	.44	.35	.32	.36	.43	.37	.34	.39	1.31	1.47	1.53
Supplemental Gaseous Fuels	.05	.04	.03	.04	.05	.04	.04	.05	.05	.04	.04	.05	.16	.18	.17
Total New Supply	4.79	4.51	4.42	4.79	5.07	4.68	4.51	5.00	5.19	4.74	4.56	5.06	18.50	19.26	19.54
Underground Working Gas Storage															
Opening	2.85	1.78	2.37	3.18	2.50	1.67	2.25	3.07	2.69	1.65	2.22	3.04	2.85	2.50	2.69
Closing	1.78	2.37	3.18	2.50	1.67	2.25	3.07	2.69	1.65	2.22	3.04	2.67	2.50	2.69	2.67
Net Withdrawals ^b	1.09	-58	-84	.68	.77	-58	-82	.98	1.05	-58	-82	.38	.36	-25	.03
Total Primary Supply ^a	5.88	3.93	3.58	5.47	5.84	4.11	3.69	5.37	6.23	4.16	3.74	5.43	18.86	19.01	19.57
Consumption															
Lease and Plant Fuel	.31	.29	.28	.30	.38	.30	.28	.32	.35	.30	.29	.33	1.18	1.28	1.27
Pipeline Use	.15	.13	.15	.17	.17	.14	.13	.15	.17	.14	.14	.16	.59	.60	.60
Residential	2.18	.85	.40	1.42	2.09	.87	.36	1.27	2.31	.88	.37	1.29	4.84	4.59	4.85
Commercial	1.11	.52	.33	.76	1.05	.52	.33	.71	1.16	.52	.33	.72	2.73	2.61	2.74
Industrial	1.79	1.66	1.61	1.78	1.95	1.66	1.57	1.80	1.96	1.70	1.61	1.84	6.84	6.98	7.11
Electric Utilities	.53	.74	.89	.61	.51	.75	.91	.59	.56	.76	.91	.62	2.77	2.76	2.85
Subtotal	6.06	4.20	3.66	5.03	6.15	4.23	3.59	4.85	6.52	4.30	3.65	4.96	18.95	18.81	19.42
Total Disposition	5.88	3.93	3.58	5.47	5.84	4.11	3.69	5.37	6.23	4.16	3.74	5.43	18.86	19.01	19.57
Unaccounted for	-18	-26	-08	.44	-31	-12	.10	.53	-28	-14	.09	.48	-09	.20	.15

^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(90/01); *Natural Gas Monthly*, DOE/EIA-0130(90/01); and *Electric Power Monthly*, DOE/EIA-0226(90/01).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Supply															
Production	247	239	243	251	263	240	242	254	239	266	260	272	980	999	1038
Primary Stock Levels ^a															
Opening	30	35	30	29	29	28	27	27	27	27	27	27	30	29	27
Closing	35	30	29	29	28	27	27	27	27	27	27	27	29	27	27
Net Withdrawals	-5	5	2	0	1	1	0	0	0	0	0	0	1	2	0
Imports	1	1	1	1	1	1	1	1	0	1	1	1	3	2	2
Exports	21	28	24	27	21	25	26	26	21	25	26	26	101	98	99
Total New Domestic Supply	221	216	221	225	244	216	217	229	219	242	234	247	883	906	941
Secondary Stock Levels ^b															
Opening	158	149	159	147	146	172	168	146	144	138	151	137	158	146	144
Closing	149	159	147	146	172	168	146	144	138	151	137	145	146	144	145
Net Withdrawals	9	-10	12	1	-25	4	22	2	6	-14	14	-7	12	2	-1
Total Indicated Consumption	230	206	233	226	218	220	238	231	225	228	248	239	895	908	941
Consumption															
Coke Plants	11	11	10	10	10	10	10	10	10	10	10	10	41	40	41
Electric Utilities	191	178	203	194	187	191	209	199	193	198	218	207	766	786	817
Retail and General Industry ^c	22	19	19	22	21	19	20	22	22	19	20	22	82	82	83
Subtotal	223	208	232	226	218	220	238	231	225	228	248	239	889	908	941
Total Disposition	230	206	233	226	218	220	238	231	225	228	248	239	895	908	941
Discrepancy ^d	7	-2	1	0	0	0	0	0	0	0	0	0	6	0	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, 1990, and 1991.

^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(90/01); and *Quarterly Coal Report*, DOE/EIA-0121(89/4Q).

