Short-Term Energy Outlook

Quarterly Projections

February 1984

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Preface

The Energy Information Administration (EIA) quarterly forecasts of short-term energy supply, demand, and prices are revised in February, May, August, and November for publication in the Short-Term Energy Outlook (Outlook). Methodology volumes, which are published periodically, contain descriptions of the forecasting system and detailed analyses of current issues that affect EIA's short-term energy forecasts. The principal users of the Outlook are managers and energy analysts in private industry and government. The projections in this volume extend through the first half of 1985.

The forecasts are produced using the Short-Term Integrated Forecasting System (STIFS). The STIFS model uses two principal driving variables: a macroeconomic forecast and the world oil price assumptions. Macroeconomic forecasts produced by Data Resources, Incorporated, (DRI) are adjusted by EIA to reflect EIA projections of the world price of crude oil, which differ from DRI estimates. EIA's Oil Market Simulation Model is used to project the world oil prices.

The three projections for petroleum supply and demand are based on low, medium, and high economic growth scenarios which incorporate high, medium, and low crude oil price trajectories. The discussion and tables in this volume primarily refer to the medium, or base case, scenario and, unless otherwise noted, refer to the domestic situation. Other cases examining the sensitivity of total petroleum demand to varying assumptions about prices, weather, and economic activity are shown in Table 9.

The forecasts and historical data are based on EIA data published in the Monthly Energy Review, Petroleum Supply Monthly, and other EIA publications.

The appearance of this Outlook is slightly different from previous editions because of production changes made to expedite the publication process. As a result, the release date for this forecast is about 3 weeks earlier than for previous editions. We hope the new schedule will be helpful to our readers.

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1. Highlights

Domestic petroleum demand in 1984 is expected to show an increase, on an annual basis, for the first time since 1978. Due to the projected continuation of the current economic recovery, domestic petroleum consumption in 1984 is expected to average 15.7 million barrels per day, a 3.4-percent increase over estimated 1983 demand of 15.2 million barrels per day. (The base case projections are summarized on Table 1.) Domestic petroleum consumption in the first half of 1985 is projected to average 15.9 million barrels per day.

Compared to the November 1983 Outlook forecast, projected domestic demand for petroleum in 1984 is down slightly, despite a slightly higher real disposable personal income and a slightly lower world oil price. This downward revision primarily reflects a somewhat lower forecast for industrial production and a revised estimate for the demand for nonutility residual fuel. Data for the third and fourth quarters of 1983 show a slight slowing in the rate of economic recovery than previously forecast; as a result, manufacturing activity is now projected to rise by 9.9 percent between 1983 and 1984 and by 4.9 percent between first-half 1984 and first-half 1985. Although the assumed world oil price of $29.00 per barrel in 1984 is slightly lower than forecast previously, oil prices are still expected to remain stable at that level (in nominal terms) throughout the forecast period.

Domestic coal consumption is projected to increase by 6.4 percent between 1983 and 1984, compared with a 4.2-percent increase between 1982 and 1983. This forecast is contingent upon growth in electricity generation of 4.3 percent over the same period. If overall domestic demand for coal increases at this forecasted rate between 1983 and 1984, it is estimated that coal production will increase by 8.7 percent. This forecast was developed under the assumption that there will not be a coal strike in 1984. The forecast does, however, take into account historical production and stock alterations in anticipation of a strike.

The energy demand responses to the projected growth in economic activity are expected to reverse the 5- and 6-year downward trends in the consumption of several energy products. While this turnaround in demand is significant, the projected 1984 and first-half 1985 levels of demand for petroleum and natural gas are only beginning to approach the levels of consumption in 1981. Despite lower real petroleum prices and higher economic activity, current demand for petroleum and natural gas has shifted downward relative to 1981 levels. This development suggests that conservation, the impact of past price changes, and greater reliance on coal and nuclear power have fundamentally altered consumption patterns. Because of these changes, the response of energy demand to changes in economic variables may be different from the relationships observed historically. The energy/GNP ratio is projected to decline slightly between 1983 and 1984, continuing the historical downward trend.

Even though total U.S. petroleum demand in 1984 is projected to exceed the 1983 level, the projection for 1984 is still 2 percent below the 1981 level of 16.06 million barrels per day. Petroleum demand in the first half of 1985 is projected to be about 3 percent below the level in the first half of 1981. The 1984 forecast for total petroleum demand is below the 1981 level of demand, despite projected 1984 industrial output (the key variable driving industrial demand for petroleum) of almost 9 percent above the 1981 level, and projected world oil prices (adjusted for inflation) of more than 32 percent below 1981 average prices.

Table 1. Summary of Base Case Assumptions and Projections

	History			Projec- tions	Annual Percentage Change		
	1981	1982	1983	1984	1981-82	1982-83	1983-84
Assumptions							
Real Gross National Product (billion 1972 dollars)	1,514	1,485	1,535	1,616	-1.9	3.4	5.3
Index of Industrial Production (index, 1972=100)	150.3	137.5	148.4	163.1	-8.5	7.9	9.9
Average Cost of Imported Crude Oil (nominal dollars per barrel)	37.05	33.55	29.35	29.00	-9.4	-12.6	-1.1
Price Projections (nominal values)							
Motor Gasoline[a] (dollars per gallon)	1.35	1.28	1.22	1.22	-5.2	-4.7	0.0
Residential Heating Oil (dollars per gallon)	1.21	1.19	1.07	1.10	-1.7	-10.1	2.8
Residential Natural Gas (dollars per thousand cubic feet)	4.29	5.17	6.05	--[b]	20.5	17.0	--[b]
Residential Electricity (cents per kWh)	6.20	6.86	7.17	7.44	10.6	4.5	3.8
Consumption Projections							
Total Market Economies Petroleum Consumption (million barrels per day)	47.4	45.9	45.2	46.1	-3.2	-1.5	2.0
U.S. Total Petroleum Consumption (million barrels per day)	16.06	15.30	15.18	15.70	-4.7	-0.8	3.4
Motor Gasoline	6.59	6.54	6.62	6.70	-0.8	1.2	1.2
Distillate Fuel Oil	2.83	2.67	2.68	2.80	-5.7	0.4	4.5
Residual Fuel Oil	2.09	1.72	1.40	1.51	-17.7	-18.6	7.9
Other Petroleum[c]	4.55	4.37	4.48	4.69	-4.0	2.5	4.7
Net Petroleum Imports (million barrels per day, including SPR[d])	5.40	4.30	4.25	5.14	-20.4	-1.2	20.9
Coal Consumption[e] (million short tons)	733	707	737	784	-3.5	4.2	6.4
Natural Gas Consumption (trillion cubic feet)	19.40	18.01	16.95	17.71	-7.2	-5.9	4.5
Electricity Generation (billion kilowatt-hours)	2,294.81	2,241.21	2,308.07	2,407.22	-2.3	3.0	4.3
Total Energy Consumption (quadrillion Btu[f])	73.98	71.06	70.68	73.83	-3.9	-0.5	4.5
Thousand Btu/1972 Dollar of GNP	48.86	47.85	46.05	45.69	-2.1	-3.8	-0.8

[a]Average for all grades and services.
[b]The forecast range of natural gas prices is discussed on page 10.
[c]Includes Reclassified Petroleum Products (products rerun through the refinery process).
[d]SPR = Strategic Petroleum Reserve.
[e]Includes net imports of coal coke.
[f]The conversion from physical units to Btu is calculated by STIFS using a subset of Monthly Energy Review conversion factors. Consequently, the historical data will not precisely match that published in the Monthly Energy Review.

Note: Minor discrepancies with other published EIA historical data are due to rounding.

Sources: Historical data: Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(83/12[3]); 1982 International Energy Annual (DOE/EIA-0219(82); Organization for Economic Cooperation and Development, Quarterly Oil Statistics, Second Quarter 1983; Petroleum Economics Limited's World Quarterly Primary Energy and Supply/Demand, October 1983; Petroleum Marketing Monthly, DOE/EIA-0380(83/12[3]); Monthly Petroleum Product Price Report, DOE/EIA-0032(82/13); Petroleum Supply Monthly, DOE/EIA-0109(83/12[3]); 1982 Petroleum Supply Annual, DOE/EIA-340(83/06); Natural Gas Monthly, DOE/EIA-0130(83/12[3]); Electric Power Monthly, DOE/EIA-0026(83/12); Quarterly Coal Report, DOE/EIA-0121(83/3Q). Macroeconomic forecasts based on modifications to Data Resources, Inc., forecasts CONTROL012484.

U.S. energy needs are expected to be met by a higher level of oil imports in the short term, as domestic crude oil production in the lower 48 States is forecast to remain at about the same level between 1983 and 1984. Likewise, demand for oil imports in other major consuming countries is projected to strengthen because of increased demand and a reversal of the drawdown of petroleum inventories that occurred over the past 2 years. An important assumption underlying this forecast for oil imports is that OPEC will maintain the $29 per barrel marker crude price and increase production quotas as needed to meet demand.

Oil consumption in the market economies (a category which excludes Communist countries) is projected to increase in 1984 for the first time since 1979. However, their demand for oil is expected to be comfortably met by current production with no appreciable rise in the world oil price during 1984. The economic growth that is underway in the industrial nations is expected to continue, thus increasing demand for petroleum throughout 1984. Also, petroleum demand in the developing countries is expected to increase. The market economies' demand for petroleum is projected to increase by about 2.0 percent between 1983 and 1984 and by slightly over 2.0 percent between first-half 1984 and first-half 1985. Market economies' production of oil in the first half of 1985 is projected to be 5.6 percent above the year-earlier level.

The highlights from the base case forecast are:

- Total U.S. petroleum consumption in 1983 was 15.2 million barrels per day, slightly below the level in 1982. As the economic recovery continues into 1984, petroleum consumption is projected to rise by approximately 3.4 percent above year-earlier levels. The projection for total U.S. petroleum consumption in the first half of 1985 is for a 1.2-percent increase over the same period in 1984.

  - Motor gasoline consumption increased by 1.2 percent between 1982 and 1983, and is projected to rise by the same percentage in 1984.

  - Distillate fuel oil consumption remained relatively stable between 1982 and 1983, at 2.7 million barrels per day. A 4.5-percent increase in distillate consumption, to 2.8 million barrels per day, is projected for 1984.

  - Residual fuel oil consumption fell by 19 percent in 1983 from the 1982 level. In 1984, residual oil consumption is projected to increase by nearly 8 percent over 1983 levels.

- Net oil imports in 1983 were approximately 1.2 percent below the 1982 level. A 20.9-percent year-to-year rise in net imports, to about 5.1 million barrels per day, is projected for 1984. Net oil imports for the first half of 1985 are projected to average 5.0 million barrels per day, a 3.3-percent increase over the first-half 1984 level.

  - Total 1983 oil imports, measured on a balance-of-payments' basis, were valued at $53 billion, about 15 percent less than in 1982, primarily because of lower crude oil prices. The total cost of oil imports in 1984 is projected to rise by about 14 percent from the 1983 level.

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- Natural gas consumption in 1983 was 17.0 trillion cubic feet--about 5.9 percent lower than in 1982, and the lowest level since 1966. In 1984,. assuming economic recovery and normal weather, natural gas consumption is projected to be almost 4.5 percent above year-earlier levels. A 10.5-percent decline in gas production, to 15.9 trillion cubic feet, is estimated for 1983, with 1984 production at 17 trillion cubic feet. Natural gas production in the first half of 1985 is projected to be 3.4 percent above the first-half 1984 level.

- Domestic coal consumption is expected to rise by about 6.4 percent in 1984, to 784 million tons. Coal consumption in the first half of 1985 is forecast to increase by 5.8 percent from the first-half 1984 level. Coal exports dropped by 26.4 percent from 1982 to 1983, primarily because of the weak world economy and increased competition from Polish exports. A small recovery in exports is projected for 1984 and the first half of 1985.

  - Because of a sharp decline in coal exports, significant withdrawals from domestic inventories, and weak growth in domestic consumption, U.S. coal production is estimated to have fallen by more than 6.3 percent, to 785 million tons, in 1983. In 1984, all categories of coal consumption (including exports) are expected to increase, leading to record-high coal production of 853 million tons, almost 9 percent above the year-earlier level. The first half of 1985 is expected to reflect a similar rise in coal production (10 percent) over the first-half 1984 level.

- Total electric power generation increased 3.0 percent from 1982 to 1983, to 2,309 billion kilowatt-hours. As a result of the projected healthy growth in the economy, especially in the industrial sector, a 4.3-percent year-to-year rise in electricity generation is projected for 1984. Electric power generation between first-half 1984 and first-half 1985 is expected to increase by 2.9 percent.

  - Generation from coal, nuclear power, and hydroelectric power increased from 1982 to 1983, while petroleum- and natural gas-fired generation declined. Electric utility use of all energy sources (with the exception of hydroelectric power) is projected to increase from 1983 to 1984.

  - Hydroelectric generation, which averaged about 283 billion kilowatt-hours per year since 1973, was 332 billion kilowatt-hours in 1983, a record of 17 percent above the average level. The 1984 projection reflects a continuation of higher than normal levels of hydroelectric generation due to the current high water availability.

- Total U.S. energy consumption (as measured by gross energy consumption) was 70.7 quadrillion Btu in 1983, and is projected to rise by 4.5 percent, to 73.8 quadrillion Btu, in 1984 (see Table 1). Total U.S. energy consumption is expected to increase by nearly 2 percent between first-half 1984 and first-half 1985.

  - The share of total energy consumption accounted for by petroleum is projected to remain at approximately 42 percent during 1983 and 1984, while the coal share is forecast to remain at 23 percent in 1984. The natural gas share is forecast to be about 25 percent of total energy consumption throughout the forecast period.

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- The energy intensity of U.S. economic activity declined to 46.1 thousand Btu per 1972 dollar of GNP in 1983. With U.S. energy use projected to rise somewhat less rapidly than GNP from 1983 to 1984, a further slight decline in the energy/GNP ratio is expected.

It should be noted that the forecast previously discussed is this Outlook's base case forecast. Additional sensitivity case are published for petroleum supply and disposition, based on the combined effects of alternative economic growth rates and oil prices. Should the imported crude oil prices and economic growth that occur during the forecast period differ from the base case assumptions, it is estimated that:

- For each 1-percent increase in GNP above the forecast levels, petroleum consumption and total imports in 1984 would increase by 220,000 barrels per day (approximately 1.4 percent and 3.7 percent, respectively).

- For each $1-per-barrel (approximately 3.4 percent) decline in the price of imported crude oil, petroleum consumption and total imports in 1984 would increase by 80,000 barrels per day (approximately 0.5 percent and 1.4 percent, respectively).

- For each 10-percent increase in heating degree days during the first and fourth quarters, petroleum consumption and total imports would increase by an average of 190,000 barrels per day (approximately 1.2 percent and 3.3 percent, respectively).

- For each 15-percent increase in cooling degree days during the second and third quarters, petroleum consumption and total imports would increase (because of higher electric utility demand for residual fuel oil) by an average of 30,000 barrels per day (approximately 0.2 percent and 0.5 percent, respectively).

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# 2. The Outlook

Forecast Assumptions

World Oil Prices

The price of imported crude oil delivered to U.S. refineries is assumed to stabilize in the neighborhood of $29 per barrel in the base case projections. Several factors have been responsible for downward pressure on crude oil prices during the last 2 years: declining energy demand in a generally depressed world economy; inventory drawdowns and resulting lower imports in major consuming countries; and additional oil production, particularly by countries that are not members of the Organization of Petroleum Exporting Countries (OPEC).

In the base case, the price of crude oil is assumed to be level (in nominal terms) through 1984 and the first half of 1985 because:

- World economic growth that resumed in 1983 is projected to remain strong in 1984, with the result that oil demand will increase from recent levels. The higher demand for oil is expected to maintain prices that are currently facing downward pressure because of excess supply.

- The apparent large drawdowns of petroleum inventories in the importing countries during the last 2 years are projected to end during 1983, contributing to the increased demand for oil in the world market.

- Recent attempts to restrain OPEC crude oil production are assumed to succeed to the extent that they prevent a major surge of additional production and a resulting price war. It is, however, expected that crude oil production will be raised sufficiently to meet projected demand.

The three alternative forecast cases presented in this Outlook incorporate differing economic growth and price assumptions in order to provide a significant range of energy consumption projections. The petroleum price assumptions associated with these cases are as follows (see Figure 1):

High Economic Growth: As a result of lower levels of petroleum demand and/or higher levels of production than expected in the base case, the average price of crude oil to U.S. refiners is assumed to fall to $25 per barrel in the second quarter of 1984, and then to remain at that level for the remainder of the forecast period.

Base Case: Prices are assumed to remain at $29 per barrel throughout 1984 and the first half of 1985.

Low Economic Growth: As a result of increased tension and concerns about the availability of future supply in the oil market, prices are assumed to rise at more than twice the U.S. rate of inflation and to average nearly $33 per barrel by the second quarter of 1985.

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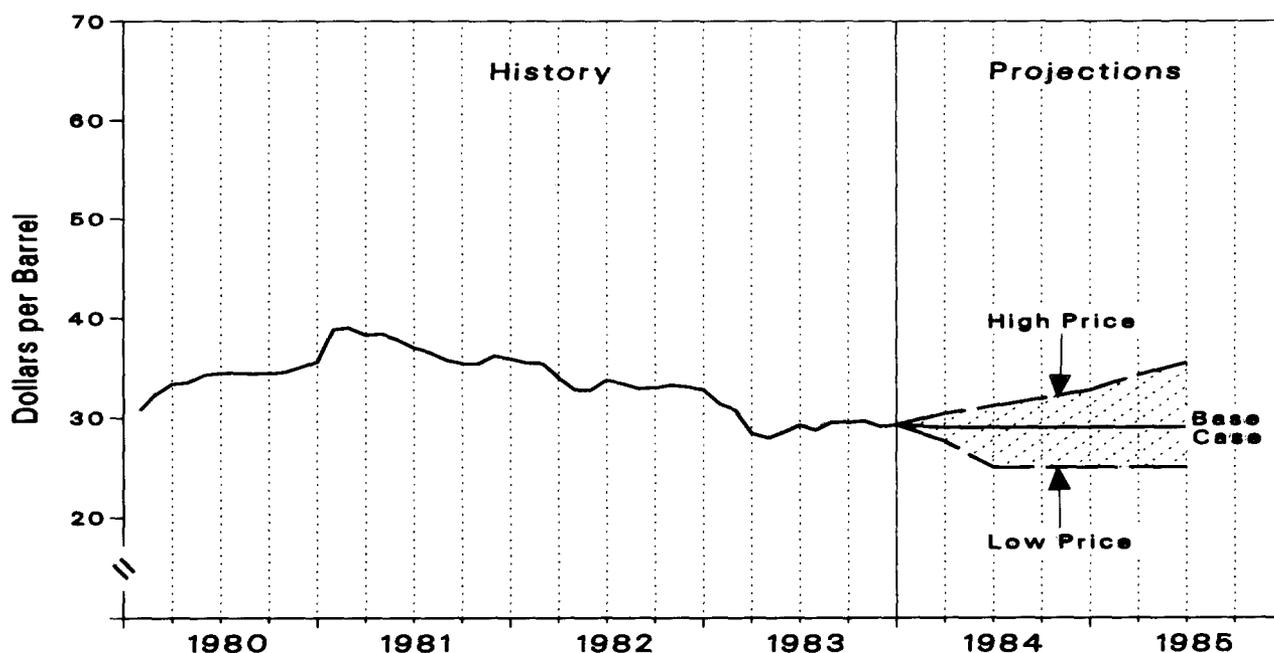
Figure 1. Imported Crude Oil Prices

The assumptions used to generate the high and low projections are designed to produce the widest probable variation in demand, given the current range of forecasts for these variables. For example, the high growth case uses the low assumed world oil price. This scenario does not imply that high economic growth will result in a lower oil price nor is this case necessarily inconsistent. Rather, this case is designed to show the effects on petroleum demand of the extreme ranges of these variables.

Macroeconomic Activity

The economic recovery that began in the first quarter of 1983 is projected to continue through the forecast period. Real Gross National Product (GNP) is projected to grow by 5.3 percent from 1983 to 1984, and then slow to 3.6 percent between first-half 1984 and first-half 1985. This projection is based on the Data Resources, Incorporated, (DRI) CONTROL012484 forecast of January 1984, modified to reflect the projected base case price of world oil.

Real Disposable Personal Income (RDPI) is projected to increase less rapidly than real GNP, growing at a projected rate of 4.6 percent from 1983 to 1984. Manufacturing activity, which rose by 7.9 percent from 1982 to 1983, is forecast to increase by 9.9 percent from 1983 to 1984. Inflation, as measured by the GNP implicit price deflator, is projected to continue recent trends; the deflator increased 4.2 percent from 1982 to 1983 and is projected to rise by 4.3 percent in 1984. (Assumptions pertaining to price, the economy, and weather are shown in Table 2.)

Continued recovery through the first half of 1985 is based on the assumptions of stable interest rates, no increase in inflationary pressures, and continued growth

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in key sectors such as housing, automobiles, and capital goods. (These data are from the DRI's U.S. Model data bank.) In 1984, housing starts are assumed to average 1.8 million units. New car sales are projected to exceed 10 million units (at an annual rate) every quarter after the second quarter of 1984. Investment in producers' durable equipment is expected to reach $133 billion (1972 dollars) in 1984, or more than 12 percent higher than its 1983 level, and nonresidential construction is projected to reverse its decline of 6.7 percent in 1983, climbing 5.8 percent between 1983 and 1984. Combined, these factors lead to a forecast 10.6-percent rise in total fixed business investment, to almost $186 billion (1972 dollars). This level would be an all-time high for business fixed investment, surpassing the previous peak ($174 billion) in 1981. Manufacturing production also is expected to reach a record high, surpassing the previous peak in 1979.

Alternative forecast cases are designated as high and low economic growth. These macroeconomic projections (as modified by the oil price paths) provide a range of possible paths for energy consumption above and below the base case forecast. The high economic growth case is based on the DRI forecast OPTIM012684, and projects that real GNP will grow by 5.9 percent from 1983 to 1984 and by 4.9 percent from first-half 1984 to first-half 1985. The low economic growth case is based on DRI's BAD84012684 forecast. In this case, real GNP grows at 4.5 percent between 1983 and 1984 and 1.6 percent between first-half 1984 and first-half 1985.

Energy Product Prices

Petroleum product prices in nominal terms (meaning unadjusted for inflation) are generally expected to remain stable throughout the forecast period, in line with the assumption of constant world oil prices. (See Figure 2 and Table 3.) Product price fluctuations, which are usually small under normal circumstances, result mainly from seasonal variations in demand.

The retail price of motor gasoline fell by nearly 5 percent from 1982 to 1983, as a result of the decrease in the world oil price and adequate supplies. The nominal price of motor gasoline is expected to remain stable through 1984, then rise slightly (1 or 2 cents) in the first half of 1985, as retailers are projected to increase their margins at approximately the rate of inflation.

In 1983, the retail price of heating oil fell by 10 percent from 1982 levels, mainly as a result of the mild winter weather in the first quarter of 1983. The unusually cold weather that occurred the last 2 weeks of 1983 and continued into January of 1984 has drained inventories considerably and is expected to raise average heating oil prices in the first quarter above the normally expected seasonal increase. Returning to the normal seasonal pattern, the nominal price of heating oil is projected to decline in the second and third quarters of 1984. Assuming normal weather throughout the remainder of the forecast period, the retail price of heating oil is expected to rise by about 2.8 percent from 1983 to 1984 as margins are assumed to increase with the rate of inflation.

The retail price of residual fuel is expected to increase by about 3 percent in nominal terms (and decline slightly in real terms) in 1984, as a result of forecasted stability in crude oil prices. In the first half of 1985, little change is expected in the price of residual fuel oil. The nominal price of kerosene-based jet fuel is projected to remain stable throughout the forecast period.

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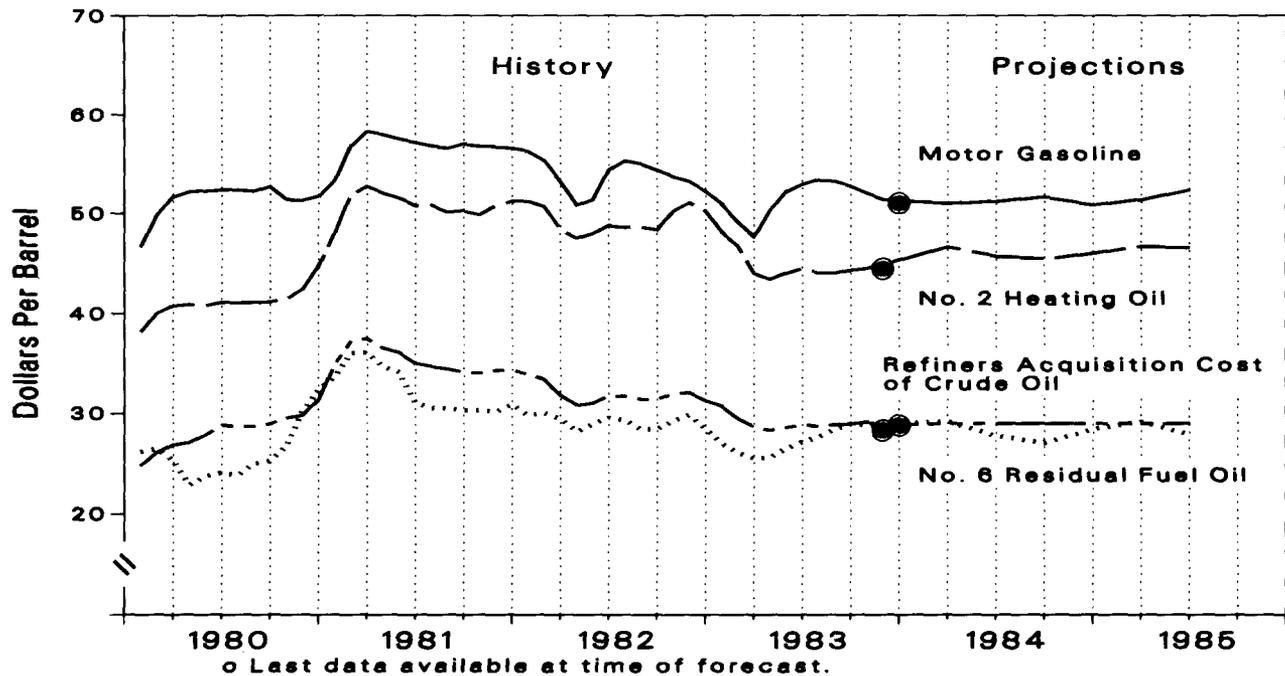
Figure 2. Retail Prices For Petroleum Products

A new series for the residential price of natural gas, developed by EIA, is reflected in this Outlook. The previous natural gas price series, published by the Bureau of Labor Statistics, is based on surveys of the first 100 therms (1 therm = 100,000 Btu) sales of natural gas in major urban areas. The EIA series is based on the average price of all residential sales of natural gas and provides a more representative picture of residential natural gas prices. Because of the uncertainty regarding natural gas prices, this Outlook includes a range of price forecasts for natural gas, as discussed in the Natural Gas Decontrol box.