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

Supply and Disposition	1989				1990				1991				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1989	1990	1991
Net Utility Generation															
Coal	388.9	362.7	406.9	393.4	377.9	390.1	422.3	404.7	392.9	405.4	441.3	421.4	1551.9	1595.0	1661.0
Petroleum	49.7	34.1	33.1	41.3	35.1	30.0	32.1	41.2	31.1	29.9	33.4	39.7	158.2	138.5	134.0
Natural Gas	50.4	70.6	85.1	58.9	48.7	72.0	86.9	56.0	53.6	72.2	87.4	59.1	265.0	263.5	272.3
Nuclear Power	124.7	114.8	152.1	137.7	139.0	126.1	144.1	132.7	141.9	127.0	143.0	134.4	529.4	541.9	546.3
Hydropower	62.2	78.0	61.8	63.1	66.8	77.6	65.5	67.5	77.6	81.0	66.8	67.5	265.1	277.5	292.9
Geothermal Power and Other ^a	2.8	2.8	2.8	2.9	3.0	3.1	3.2	3.2	3.2	3.2	3.4	3.4	11.3	12.5	13.2
Total Utility Generation	678.7	663.0	741.9	697.2	670.5	699.0	754.1	705.3	700.3	718.7	775.2	725.4	2780.8	2828.9	2919.7
Net Imports	4.4	5.0	5.0	-2.1	1.4	5.5	8.1	7.0	7.1	7.2	9.2	8.6	12.2	22.1	32.1
Purchases from Nonutilities ^b	19.4	19.0	21.3	20.0	22.4	22.0	24.6	23.1	25.4	24.9	27.9	26.2	79.8	92.1	104.3
Total Supply	702.5	687.0	768.2	715.1	694.4	726.4	786.8	735.4	732.8	750.8	812.3	760.2	2872.8	2943.0	3056.1
Losses and Unaccounted For ^c	48.5	65.6	56.9	68.1	32.0	86.4	47.3	72.4	33.1	89.7	49.6	75.3	239.0	238.1	247.8
Sales															
Residential	241.1	197.2	250.7	215.5	240.9	205.6	266.2	219.5	262.4	213.2	275.6	227.7	904.5	932.1	978.9
Commercial	175.4	173.3	199.8	175.4	181.7	181.5	210.0	183.2	192.4	190.1	218.9	191.9	723.8	756.5	793.4
Industrial	215.4	228.9	237.0	233.5	216.4	230.7	239.5	237.2	221.3	235.2	244.1	241.8	914.8	923.9	942.3
Other	22.1	22.1	23.9	22.6	23.3	22.3	23.8	23.1	23.6	22.6	24.1	23.5	90.7	92.5	93.7
Total	654.0	621.4	711.3	647.0	662.4	640.1	739.5	663.0	699.7	661.1	762.7	684.9	2633.8	2705.0	2808.4

^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(90/01); and *Electric Power Monthly*, DOE/EIA-0226(90/01).

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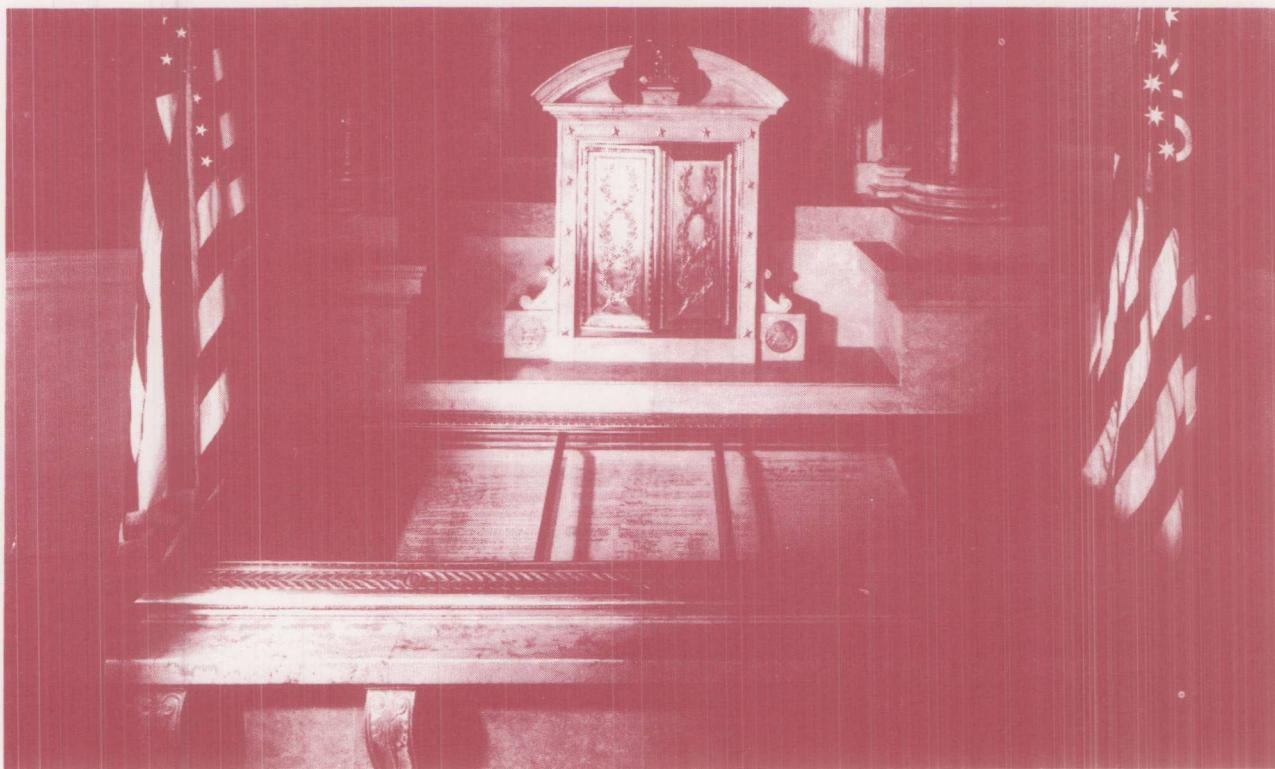
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