The residential price of electricity, which increased by 4.5 percent between 1982 and 1983, is expected to increase at the rate of inflation throughout the forecast period, because the costs of fossil fuels purchased by electric utilities are expected to increase only slightly. In addition, average capital costs are expected to be lower in 1984 than in 1983.

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Natural Gas Decontrol in 1985

The forecasting of natural gas prices has become more difficult because of the uncertainties of market reactions to wellhead price decontrol in 1985. Available evidence and speculation about future events can lead to widely different conclusions: even the direction of the price change after decontrol is unclear. Arguments exist in favor of either an increase or a decrease in the price of natural gas. Between January and October of 1983, the wellhead price of natural gas remained essentially unchanged after increasing for the last 10 years. Recent data indicate that the moderation in wellhead price increases may continue. On January 1, 1985, however, over 50 percent of the natural gas currently produced will be exempt from Federal price controls under the terms of the Natural Gas Policy Act (NGPA) of 1978. Such a decontrol measure could result in an increase in the real price of natural gas as a result of price escalation clauses in existing contracts triggered by the removal of price ceilings.

The evidence supporting the forecast of higher gas prices in 1985 includes:

- The expiration of intrastate gas contracts in 1984 and 1985 could lead to higher prices by replacement of relatively inexpensive natural gas with higher cost gas.

- The average price of natural gas under new contracts currently equals or exceeds the average wellhead price. As old natural gas is depleted, increased use of higher cost, new natural gas will result in a higher average price over time.

- Many contracts contain indefinite price escalator clauses, which are tied to oil prices or the highest prices currently paid by others, and have no market-out provisions. After decontrol, prices under these contracts may increase to an oil-price equivalent, a level that is currently higher than the average natural gas price.

- The market-out clauses that were invoked in 1983 may have been exhausted. If so, options for pipelines to hold down price increases are more limited.

On the other hand, significant market pressures that could force natural gas prices to stay constant or even decline include:

- Natural gas is now priced more competitively with heating oil and fuel oil for many of its traditional markets.

- Purchases of old, inexpensive natural gas, which is currently shut in because of low demand, may increase.

- Producers may continue to renegotiate contracts, in an attempt to maintain or increase their market share in a period of relatively weak demand and low-priced competing fuels.

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- Significant excess deliverability currently exists for domestic natural gas production.

These uncertainties make the estimation of natural gas prices extremely difficult; therefore, in this case, the entire range of forecasted prices should be considered equally likely. The low price forecast assumes no increase in the wellhead price[1] between 1983 and 1984, and only a slight increase during the first half of 1985. The high price case assumes a resumption of the upward trend in wellhead prices, with increases of about half the 1982-1983 rate through the middle of 1985. The residential margins (the difference between the wellhead price and the end-use price) are assumed to increase at the same rate as the wellhead price. Utility margins are assumed to remain fixed in nominal terms over the forecast period, because of the direct competition between natural gas and residual fuel oil in the utility market.

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[1]This price series is published in the Natural Gas Monthly, DOE/EIA-0130 (83/12).

International Petroleum Situation

The fourth consecutive year of declining world oil consumption occurred in 1983. (See Table 4.) However, a turnaround in oil demand appears to have occurred during the second half of 1983 as economic growth and the continued decline in real oil prices increased the demand for petroleum in the industrial countries. Petroleum supply, the sum of production in the market economies and net exports from the Communist countries, is projected to have totaled 44.6 million barrels per day during 1983, down by 0.1 million barrels per day from the 1982 level. World oil inventories are estimated to have been reduced further during 1983 to 4.7 billion barrels, a decline of approximately 200 million barrels since the end of 1982.

The projected reversal in the trend of declining petroleum demand is partially based on assumed overall increase of Gross Domestic Product (GDP) in the Organization for Economic Cooperation and Development (OECD) countries of 2.1 percent in 1983, 3.6 percent in 1984, and 2.9 percent between the first half of 1984 and the first half of 1985. (See Table 5.) The estimates for the fourth quarter of 1983 are based on actual data for the United States and on a mixture of projected and preliminary data for major producing and consuming countries.

During 1984, the projected acceleration in world economic growth, the expected decline in real world oil prices, and the assumed normal weather pattern in the Northern Hemisphere are projected to increase total petroleum demand in the market economies by an average of 0.9 million barrels per day between 1983 and 1984, with about one half of the increase projected to occur in the United States. Combined with this expected increase in petroleum demand is a projected end of the large draws on world petroleum stocks that occurred in 1983 (see

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Figure 3), creating a required increase in world oil supply of 1.6 million barrels per day between 1983 and 1984. Of this increase, OPEC's share is expected to be 1.0 million barrels per day.
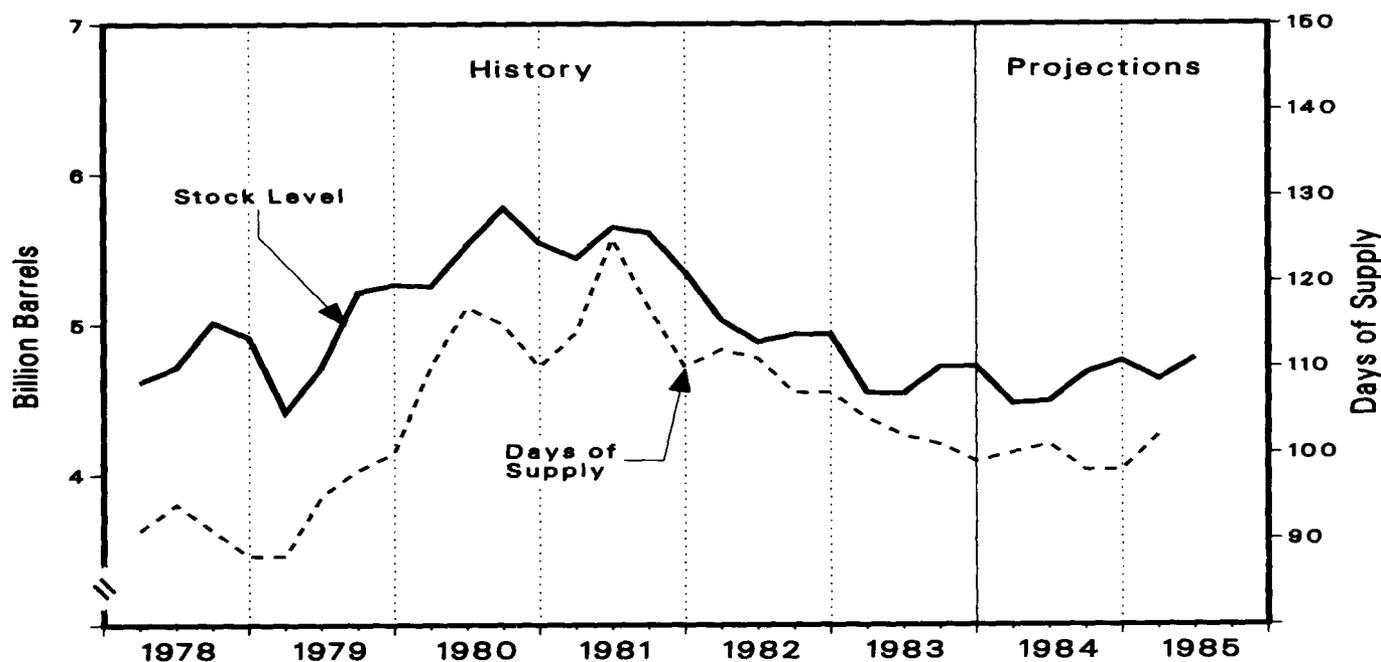
Figure 3. Market Economies Oil Stocks

Table 5. International Economic Growth
(Percent Change from Previous Period)

Region	Annual Average 1970-1982	1983[a]	1984[a]	First-Half 1985[a]
OECD Total[b]	2.8	2.1	3.6	2.9
United States[c]	2.7	3.3	5.3	3.6
Western Europe	2.6	0.9	1.7	2.1
Japan[c]	4.5	3.4	4.2	2.8
Other OECD[d]	3.1	0.8	4.5	3.3

[a]Preliminary estimates for Organization for Economic Cooperation and Development (OECD) countries.
[b]Gross Domestic Product.
[c]Gross National Product.
[d]Canada, Australia, and New Zealand.
Sources: Historical data: Organization for Economic Cooperation and Development, Main Economic Indicators, October 1983. Forecasts: Wharton Econometric Forecasting Associates, World Economic Outlook, December 1983. Data Resources, Inc.: Canada's Forecast, CONTROL121483; European Forecast, CONTROL011284; and Japan's Forecast, JPCONTROL0184.

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The projected slowdown in economic growth expected in the first half of 1985 will relieve some of the pressure on petroleum demand. However, the continued fall in the real world oil price, in addition to the expected depreciation in the effective dollar exchange rate, will tend to bolster demand in the second half of 1984 and into 1985.

Table 4 summarizes the international petroleum outlook for 1984 through the first half of 1985. The major uncertainties underlying the base case outlook for level nominal prices are OPEC's pricing and production policies, and the uncertainty regarding the rate of economic growth and the extent to which any recovery is translated into an increase in oil demand. In the base case projection, OPEC's average crude oil production in 1984 would exceed its 1983 production quota of 17.5 million barrels per day by 2.0 million barrels per day. The base case assumes that OPEC will resolve the differences among its members with respect to production quotas and prices by maintaining the $29 per barrel marker crude price and by increasing the production quotas as needed to meet demand. However, as of this writing, it is not clear that OPEC would necessarily respond to an increase in demand in this manner. Consequently, the possibility of a price increase remains, if OPEC holds to its production quota. Alternatively, if OPEC's current discipline on restraining production is not maintained, overproduction by OPEC could lead to a decrease in oil prices.

Another major uncertainty is the possibility of weaker demand for oil, especially in Europe. This could occur if the dollar remains strong against the major currencies, if economic growth is not as strong as projected, or if the substitution of other fuels for oil continues at roughly the same rate as experienced in Europe during 1983. In any of these instances, there would be a weakening of demand which could lead to downward pressure on world oil prices and further uncertainty about OPEC's policies.

During 1982 and 1983, the decline in the market economies' oil consumption has been accompanied by substantial drawdowns of their oil inventories. These drawdowns appear to have ended in the second half of 1983 (see Figure 3). The projected inventory level of 4.7 billion barrels at the end of 1983 is equivalent to an estimated 101 days of projected oil consumption, which is significantly greater than the estimated 85 days of forward consumption that existed at the outbreak of the Iranian revolution at the end of 1978. Moreover, the current surplus in sustainable oil production capacity and low refinery utilization rates in the market economies should ensure that international oil stocks will be sufficient to meet consumption needs without putting undue pressure on demand during 1984 and 1985. From 1983 through the first half of 1985, world commercial oil stocks in the market economies are projected to remain roughly level on a seasonally adjusted basis, with the United States expected to continue filling the Strategic Petroleum Reserve.

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U.S. Petroleum Outlook

Overview

Total petroleum demand declined in 1983 for the 5th consecutive year. However, decline was entirely due to the decrease in the demand for residual fuel oil: The demand for motor gasoline, distillate fuel oil, and other petroleum products increased between 1982 and 1983. The 5-year downward trend in total petroleum demand is expected to reverse in 1984, as petroleum consumption is projected to increase by 3.4 percent, to 15.7 million barrels per day. (The base case forecast is presented in Table 6; alternative cases for high and low economic growth are shown in Tables 7 and 8, respectively.) All petroleum products except motor gasoline are expected to show substantial increases from 1983 to 1984, based on the assumption of normal weather and the projected increases in industrial production. Motor gasoline demand is projected to increase only slightly, as higher average fuel efficiency partially offsets the effects of an improving economy.

Petroleum demand during the first half of 1985 is expected to be about 1.2 percent above the level during the first half of 1984. Increases in the consumption of distillate fuel oil and "other" petroleum products are almost completely offset by a decline in motor gasoline demand, mostly as a result of the continued improvement projected for the fuel efficiency of the automobile fleet.

Primary petroleum stocks are projected to be built to about 1.11 billion barrels by the end of 1984, slightly above closing stocks in 1983. The substantial drawdown in primary petroleum stocks during the first quarter of 1983 is not expected to be repeated during the first quarter of 1984. The slight buildup in petroleum stocks is projected in 1984 from the unusually low levels at the end of 1983 because of the colder-than-normal weather in the fourth quarter of 1983.

Net petroleum imports, including those for the Strategic Petroleum Reserve (SPR), are projected to average 5.1 million barrels per day in 1984, up 21 percent from the 1983 level.

Domestic Petroleum Production

Domestic crude oil production was 8.66 million barrels per day in 1983, essentially unchanged from the 1982 level, and is projected to remain at about that level in 1984. (See Table 6.) Alaskan North Slope production is expected to show a slight increase (0.6 percent) from 1983 to 1984, and then a 5.4 percent increase between first-half 1984 and first-half 1985 as new production from the Kuparuk field comes online. This additional production from Alaska will partially offset the expected decline in Lower-48 States' production. Lower-48 States' production is projected to be essentially unchanged from 1983 to 1984, and a 1.6-percent decrease is expected for the first half of 1985 compared to the same period in 1984. Much of the expected slowdown in the decline of petroleum production in the Lower-48 States during 1984 is attributed to higher production from reserves in older producing areas, rather than to the discovery of significant new reserves.

Exploration and drilling activity has continued to show strength and is expected to increase through the forecast period. Declines in the cost of drilling and the stabilization of the forecast for oil prices should lead to a rise in drilling

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activity. The average number of rotary rigs in operation during the final 2 months of 1983 was slightly above year-earlier levels. This increase is a significant change from the experience during the first three quarters of 1983, which showed a 36-percent drop from year-earlier levels. The average number of crews engaged in seismic exploration has remained relatively flat since the third quarter of 1983 and is expected to increase during the forecast period.

Petroleum Inventories

In terms of both total inventories and days' supply, petroleum stocks are projected to be lower than during the period of unusually high inventories following the major increase in petroleum prices in 1979 and 1980. (See Table 10 and Figure 4.) End-of-year primary stocks, excluding stocks held in the Strategic Petroleum Reserve (SPR), were 67.5 days' supply in 1983 and are projected to be 68.4 days' supply in 1984 (at the next quarters' anticipated rates of product supplied). This forecast represents a substantial decline from the nearly 79 days' supply at the end of 1981, but is about the same as the 68 days' supply level reached in 1979. SPR stocks, which were just above 90 million barrels by the end of 1979, are currently forecast to exceed 440 million barrels by the end of 1984 and over 465 million barrels by mid-1985. SPR crude oil inventories surpassed primary crude inventories in September of 1983 and are now over half the planned final level of 750 million barrels.
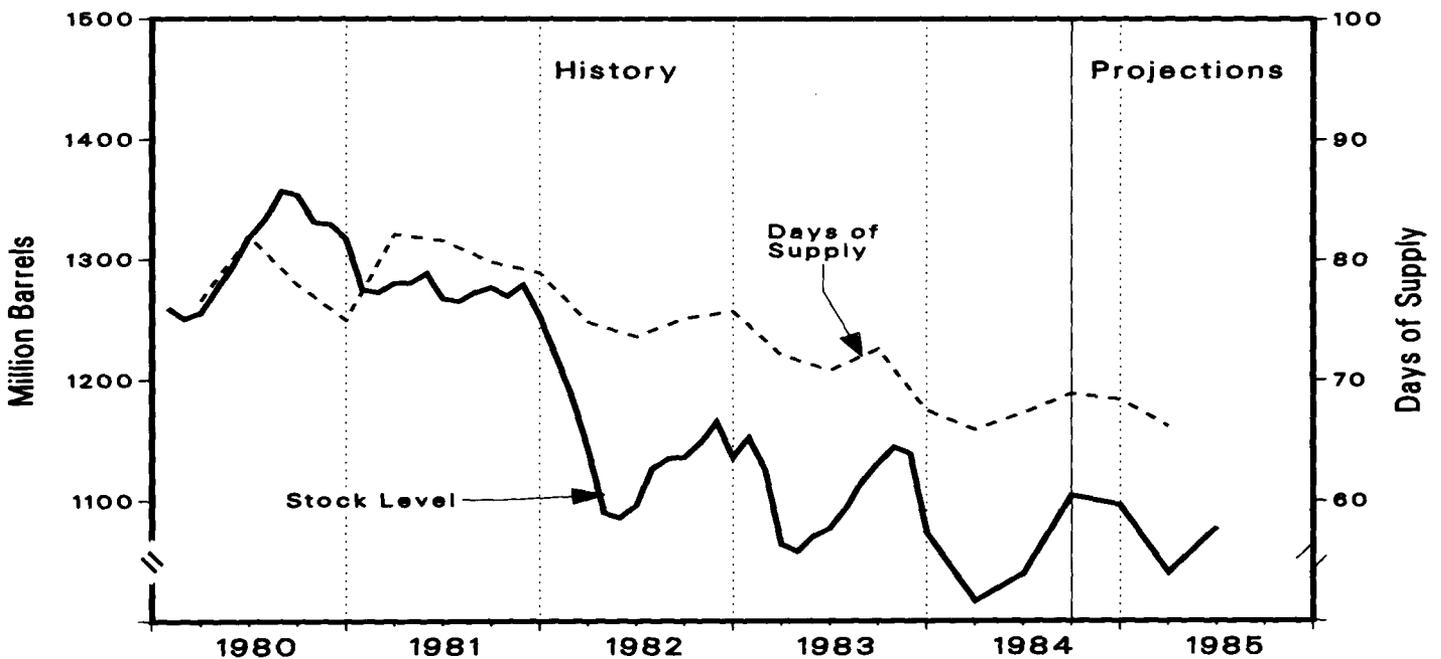
Figure 4. Total Petroleum Inventories Excluding SPR

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Petroleum stocks experienced substantial drawdowns during December of 1983 because of the below-normal temperatures. As a result of the high demand for heating oil, distillate fuel oil stocks at the end of the first quarter of 1984 are projected to be 104 million barrels, a level near the minimum operating inventory level of 105 million barrels estimated by the National Petroleum Council. Seasonal swings in total petroleum inventories are expected to continue to be dominated by product stocks, while crude oil inventories are projected to remain stable. The projection of crude oil fill rates for the SPR in 1984 and first-half 1985 is based on a forecast of deliveries provided by the SPR program office.

Declines in stocks of major petroleum products during 1983 (calculated using opening 1983 stocks rather than closing 1982 stocks, which differ because of an expanded respondent universe) were: finished motor gasoline, 8.4 percent; distillate fuel oil, 24.3 percent; and residual fuel oil, 27.0 percent. In terms of days' supply, finished motor gasoline was down 10.7 percent, distillate fuel oil was down 32.3 percent, and residual fuel oil was down 35.1 percent.

Petroleum Imports

Net U.S. imports of petroleum in 1983 were nearly 4.3 million barrels per day, essentially the same level as in 1982. As shown in Table 6, net petroleum imports in the fourth quarter of 1983 were 50 percent above the very low level of 3 million barrels per day reached in the first quarter of 1983. Net petroleum imports in 1984 are projected to be up 21 percent from the 1983 level, averaging 5.1 million barrels per day. (Net imports in 1983 were at the lowest level since 1971.) In the first half of 1985, net imports are projected to average 5 million barrels per day, up about 3 percent from year-earlier levels.

Total 1984 oil imports, measured on a balance-of-payments basis, are projected to cost about $62 billion in nominal terms (14 percent higher than in 1983), as a result of higher imports and slightly lower prices for crude oil. Imports in the first half of 1985 are projected to cost approximately $30 billion, slightly more than a year earlier, reflecting a small rise in the level of imports. (The total cost of oil imports on a balance-of-payments basis is the cost of oil delivered alongside ship at the exporting country, excluding the cost of transportation to the United States. The cost of total imports includes the cost of both crude oil and products delivered to the 50 States and U.S. territories, including imports for the SPR.)

Petroleum Demand Sensitivities

Table 9 and Figure 5 show the response of petroleum demand to changes in price, income, and weather. The sensitivity cases were developed as follows:

- The low and high price demands are based on the price paths shown in Table 3, holding the variables representing economic activity at their base case levels.

- The economic sensitivity cases are derived from the low and high growth economic assumptions given in Table 2, holding prices at their base case trajectories.

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- The weather sensitivity cases are based on variations in population-weighted heating degree days and cooling degree days of 10 percent in the first and fourth quarters, and 15 percent in the second and third quarters, respectively.
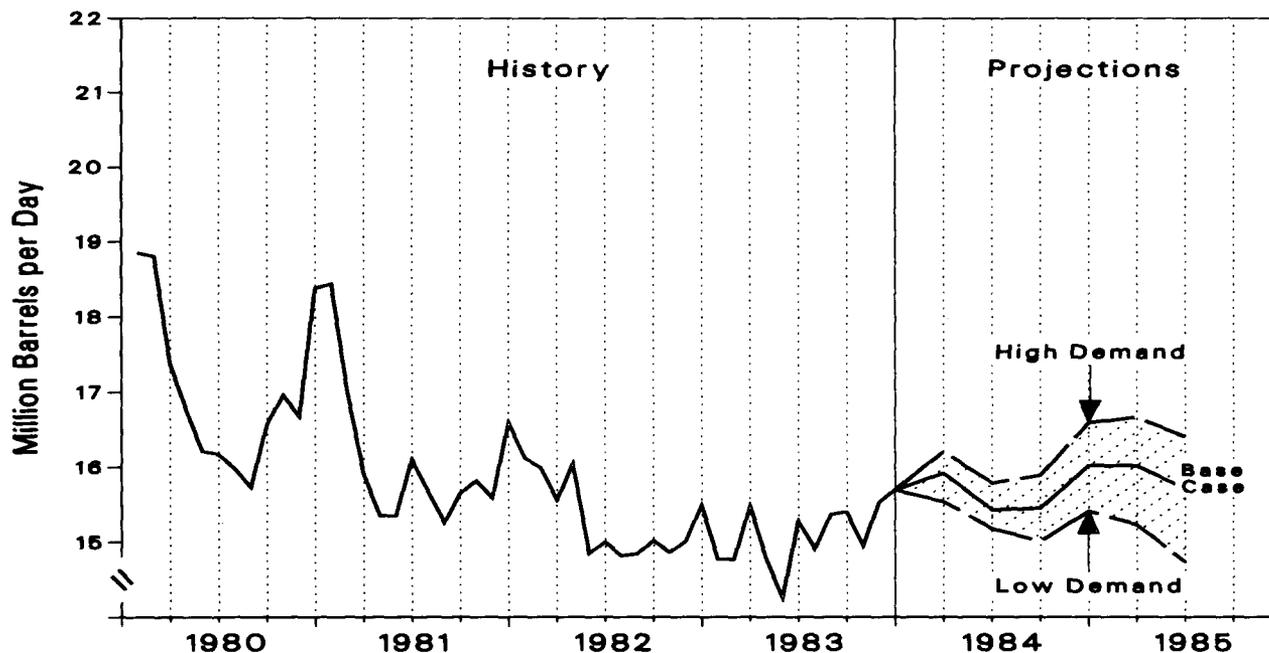
Figure 5. Total Petroleum Demand

In 1984, the variation in petroleum demand due to price is the largest of the sensitivity cases analyzed, with a range of almost 450,000 barrels per day between the low price and high price cases for the year. Weather sensitivity differentials are highest in the first and fourth quarters of the year, as variations in demand due to heating requirements affect petroleum consumption to a greater degree than do variations in cooling requirements in the summer. Variations in economic activity also have a significant impact on petroleum demand, particularly during the first half of 1985, with differences from the base case as large as 500,000 barrels per day in the second quarter of 1985.

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Impact of Cold Winter Weather on Energy Consumption

Total energy use historically has exhibited a sharp peak during the winter heating season. So far this winter, the seasonal increase in energy demand has been larger than normal because of the unusually cold weather during December and January. A few very cold weeks in those months resulted in population-weighted heating degree days for the Nation 19.4 percent above normal in December and 6.2 percent above normal in January, for a December/January total of 12.4 percent above normal. (In contrast, weather in February for the Nation was much warmer than normal, somewhat moderating the seasonal swing in demand.) Despite the very unusual monthly variations in heating degree days for the 1983-1984 heating season, the national average population-weighted heating degree days for November through February were at normal levels.

The impact of cold weather on energy demand is highest for natural gas, distillate fuel oil, and electricity, the major sources of energy used for residential heating. (In 1983, over 90 percent of homes were heated with one of these fuels.) As a result of the unusually cold weather in December and January, natural gas demand is estimated to have been 0.16 trillion cubic feet above the level expected with normal temperatures; distillate fuel oil demand for those 2 months is estimated to have been up by 0.2 million barrels per day; and electricity demand is estimated to have been 7.5 billion kilowatt-hours above the level expected with normal heating degree days. The weather-related effect on the demand for nonutility residual fuel oil is estimated to have been 0.045 million barrels per day.

The comparison with last winter is even more dramatic. Heating degree days during December and January of the current heating season were 26.4 percent above the level during the 1982-83 winter, leading to a correspondingly greater demand for energy during this period (more than twice the impact compared to normal heating requirements). In addition, a much stronger economy (fourth- quarter industrial production was 17 percent above year-earlier levels, for example) also has resulted in increased energy consumption. The weather impact combined with the economic recovery lead to the stronger demand for energy experienced so far this winter compared with year-earlier levels.

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Motor Gasoline

The summer quarter of 1983 apparently marked a turning point in domestic motor gasoline consumption, as continued moderation in gasoline prices and an expanding economy reversed the 4-year decline in consumption that began in the second quarter of 1979. While Table 11 indicates that the year 1983 brought a 1.2-percent increase in motor gasoline consumption (product supplied) compared to 1982, the second half of 1983 was about 3 percent above year-earlier levels. Average motor gasoline consumption is expected to continue increasing at a moderate pace of about 1.2 percent between 1983 and 1984, to 6.7 million barrels per day.

The forecasted increase in motor gasoline consumption between 1983 and 1984 is based on the expectation that increases in automobile efficiency will be outweighed by the effects on travel demand of a projected 4.6-percent growth in real disposable personal income, 9.9-percent growth in industrial production, and 4.5-percent decline in the real price of gasoline. In the first half of 1985, motor gasoline consumption is expected to be about 2.6 percent below the comparable 1984 level.

The forecast return to lower gasoline consumption in the first half of 1985 is based primarily on the expectation of slower rates of growth in income and industrial production compared with year-earlier levels (resulting in lower growth rates in vehicle-miles traveled), combined with the strong advance expected for average automobile efficiency. During the first half of 1985, new car sales are projected to be about 6 percent above year-earlier levels, with an expected increase in average new car efficiency of 4 percent over this period. In addition, real gasoline prices are expected to decline at a slower rate in 1985 than in 1984, further slowing the tendency toward increased gasoline consumption.

Distillate Fuel Oil

Continued economic recovery, stable or falling real prices of distillate fuel oil, and assumed normal weather are projected to cause a significant increase in distillate demand in 1984 for the first time in 6 years. (See Table 12.) Consumption in 1984 is expected to average 2.80 million barrels per day, over 4 percent above 1983 levels. The primary cause of the increase is economic activity, particularly industrial production, which is projected to rise by almost 10 percent in 1984 (after a healthy 8-percent increase in 1983). The real price of distillate fuel oil is expected to remain about constant between 1983 and 1984. Population-weighted heating degree days are assumed to be slightly above normal during 1984, at about the same level as in 1983: the abnormally cold weather in the second and fourth quarters of 1983 offset the abnormally warm first-quarter weather, resulting in total heating degree days slightly above normal for 1983.

Most of the projected increase in distillate demand in 1984 is projected to occur during the first half of the year, again primarily due to the strong year-to-year increase in economic activity. Virtually all of the 1984 increase is projected to result from heating and industrial uses of distillate fuel. Demand for heating oil in the residential, commercial, and industrial sectors is projected to increase by about 120,000 barrels per day in 1984. Diesel fuel, while continuing to be approximately half of total distillate demand, is not expected to change significantly, mainly because of its historically smaller responsiveness to changes in

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industrial activity. The narrowing difference between gasoline and diesel prices, together with plentiful supplies of gasoline, appears to have significantly slowed the "dieselization" of the private automobile fleet, at least in the short term.

During the first half of 1985, continued economic growth is expected to sustain the growth in distillate demand, but at a lower rate than was experienced between 1983 and 1984. Demand in the first half of 1985 is projected to average 3.04 million barrels per day, 3.8 percent above year-earlier levels. This growth is less than half the rate projected between the first half of 1983 and the first half of 1984. Industrial production during the first half of 1985 is assumed to be 4.9 percent above year-earlier levels, much less than the growth rate of 13.6 percent assumed between first-half 1983 and first-half 1984.

Residual Fuel Oil

Residual fuel oil consumption, which averaged 1.72 million barrels per day in 1982, dropped to 1.40 million barrels per day in 1983, a decrease of 19 percent. (See Table 13.) Much of this annual decline can be attributed to the slow economic activity and lower levels of electricity generation (which accounts for about 39 percent of total demand for residual fuel oil demand on a yearly basis) in the first quarter of 1983.

Total demand for residual fuel in 1984 is expected to increase by 7.9 percent from the 1983 level. Nonutility demand for residual fuel oil, which was 61 percent of total demand in 1983, is projected to increase slightly (beginning in the fourth quarter of 1983) by 2.4 percent from 1983 to 1984, lagging the current economic recovery. Utility use of residual fuel over this period, which is projected to account for most of the increase in residual fuel demand, is forecast to grow by 14.3 percent from 1983 to 1984. In the first half of 1985, demand for residual fuel oil is projected to increase by 5.6 percent over year-earlier levels. The main reasons for the projected increase in residual fuel oil demand in 1985 are continued economic growth and the outlook for a more competitive price of residual fuel oil relative to the price of natural gas (resulting in less fuel switching to natural gas).

The Demand for Residual Fuel Oil in 1983

In many respects, 1983 represented a turnaround in the demand for petroleum products: Demand for motor gasoline, distillate fuel, and other petroleum products all increased in 1983 for the first time in 4 years. These turnarounds were largely the result of the economic recovery. Between the fourth quarters of 1982 and 1983, real Gross National Product increased 6.1 percent, real disposable personal income increased 5.1 percent, and the index of industrial production increased 16.8 percent. However, the demand for residual fuel between 1982 and 1983 decreased by 19 percent, continuing a declining trend that started in 1977.

This decrease in the demand for residual fuel is puzzling in light of the available causal data. The data presented below show the quarterly percent changes from year-earlier levels in residual fuel consumption, the Federal Reserve Board index of industrial production for manufacturing industries, petroleum used in electricity generation, and total electricity generation.

Percent Change from Year-Earlier Levels

| | 1983 | | | | |
	1Q	2Q	3Q	4Q	Year
Total Residual Fuel Demand	-27	-20	-13	-12	-19
Index of Industrial Production	-1	+5	+11	+17	+8
Petroleum Used in Electricity Generation	-24	-4	+15	+16	-2
Total Electricity Generation	-5	0	+8	+9	+3

These data show that while the economy experienced a recovery starting in the second quarter of 1983, residual fuel oil demand continued to decline. This trend was most evident in the fourth quarter of 1983 when the index of industrial production increased by about 17 percent over year-earlier levels, but residual fuel demand actually decreased by 12 percent.

Examining total petroleum use by electric utilities (nearly all of which is residual fuel) shows a somewhat similar pattern. In the first quarter of 1983, petroleum use by electric utilities decreased by almost as much as total residual fuel use (in percentage terms), partly as a result of the decrease in total electricity generation. However, by the third quarter of 1983, petroleum use by electric utilities increased by 15 percent over year-earlier levels, in conjunction with an 8-percent increase in total generation, while total residual oil demand fell by 13 percent. It is also important to note that natural gas prices to electric utilities between 1982 and 1983 increased slightly while residual fuel prices decreased slightly, suggesting that an incentive existed for some utilities to switch from natural gas to residual fuel.

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Data are not yet available on changes in the components of nonutility residual fuel uses, namely industrial, commercial, and transportation (or bunkering) residual fuel uses. However, it is apparent that these sectors must have experienced relatively sharp decreases in residual fuel use, particularly in the third quarter of 1983 when utility use of residual fuel increased but total residual fuel demand decreased. The reasons for this decrease in residual fuel demand in 1983 are still not clear, as all the indicators of demand would have suggested an increase in demand for this fuel.

Other Petroleum Products

The "other" petroleum products category includes jet fuel, liquefied petroleum gases (excluding ethane), petroleum coke, kerosene, road oil and asphalt, still gas, petrochemical feedstocks and ethane, waxes, lubricants, aviation gasoline, special naphthas, unfinished oils, aviation and motor gasoline blending components, and miscellaneous products. The three principle components of "other" petroleum are jet fuel, liquefied petroleum gas (excluding ethane), and petrochemical feedstocks plus ethane. Consumption of these products amounted to 2.90 million barrels per day out of total "other" product consumption of 4.48 million barrels per day in 1983.

Jet fuel consumption, which remained constant at 1.01 million barrels per day in 1981 and 1982, increased moderately during 1983 to 1.04 million barrels per day. Consumption of jet fuel is expected to grow to 1.11 million barrels per day in 1984 and to 1.15 million barrels per day in the first half of 1985. Primarily responsible for these increases is an expected upturn in domestic air travel (both business and pleasure) in response to the continued economic recovery.

Consumption of liquefied petroleum gases (LPG's), excluding ethane, fell by 3.3 percent in 1983 from an average of 0.99 million barrels per day in 1982. Conservation and competition from alternate fuels are key factors explaining the decline to date in the demand for total LPG and for propane (which is the major component of LPG) in particular. This declining trend is expected to continue, with projected average daily consumption falling to 0.83 million barrels in the first 6 months of 1985.

Demand for petrochemical feedstocks and ethane is expected to recover strongly in 1984 and the first half of 1985, after falling significantly over the past 2 years. Daily consumption is expected to average 1.1 million barrels per day for the first 6 months of 1985, compared to consumption of 0.9 million barrels per day for the same period in 1983. The projected rebound in demand for petrochemical feedstocks and ethane corresponds to expectations for growth in the chemical industry.

Demand for the remaining "other" petroleum products is expected to remain fairly constant, with projected consumption of 1.7 million barrels per day in 1984 and 1.6 million barrels per day in the first half of 1985. Product supplied of these remaining "other" products totaled 1.58 million barrels per day in 1983.

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Demand for "other" petroleum products, including LPG, jet fuel, feedstocks, and the remaining categories, amounted to almost 30 percent of demand for all petroleum products in 1983. The projections for the combined "other" category are provided in Table 6.[2] These estimates represent the total for all of the products indicated above, with the miscellaneous category defined to include natural gasoline, isopentane, unfractionated stream, plant condensate, and reclassified products.

Projections for Other Major Energy Sources

Natural Gas

Total U.S. natural gas consumption and production are forecast to increase by 4.5 percent and 7.2 percent, respectively, between 1983 and 1984, ending a 4-year decline. Projected levels of natural gas consumption and production in all the forecast quarters are higher than year-earlier levels (see Table 14). In the first quarter of 1984, domestic natural gas consumption is expected to rise by 8.6 percent while domestic gas production increases by 5.9 percent from year-earlier levels. The projected turnaround in natural gas demand is contingent on the effects of a strong economic recovery and the apparent moderation in natural gas price increases.

Natural Gas Demand. Total industrial, residential, and commercial consumption of natural gas (shown on Table 14 as "All Other Uses") is forecast to increase by 4.8 percent to 14.1 trillion cubic feet between 1983 and 1984. Natural gas demand apparently did not respond to the economic recovery in 1983: Despite a 7.9-percent growth in industrial activity between 1982 and 1983, consumption of natural gas (excluding use at electric utilities) fell by 5.0 percent over that period. Total industrial, residential, and commercial gas use in the fourth quarter of 1983 did increase by about 8 percent from year-earlier levels, but this growth is largely attributable to the higher heating requirements as a result of the severe December weather.

By the first quarter of 1984, total gas demand for the three sectors combined is forecast to be about 9.6 percent above the year-earlier level, mostly as a result of a colder-than-normal January. This increasing trend is expected to continue through 1984, based on the high rate of growth assumed for industrial production and the much lower increases expected for the price of natural gas compared with increases during the past several years. The forecast of continued economic growth and the assumption of normal heating-season requirements result in a forecast of natural gas demand for the combined industrial, residential, and commercial sectors in the first half of 1985 that is 2.1 percent above year-earlier levels.

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[2]Table 6 provides data and forecasts for the aggregate "other" category only. Data through 1983 for the individual components of "other" petroleum products are available in the Petroleum Supply Monthly. Detailed forecasts for the individual components are available through the Division of Energy Analysis and Forecasting (EIA/Department of Energy).

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Electric utility demand for natural gas declined by 9.9 percent from 1982 to 1983. In the first half of 1983, electric utility natural gas consumption was 16 percent below year-earlier levels due to the decline in total electricity generation, the high prices for gas, and the record high level of hydroelectric generation. Despite the rapid rise in total electricity generation in the third quarter of 1983 (as a result of the summer heat wave), gas use at electric utilities was about 4 percent below year-earlier levels. Similarly, while electricity demand in the fourth quarter of 1983 was 8.7 percent over year-earlier levels, natural gas use at electric utilities actually declined over the same period. In 1984, electric utility demand for natural gas is projected to be only 2.4 percent above the 1983 level, despite the forecast 4.3-percent increase in total electricity generation. This low utility demand for natural gas is due to expected large increases in coal-fired and nuclear-powered capacity to generate electricity and continued higher-than-normal generation from hydroelectricity.

Natural Gas Supply. Domestic production of natural gas is projected to be 17.0 trillion cubic feet in 1984, which is 7.1 percent above the 1983 level and is the highest level in 2 years. In 1983, only 15.9 trillion cubic feet of natural gas were produced (compared with the record level of 21.7 trillion cubic feet produced in 1973), reflecting the depressed level of natural gas demand. Total dry gas production during the first half of 1985 is expected to rise by 3.4 percent over the corresponding period in 1984.

Imports of Algerian liquefied natural gas (LNG) during 1983 were about 136 billion cubic feet, over twice the amount received in 1982, while U.S. exports of LNG from Alaska remained level. In the forecast period, U.S. exports of LNG are expected to remain essentially unchanged. LNG imports from Algeria are expected to drop to about 2.8 billion cubic feet per month, following the decision by a major U.S. importer to discontinue LNG imports from Algeria due to the high Algerian price.

Coal

Domestic coal consumption should total approximately 737 million tons in 1983, an increase of 4.2 percent above 1982 levels. (See Table 15.) If total electricity generation grows at the projected rate of 4.3 percent in 1984 (see Table 16), domestic demand for coal is expected to exhibit strong growth, barring any shortages that could be caused by an extended coal strike. Consumption of coal by electric utilities could increase by 37 million tons in 1984, or by 5.9 percent, over 1983 levels. If domestic raw steel production increases by as little as 3 percent in 1984, consumption of coal in the manufacture of coke could increase by as much as 18 percent. This increase in coking coal consumption assumes that coke stocks, which were greatly diminished during 1983, will not be significantly reduced during 1984. By comparison, in the first 9 months of 1983, coke stocks were drawn down by 4.3 million tons, the equivalent of over 6 million tons of coal.

It should be noted that the forecast demand for coking coal of 46 million tons in 1984 remains well below prerecession levels. Only a very slight improvement for coal exports is likely for 1984. Although record trade deficits may exert some downward pressure on the foreign currency price of the dollar for some coal-importing countries, expanded export capability of coal exporters (South Africa, Australia, and Colombia) competing with the United States and sluggish demand

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growth in consuming countries reduces the likelihood of a major near-term revival in U.S. coal exports.

Coal Production. Domestic production of 785 million tons of coal in 1983 was about 6 percent less than the amount produced in 1982. To a large extent, the lower production level in 1983 occurred because much of the additional demand for coal in 1983 was met through reductions in both primary and secondary stocks, whereas there was an equally large buildup of coal stocks in 1982. If overall domestic demand for U.S. coal increases at the forecasted rate of 6.4-percent between 1983 and 1984, it is estimated that coal production would have to increase by 8.7 percent during that same period. Moreover, new domestic supply (production plus producer stock change plus imports minus exports) would need to increase by about 11 percent. To the extent that an increase of this magnitude in domestic coal deliveries encounters bottlenecks or other constraints, domestic coal consumption may be less than forecast.

Effects of Labor Contract Negotiations. The coal production and stock level forecasts presented in Table 15 were developed under the assumption that there will be no coal strike in 1984. The current contract between the United Mine Workers of America and the Bituminous Coal Operators Association expires at the end of September 1984. Historically, normal patterns of production and stock withdrawal have been altered in anticipation of impending coal contract negotiations, and the current forecast takes this behavior into account by modifying the quarterly pattern of behavior. In particular, it is assumed that production is increased and consumer stock drawdowns are avoided in the third quarter of 1984. Should a strike actually occur, it is likely that both production and stocks will be less at the end of 1984 than the levels forecast here.

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Utility Coal Consumption: A Divergence of Viewpoints

Most of the forecast growth in domestic coal consumption for 1984 is the
result of the projected growth in electricity generation from coal-fired
plants in the United States. That the demand for coal to generate
electricity will increase during 1984 at the projected rate of 5.9 percent
is a viewpoint not generally shared by industry analysts. For example, the
National Coal Association (NCA) in December 1983 projected a growth rate of
1.3 percent for domestic utility coal consumption between 1983 and 1984.[3]
More recently, the NCA has informally indicated that a 2.5-percent growth
rate in domestic utility coal consumption can be expected in 1984. On the
other hand, a recent survey conducted by a coal industry trade journal
indicated that, as of November 1983, domestic coal producers expected an
increase of about 4.8 percent in electric utilities' demand for coal in
1984.[4] Data Resources, Inc., (DRI) recently forecast utility coal
consumption growth of 4.3 percent for 1983-1984.[5] It should be noted
that coal consumed at utilities increased by 5.4 percent from 1982 to 1983,
even though the growth rate of total electricity generation over this
period was only 3.0 percent. The forecast for this Outlook assumes that
utility coal consumption will grow at a rate nearly 40 percent higher than
that for total electricity generation in 1984.

The disparities among the various forecasts of electric utility coal consump-
tion stem from differences of opinion regarding the strength of the recovery
in overall electricity demand as well as from differences in assumptions
concerning the role of fuels other than coal in meeting new electricity
demand. Implicit in the forecast for coal consumption by utilities in this
Outlook is that the addition of new, more efficient coal-generating capacity,
combined with higher average utilization of existing coal plants in 1984, will
be sufficient to raise the coal-fired share of total domestic electricity
generation to 55.2 percent from the 54.6 percent level experienced in 1983.
The interruption of coal deliveries to electric utilities as a result of a
coal strike or other supply problems could preclude this increase in the share
of coal-fired generation.

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[3]National Coal Association, Coal News (Washington, D.C., December 19,
1983), p. 3.
[4]Coal Mining and Processing (Chicago, Illinois, January 1984), p. 26.
[5]Data Resources, Inc., Energy Review: Winter 1983-1984 (Lexington,
Massachusetts, 1984), p. 137.

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Electric Power

Total electricity generation in 1982 was 2,241 billion kilowatt-hours, a 2.3-
percent decline from the 1981 level (see Table 16). Generation during the first
half of 1983 continued to lag behind historical levels, falling 2.4 percent below
year-earlier levels, primarily because of unusually mild weather and the slow
recovery of industrial electricity demand. A turning point in generation occurred
during the second half of 1983, when abnormal weather (a warmer-than-normal summer
and a colder-than-normal December) and rising economic activity led to an 8.4-
percent increase in electricity generation in the second half of 1983 compared to
year-earlier levels. Industrial demand for electricity has shown a strong rebound
in the second half of 1983 as a result of the rapid recovery in industrial
production. Total electricity generation in 1983 was 2,309 billion kilowatt-hours,
3 percent above the level in 1982.

Electricity generation in 1984 is projected to be 2,407 billion kilowatt-hours, a
4.3-percent increase from the 1983 level. This estimated rate of growth in genera-
tion between 1983 and 1984 is slightly higher than the forecast published in the
November 1983 Outlook, based on a higher projected growth in personal income and
the expected continuation of the strong recovery in industrial demand for
electricity. Electricity generation between first-half 1984 and first-half 1985 is
projected to increase by 2.9 percent, based on the assumed continuation of the
economic recovery. If economic activity does not achieve the growth rates assumed
in the base case (including growth in disposable personal income of 4.6 percent
between 1983 and 1984 and 3.2 percent between first-half 1984 and first-half 1985)
or if the turnaround in industrial electricity demand is not as strong as expected,
total electricity demand could be lower than the levels forecast here. For
example, assumed growth in personal income of only 3.0 percent between 1983 and
1984 would result in a forecasted increase in electricity generation of only 2.9
percent, to 2,375 billion kilowatt-hours in 1984, which would translate into lower
fuel demands, especially for coal.

The nominal price of residential electricity, which increased at double-digit rates
in 1981 and 1982, increased by less than 5 percent between 1982 and 1983; it is
expected to increase only 3.8 percent from 1983 to 1984. Yields for newly issued
utility bonds are forecast to be lower in 1983 and 1984 than in 1982. In addition,
increases in the nominal cost of fuel to electric utilities between 1983 and 1984
are expected to be more moderate than in years prior to 1983. Based on similar
trends during the first half of 1985, residential electricity prices are forecast
to increase by 4.3 percent between first-half 1984 and first-half 1985.

Generation by Energy Source. Fuel shares of electricity generation in 1984 are
expected to be: 55 percent coal, 12 percent natural gas, 13 percent nuclear power,
6 percent petroleum, 13 percent hydroelectric power, and less than 1 percent for
other energy sources. (See Table 16.) The forecast increase in total generation
of 98 billion kilowatt-hours from 1983 to 1984 is projected to be supplied
primarily by increases in generation from coal and nuclear power. (See Figure 6.)
A continuation of this trend is forecast, with a projected total increase of 42
billion kilowatt-hours from coal generation and 22 billion kilowatt-hours from
nuclear power between first-half 1984 and first-half 1985.

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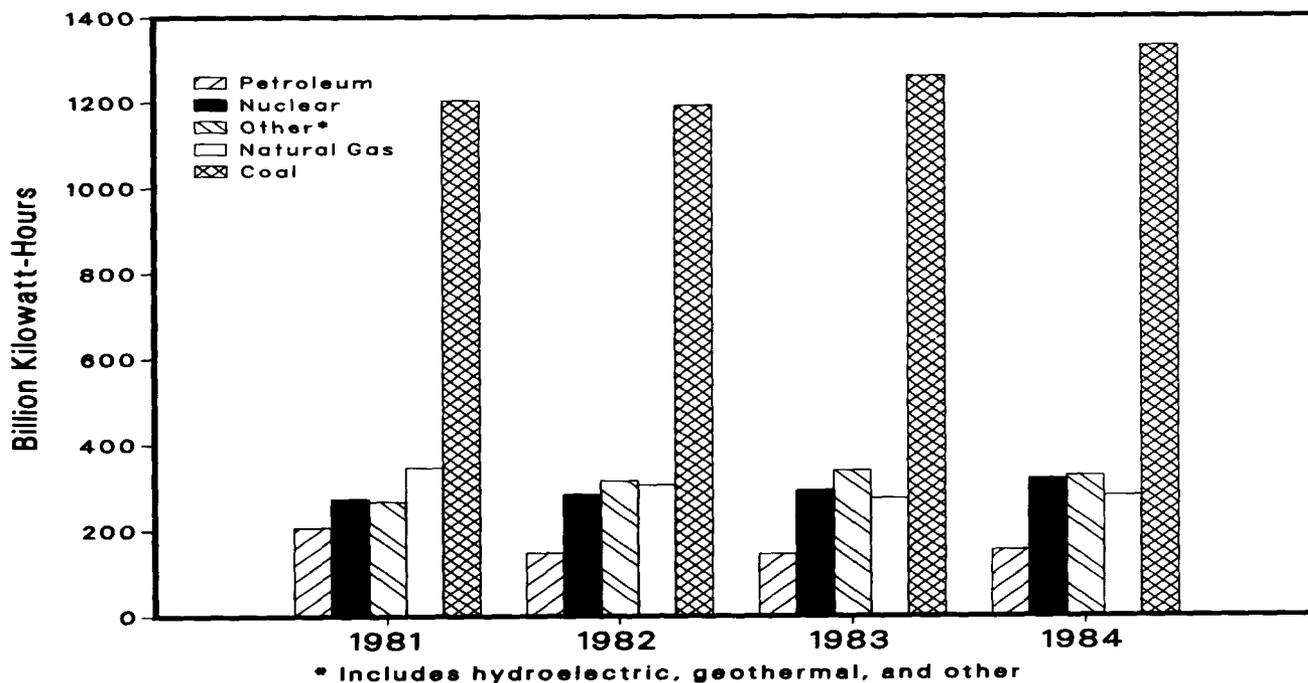
Figure 6. Electricity Generation by Fuel Source

Electricity generation from nuclear power was 292 billion kilowatt-hours in 1983, 3.3 percent above the 1982 level. Seven new units (Susquehanna 1, Summer 1, St. Lucie 2, San Onofre 2, LaSalle 1, McGuire 2, and San Onofre 3) began full power operation in 1983. The 9.0-percent increase in nuclear generation projected from 1983 to 1984 results from the combination of new reactors coming online and the maturing of several existing reactors. This forecast assumes full power operation of 8 new reactors totaling 9.1 gigawatts in 1984 and 4 new reactors totaling 4.3 gigawatts during the first half of 1985. Of the 12 reactors expected to begin producing electricity by mid-1985, 10 reactors serve areas where oil or gas is consumed by electric utilities. These new units could be expected to reduce oil and gas consumption for baseload generation and also to partially compensate for the high level of hydroelectric generation that was available in 1982 and 1983.

Coal-fired generation increased by 5.7 percent from 1982 to 1983. In the absence of a prolonged coal strike in the fall of 1984, coal-fired generation of elec- tricity is expected to increase by 5.6 percent from 1983 to 1984 as the demand for electricity increases and as new coal generating capacity begins operation. Following the projected addition of more than 6 gigawatts of coal-fired capacity in 1983, more than 9 additional gigawatts of capacity are expected to begin operation in 1984. The outlook for coal-fired generation during the first half of 1985 shows a 6.5-percent increase over the year-earlier level, with an addition of about 5 gigawatts of new generation capacity during this period.

Although the increases in coal-fired generation over the forecast period may appear large, the combined effects of newly available coal capacity, lower levels of hydroelectric generation (which was nearly 55 billion kilowatt-hours above normal levels in 1983), and the 4.3-percent increase in total generation between 1983 and

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1984 are forecast to result in coal-fired generation of 1,330 billion kilowatt-hours in 1984. Because nuclear-powered and coal-fired generation are the least expensive means of increasing electricity output given the current generating stock (excluding hydroelectric capacity), plants consuming these fuels are expected to be utilized where they are available. Where nuclear-powered or coal-fired generation are not available, electric utilities would be expected to use oil and natural gas to meet incremental generation demands.

Hydroelectric generation in 1983 was a record-breaking 332 billion kilowatt-hours, 7.4 percent above the previous record set in 1982 and 17 percent above normal levels. The current high water availability is projected to result in higher than normal hydroelectric generation through the first half of 1984, with total 1984 generation forecast to reach 319 billion kilowatt-hours (assuming normal weather and precipitation patterns during this period). With the return to assumed normal weather in 1985, a decrease of 16 percent in hydropower generation is expected between first-half 1984 and first-half 1985.

Oil and natural gas consumption by electric utilities has decreased over the past 4 years in both absolute and percentage terms. Combined generation from oil and natural gas in 1983 dropped over 7 percent from the 1982 level as a result of increased shares from coal and nuclear power and increased availability of hydropower. Between 1983 and 1984, the resurgence in electricity demand and the lower levels of hydroelectric generation lead to the projected 3.5-percent increase in oil and gas generation of about 14 billion kilowatt-hours. Generation from these two sources is expected to remain fairly stable between first-half 1984 and first-half 1985: the drop in hydroelectric generation is balanced by an increase in nuclear- and coal-fired generation, leaving little change in the remaining share needed from oil and gas generation. If the actual level of electricity generation from coal and nuclear power in 1984 is lower or the growth in demand is higher than forecast here, consumption of oil and natural gas at electric utilities most likely will be higher.

Total Domestic Energy Balance

U.S. energy consumption (measured as gross energy consumption) in 1983 was 70.7 quadrillion Btu, slightly lower than the 1982 level (see Table 17). In 1984, total energy consumption is projected to increase for the first time since 1979, reaching 73.8 quadrillion Btu (see Figure 7). The projected 4.5-percent increase in total energy consumption from 1983 to 1984 is based on real GNP increasing by 5.3 percent over that period. Between first-half 1984 and first-half 1985, total energy consumption is forecast to increase by 1.9 percent.

With the GNP forecasted to grow faster than energy consumption from 1983 to 1984, the energy/GNP ratio is projected to decrease for the 14th consecutive year. The energy intensity of U.S. economic activity is projected to fall to 46.1 thousand Btu per 1972 dollar in 1983 and then decrease to 45.7 thousand Btu per 1972 dollar in 1984. This decrease in the energy-intensity of the economy is expected to continue through mid-1985.

* Includes nuclear, hydroelectric, geothermal, and other
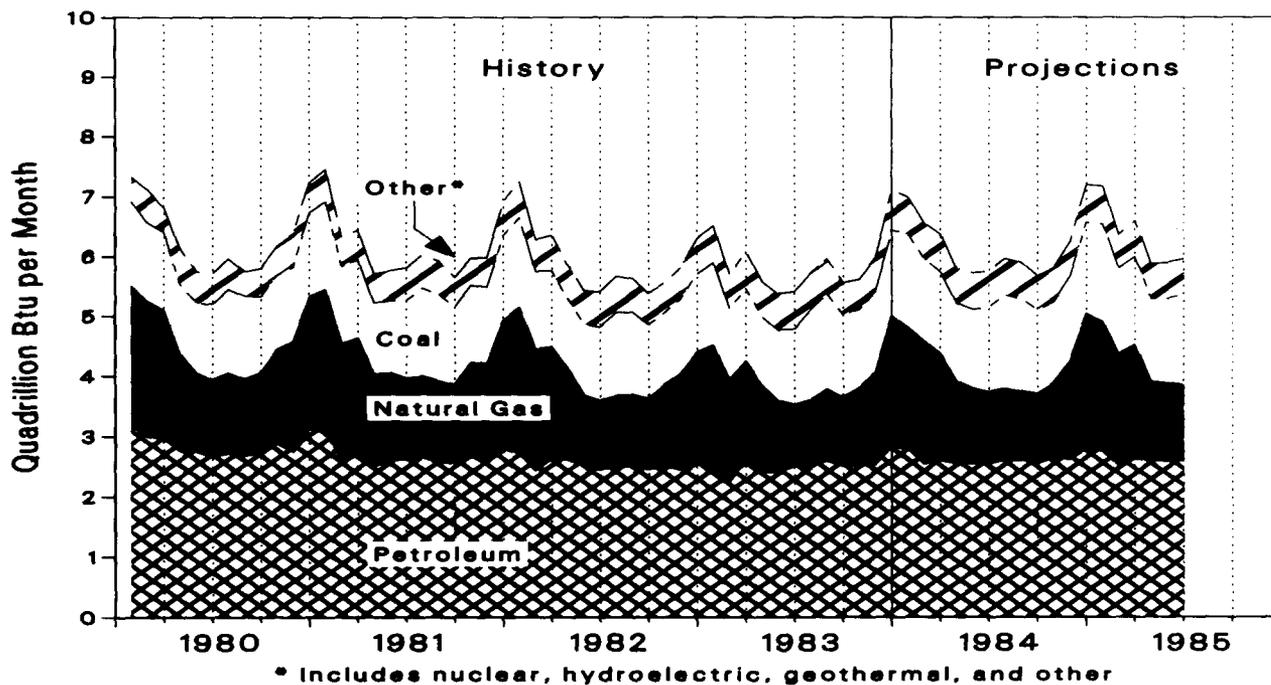
Figure 7. Gross Energy Consumption by Source

Consumption of energy by each major source (except hydroelectricity) is projected to increase from 1983 to 1984. These trends in fuel use are projected to continue in the first half of 1985. U.S. energy production declined by 4.2 percent from 1982 to 1983 and then is projected to increase by 4.8 percent from 1983 to 1984. Net imports of energy are projected to increase by 22.3 percent from 1983 to 1984 to provide 13.5 percent of the total U.S. energy supplies.

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Table 2. Macroeconomic, Price, and Weather Data Assumptions for Low, Base, and High Economic Growth Cases

	History											Projections							
	1981	1982					1983					Economic	1984					1985	
Assumptions	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	Growth	1st	2nd	3rd	4th	Year	1st	2nd
Macroeconomic (billion 1972 dollars)																			
Real Gross National Product[a]	1,514	1,486	1,489	1,486	1,481	1,485	1,490	1,525	1,553	1,571	1,535	High	1,595	1,614	1,636	1,656	1,625	1,674	1,691
												Base	1,592	1,607	1,625	1,641	1,616	1,653	1,663
												Low	1,590	1,599	1,609	1,617	1,604	1,619	1,622
Percent Change from Prior Year	2.6	-1.6	-1.6	-2.6	-1.7	-1.9	0.3	2.4	4.5	6.1	3.4	High	7.0	5.8	5.3	5.4	5.9	5.0	4.8
												Base	6.8	5.4	4.6	4.5	5.3	3.8	3.5
												Low	6.7	4.8	3.6	2.9	4.5	1.8	1.4
GNP Implicit Price Deflator (Index, 1972=100)	195.1	203.4	206.1	208.0	210.0	206.9	212.8	214.6	216.4	218.5	215.6	High	221.2	223.1	224.8	226.9	224.0	228.7	230.6
												Base	221.3	223.5	225.8	228.5	224.8	230.9	233.4
												Low	221.7	224.1	226.6	229.8	225.5	233.0	236.4
Percent Change from Prior Year	9.3	7.2	7.0	5.6	4.4	6.0	4.6	4.1	4.0	4.0	4.2	High	3.9	4.0	3.9	3.8	3.9	3.4	3.4
												Base	4.0	4.1	4.3	4.6	4.3	4.3	4.4
												Low	4.2	4.4	4.7	5.2	4.6	5.1	5.5
Real Disposable Personal Income[b]	1,055	1,055	1,060	1,059	1,066	1,060	1,074	1,083	1,100	1,120	1,094	High	1,133	1,139	1,148	1,159	1,145	1,173	1,182
												Base	1,133	1,139	1,148	1,158	1,144	1,169	1,176
												Low	1,132	1,134	1,138	1,142	1,137	1,150	1,150
Percent Change from Prior Year	3.3	1.3	1.3	-0.8	0.2	0.5	1.8	2.2	3.9	5.1	3.2	High	5.5	5.2	4.4	3.5	4.7	3.5	3.8
												Base	5.5	5.2	4.4	3.4	4.6	3.2	3.2
												Low	5.4	4.7	3.5	2.0	3.9	1.6	1.4
Index of Industrial Production (MFG) (Index, 1967=100)	150.3	139.8	138.1	137.7	134.5	137.5	138.4	145.2	152.8	157.1	148.4	High	160.6	163.8	166.8	170.3	165.4	173.7	176.4
												Base	160.0	162.1	164.1	166.3	163.1	168.2	169.6
												Low	159.4	159.9	160.2	160.5	160.0	160.2	160.1
Percent Change from Prior Year	2.4	-7.6	-9.4	-9.7	-7.2	-8.5	-1.0	5.1	11.0	16.8	7.9	High	16.0	12.8	9.2	8.4	11.5	8.2	7.7
												Base	15.6	11.6	7.4	5.9	9.9	5.1	4.6
												Low	15.2	10.1	4.8	2.2	7.8	0.5	0.1
Oil Price (U.S. nominal dollars/barrel)																			
Imported Crude Oil Prices[c]	37.05	35.03	33.13	33.14	33.07	33.55	30.20	28.57	29.27	29.35	29.35	High	27.62	25.00	25.00	25.00	25.66	25.00	25.00
												Base	29.00	29.00	29.00	29.00	29.00	29.00	29.00
												Low	29.21	29.82	30.44	31.13	30.15	31.81	32.50
U.S. Refiners' Cost[d]	35.24	33.05	31.20	31.53	31.78	31.87	29.62	28.61	28.87	28.93	29.01	High	27.62	25.00	25.00	25.00	25.66	25.00	25.00
												Base	29.00	29.00	29.00	29.00	29.00	29.00	29.00
												Low	29.21	29.82	30.44	31.13	30.15	31.81	32.50
Weather[e] (number of degree days)																			
Heating Degree Days	4,653	2,542	600	105	1,507	4,754	2,227	660	84	1,785	4,756		2,458	539	88	1,669	4,754	2,398	539
Cooling Degree Days	1,167	36	294	703	65	1,098	19	268	871	74	1,232		28	327	755	63	1,173	28	327

[a] Macroeconomic projections from three DRI model forecasts are seasonally adjusted at annual rates, and modified as appropriate to the three world oil price cases. Historical data: U.S. Department of Commerce, Survey of Current Business, January 1984.
[b] Seasonally adjusted at annual rates.
[c] Cost of imported crude oil to U.S. refiners.
[d] U.S. refiners' acquisition costs of foreign and domestic crude oil.
[e] Population-weighted average degree days, revised December 1981.

Sources: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/12[3]), Bureau of Economic Analysis, U.S. Department of Commerce, Survey of Current Business, as revised, January 1984; National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Monthly State, Regional, and National Heating Degree Days Weighted by Population, January 1984; and the Federal Reserve System, Data Release G.12.3., January 1984. Macroeconomic forecasts based on modifications to Data Resources, Inc., forecasts CONTROL012484, OPTIM012684, and BAD84012684.

Table 3. Short-Term Energy Prices (Nominal), History and Projections

Product	History 1982 Year	1983 1st	2nd	3rd	4th	Year	Price[1]	Projections 1984 1st	2nd	3rd	4th	Year	1985 1st	2nd
Petroleum														
Gasoline[2] (dollars per gallon)	1.28	1.17	1.23	1.27	1.23	1.22	Low	1.20	1.14	1.12	1.10	1.14	1.11	1.13
							Base	1.21	1.22	1.23	1.21	1.22	1.22	1.25
							High	1.23	1.27	1.30	1.30	1.28	1.31	1.34
No. 2 Heating Oil, Wholesale[3] (dollars per gallon)	0.91	0.85	0.82	0.82	0.83	0.83	Low	0.81	0.74	0.74	0.75	0.76	0.75	0.75
							Base	0.85	0.84	0.84	0.84	0.84	0.85	0.85
							High	0.88	0.89	0.91	0.93	0.90	0.91	0.93
No. 2 Heating Oil, Retail (dollars per gallon)	1.19	1.10	1.04	1.05	1.06	1.07	Low	1.08	0.99	0.99	1.00	1.02	1.02	1.01
							Base	1.11	1.09	1.08	1.10	1.10	1.11	1.11
							High	1.15	1.14	1.15	1.18	1.16	1.18	1.19
No. 6 Residual Fuel Oil[4] (dollars per gallon)	0.69	0.62	0.63	0.67	0.69	0.65	Low	0.67	0.59	0.57	0.60	0.61	0.62	0.59
							Base	0.70	0.66	0.64	0.68	0.67	0.69	0.66
							High	0.70	0.69	0.69	0.74	0.71	0.75	0.73
Kerosene-Based Jet Fuel (dollars per gallon)	0.97	0.93	0.88	0.86	0.86	0.88	Low	0.85	0.80	0.77	0.76	0.80	0.76	0.75
							Base	0.87	0.87	0.87	0.87	0.87	0.87	0.87
							High	0.89	0.91	0.94	0.96	0.92	0.96	0.97
Other														
Coal, Delivered to Utilities (dollars per million Btu)	1.65	1.67	1.67	1.65	1.65	1.66	Low	1.63	1.64	1.66	1.68	1.65	1.70	1.72
							Base	1.67	1.69	1.70	1.72	1.70	1.74	1.76
							High	1.70	1.72	1.74	1.77	1.73	1.78	1.80
Natural Gas, Residential[5] (dollars per 1,000 cu. ft.)	5.17	5.87	6.13	6.17	6.05	6.05	Low	6.02	6.16	6.17	6.13	6.12	6.03	6.18
							Base	--	--	--	--	--	--	--
							High	6.20	6.51	6.71	6.84	6.57	6.93	7.34
Natural Gas, to Utilities (dollars per million Btu)	3.41	3.38	3.39	3.61	3.43	3.45	Low	3.39	3.53	3.64	3.37	3.48	3.40	3.55
							Base	--	--	--	--	--	--	--
							High	3.54	3.71	3.95	3.63	3.71	3.75	4.04
Electricity, Residential (cents per kilowatt-hour)	6.86	6.77	7.17	7.52	7.20	7.17	Low	6.79	7.36	7.65	7.21	7.25	7.02	7.68
							Base	6.95	7.54	7.85	7.41	7.44	7.22	7.89
							High	7.11	7.73	8.05	7.61	7.62	7.42	8.12

[1]The low prices are used with the high economic growth assumptions and the high prices are used with the low economic growth assumptions referred to in Table 2.

[2]Average for all grades and services.

[3]Wholesale No. 2 heating oil prices for 1982 are from the Monthly Petroleum Product Price Report.

[4]Retail residual fuel oil--average, all sulfur contents.

[5]New natural gas price series; see discussion in Energy Product Prices section.

-- = Not applicable.

Note: Fourth quarter 1983 estimated for all fuels except gasoline and residential natural gas.

Sources: Historical data: Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(83/12<3>), Petroleum Marketing Monthly, DOE/EIA-0380(83/12<3>), and Monthly Petroleum Product Price Report, DOE/EIA-0032(82/13). All prices exclude taxes except gasoline, residential natural gas, and electricity. For 1982 only, the retail heating oil price includes taxes.

Table 4. International Petroleum Balance
(Million Barrels per Day, Except Closing Stocks)

	1982 Year	History 1983					Projections 1984					1985	
		1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply[1]													
Production													
U.S. (50 States)	10.8	10.8	10.7	10.7	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.9	10.9
OPEC	19.7	16.3	17.6	20.1	20.1	18.6	19.0	18.1	20.0	21.4	19.6	20.3	19.8
Other Non-OPEC	12.6	13.1	13.3	13.6	13.9	13.5	13.6	13.9	14.2	14.5	14.1	14.5	14.6
Total Market Economies	43.1	40.2	41.7	44.5	44.8	42.8	43.4	42.8	44.9	46.7	44.5	45.7	45.3
Net Communist Exports	1.7	1.5	2.1	1.8	1.8	1.8	1.4	2.0	1.7	1.7	1.7	1.3	1.9
Total Supply	44.8	41.7	43.7	46.3	46.6	44.6	44.8	44.8	46.6	48.4	46.2	47.0	47.2
Net Stock Withdrawals (+) or Additions (-)													
U.S. (50 States excl. SPR)	0.3	1.2	-0.1	-0.6	0.6	0.3	0.6	-0.2	-0.7	0.1	-0.1	0.6	-0.4
U.S. SPR	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1
Other Market Economies	1.0	3.4	0.4	-1.0	-0.5	0.6	2.2	0.3	-1.2	-0.8	0.1	0.9	-1.0
Total Stock Withdrawals (+)	1.1	4.4	0.1	-1.9	-0.0	0.6	2.7	-0.2	-2.0	-0.9	-0.1	1.3	-1.6
Product Supplied													
U.S. (50 States)	15.3	15.0	14.8	15.2	15.7	15.2	15.9	15.4	15.5	16.0	15.7	16.0	15.7
U.S. Territories	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Japan	4.6	4.9	4.0	4.3	4.8	4.5	5.0	4.0	4.2	4.8	4.5	5.1	4.2
OECD Europe	12.2	12.5	11.5	11.1	12.1	11.8	12.8	11.5	11.2	12.8	12.1	13.2	11.9
Other Market Economies	13.4	13.3	13.3	13.4	13.6	13.4	13.5	13.4	13.5	13.6	13.5	13.7	13.5
Total Market Economies	45.9	46.0	43.8	44.4	46.5	45.2	47.5	44.6	44.6	47.5	46.1	48.4	45.6
Closing Stocks (Billion Barrels)	4.9	4.5	4.5	4.7	4.7	4.7	4.5	4.5	4.7	4.8	4.8	4.6	4.8

[1]Includes production of crude oil and natural gas liquids, other hydrogen and hydrocarbons for refinery feedstock, refinery gains, and net exports from Communist countries.

Note: Minor discrepancies with other published EIA historical data are due to rounding.

Sources: Energy Information Administration, Monthly Energy Review, DOE/EIA 0035(83/12(2)) and 1982 International Energy Annual (DOE/EIA-0219(82)); Organization for Economic Cooperation and Development, Quarterly Oil Statistics, Third Quarter 1983; and Petroleum Economics Limited's World Quarterly Primary Energy and Supply/Demand, October 24, 1983.

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

| | History | | | | | | Projections | | | | | | |
| | 1982 | 1983 | | | | | 1984 | | | | | 1985 | |
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Production													
Crude Oil	8.65	8.66	8.68	8.65	8.63	8.66	8.70	8.68	8.62	8.61	8.65	8.70	8.66
Alaska, North Slope	1.62	1.64	1.64	1.64	1.65	1.64	1.67	1.66	1.64	1.64	1.65	1.76	1.75
Subarctic[1]	7.03	7.01	7.04	7.02	6.98	7.01	7.03	7.02	6.98	6.97	7.00	6.93	6.91
Natural Gas Liquids	1.55	1.60	1.50	1.56	1.59	1.56	1.60	1.56	1.55	1.61	1.58	1.67	1.62
Other Domestic	0.05	0.05	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Processing Gain	0.53	0.47	0.48	0.47	0.50	0.48	0.49	0.52	0.52	0.52	0.51	0.49	0.52
Total Production	10.76	10.77	10.72	10.74	10.78	10.75	10.84	10.81	10.75	10.79	10.80	10.91	10.85
Imports (including SPR)													
Crude Oil	3.49	2.49	3.30	4.09	3.34	3.31	3.42	4.15	4.49	4.13	4.05	3.56	4.47
Refined Products	1.62	1.42	1.66	1.85	1.81	1.69	1.91	1.69	1.77	1.87	1.81	1.81	1.69
Total Imports	5.11	3.90	4.95	5.94	5.16	4.99	5.33	5.84	6.26	6.01	5.86	5.37	6.17
Exports													
Crude Oil	0.24	0.18	0.17	0.16	0.14	0.16	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Refined Products	0.58	0.70	0.64	0.47	0.49	0.57	0.53	0.54	0.54	0.53	0.54	0.55	0.57
Total Exports	0.82	0.88	0.81	0.64	0.63	0.74	0.71	0.73	0.73	0.72	0.72	0.74	0.75
Net Imports (incl SPR)	4.30	3.02	4.14	5.30	4.53	4.25	4.62	5.11	5.53	5.29	5.14	4.64	5.41
Primary Stock Levels[2]													
(million barrels)													
Opening	1255.31	1168.19	1063.61	1076.77	1131.15	1168.19	1074.01	1016.35	1039.05	1104.57	1074.01	1096.46	1040.09
Closing	1136.10	1063.61	1076.77	1131.15	1074.01	1074.01	1016.35	1039.05	1104.57	1096.46	1096.46	1040.09	1077.53
Net Withdrawals (million barrels per day)	0.32	1.16	-0.14	-0.59	0.62	0.26	0.63	-0.25	-0.71	0.09	-0.06	0.63	-0.41
SPR Fill Rate Additions(-) (million barrels per day)	-0.17	-0.20	-0.23	-0.31	-0.20	-0.23	-0.18	-0.25	-0.12	-0.14	-0.17	-0.14	-0.14
Total Primary Supply	15.23	14.76	14.49	15.14	15.73	15.03	15.92	15.43	15.45	16.02	15.70	16.02	15.71
Product Supplied													
Motor Gasoline	6.54	6.29	6.68	6.81	6.69	6.62	6.45	6.79	6.91	6.65	6.70	6.27	6.62
Distillate Fuel Oil	2.67	2.83	2.52	2.43	2.95	2.68	3.16	2.70	2.35	3.01	2.80	3.20	2.88
Residual Fuel Oil	1.72	1.57	1.33	1.33	1.38	1.40	1.74	1.46	1.35	1.49	1.51	1.87	1.51
Other Products[3]	4.37	4.32	4.23	4.66	4.71	4.48	4.57	4.47	4.84	4.86	4.69	4.69	4.69
Total Product Supplied	15.30	15.01	14.76	15.22	15.73	15.18	15.92	15.43	15.45	16.02	15.70	16.02	15.71
Unaccounted for	-0.07	-0.26	-0.27	-0.09	0.00	-0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Disposition	15.23	14.76	14.49	15.14	15.73	15.03	15.92	15.43	15.45	16.02	15.70	16.02	15.71

SPR = Strategic Petroleum Reserve.
[1] Lower-48 States and southern Alaska.
[2] Excludes crude oil for the Strategic Petroleum Reserve (SPR). The respondent universe for
petroleum inventories was expanded in January 1983. This resulted in the addition of 32 million
barrels to total petroleum stocks at the close of December 31, 1982. (See the Petroleum
Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)
[3] Includes Reclassified Petroleum Products.
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), and
Petroleum Supply Monthly DOE/EIA-0109(83/12(3)).

Table 7. Quarterly Supply and Disposition of Petroleum: High Economic Growth Case
(Million Barrels per Day, Except Stocks)

		History					Projections						
	1982	1983					1984					1985	
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Production													
Crude Oil	8.65	8.66	8.68	8.65	8.63	8.66	8.70	8.68	8.62	8.61	8.65	8.70	8.66
Alaska, North Slope	1.62	1.64	1.64	1.64	1.65	1.64	1.67	1.66	1.64	1.64	1.65	1.76	1.75
Subarctic[1]	7.03	7.01	7.04	7.02	6.98	7.01	7.03	7.02	6.98	6.97	7.00	6.93	6.91
Natural Gas Liquids	1.55	1.60	1.50	1.56	1.59	1.56	1.60	1.56	1.55	1.61	1.58	1.67	1.62
Other Domestic	0.05	0.05	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Processing Gain	0.53	0.47	0.48	0.47	0.50	0.48	0.49	0.50	0.52	0.52	0.51	0.50	0.52
Total Production	10.78	10.77	10.72	10.74	10.78	10.75	10.83	10.80	10.75	10.79	10.79	10.92	10.85
Imports (including SPR)													
Crude Oil	3.49	2.49	3.30	4.09	3.34	3.31	3.49	4.30	4.69	4.23	4.18	3.75	4.52
Refined Products	1.62	1.42	1.66	1.85	1.81	1.69	1.91	2.00	1.93	2.07	1.98	2.35	2.38
Total Imports	5.11	3.90	4.95	5.94	5.16	4.99	5.39	6.30	6.62	6.30	6.16	6.10	6.90
Exports													
Crude Oil	0.24	0.18	0.17	0.16	0.14	0.16	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Refined Products	0.58	0.70	0.64	0.47	0.49	0.57	0.53	0.54	0.54	0.53	0.54	0.55	0.57
Total Exports	0.82	0.88	0.81	0.64	0.63	0.74	0.71	0.73	0.73	0.72	0.72	0.74	0.75
Net Imports (incl SPR)	4.30	3.02	4.14	5.30	4.53	4.25	4.68	5.57	5.89	5.58	5.43	5.36	6.15
Primary Stock Levels[2] (million barrels)													
Opening	1253.31	1168.19	1063.61	1076.77	1131.15	1168.19	1074.01	1001.44	1032.02	1088.86	1074.01	1060.17	1017.73
Closing	1136.18	1063.61	1076.77	1131.15	1074.01	1074.01	1001.44	1032.02	1088.86	1060.17	1060.17	1017.73	1058.26
Net Withdrawals (million barrels per day)	0.32	1.16	-0.14	-0.59	0.62	0.26	0.80	-0.34	-0.62	0.31	0.04	0.47	-0.45
SPR Fill Rate Additions(-) (million barrels per day)	-0.17	-0.20	-0.23	-0.31	-0.20	-0.23	-0.18	-0.25	-0.12	-0.14	-0.17	-0.14	-0.14
Total Primary Supply	15.23	14.76	14.49	15.14	15.73	15.03	16.14	15.78	15.90	16.54	16.09	16.61	16.41
Product Supplied													
Motor Gasoline	6.54	6.29	6.68	6.81	6.69	6.62	6.48	6.86	7.00	6.76	6.78	6.39	6.76
Distillate Fuel Oil	2.67	2.83	2.52	2.43	2.95	2.68	3.26	2.82	2.48	3.18	2.93	3.38	3.10
Residual Fuel Oil	1.72	1.57	1.33	1.33	1.38	1.40	1.80	1.54	1.43	1.59	1.59	1.98	1.64
Other Products[3]	4.37	4.32	4.23	4.66	4.71	4.48	4.59	4.56	4.98	5.02	4.79	4.86	4.91
Total Product Supplied	15.30	15.01	14.76	15.22	15.73	15.18	16.14	15.78	15.90	16.54	16.09	16.61	16.41
Unaccounted for	-0.07	-0.26	-0.27	-0.09	0.00	-0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Disposition	15.23	14.76	14.49	15.14	15.73	15.03	16.14	15.78	15.90	16.54	16.09	16.61	16.41

SPR = Strategic Petroleum Reserve.
[1] Lower-48 States and southern Alaska.
[2] Excludes crude oil for the Strategic Petroleum Reserve (SPR). The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 32 million barrels to total petroleum stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)
[3] Includes Reclassified Petroleum Products.
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), and Petroleum Supply Monthly DOE/EIA-0109(83/12(3)).

Table 8. Quarterly Supply and Disposition of Petroleum: Low Economic Growth Case
(Million Barrels per Day, Except Stocks)

	History						Projections						
	1982	1983					1984					1985	
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Production													
Crude Oil	8.65	8.66	8.68	8.65	8.63	8.66	8.70	8.68	8.62	8.61	8.65	8.70	8.66
Alaska, North Slope	1.62	1.64	1.64	1.64	1.65	1.64	1.67	1.66	1.64	1.64	1.65	1.76	1.75
Subarctic[1]	7.03	7.01	7.04	7.02	6.98	7.01	7.03	7.02	6.98	6.97	7.00	6.93	6.91
Natural Gas Liquids	1.55	1.60	1.50	1.56	1.59	1.56	1.60	1.56	1.55	1.61	1.58	1.67	1.62
Other Domestic	0.05	0.05	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Processing Gain	0.53	0.47	0.48	0.47	0.50	0.48	0.49	0.52	0.52	0.49	0.50	0.46	0.49
Total Production	10.78	10.77	10.72	10.74	10.78	10.75	10.84	10.81	10.74	10.76	10.79	10.87	10.83
Imports (including SPR)													
Crude Oil	3.49	2.49	3.30	4.09	3.34	3.31	3.52	4.05	4.09	3.66	3.83	2.85	3.76
Refined Products	1.62	1.42	1.66	1.85	1.81	1.69	1.87	1.68	1.74	1.81	1.78	1.64	1.61
Total Imports	5.11	3.90	4.95	5.94	5.16	4.99	5.39	5.74	5.83	5.47	5.61	4.48	5.37
Exports													
Crude Oil	0.24	0.18	0.17	0.16	0.14	0.16	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Refined Products	0.58	0.70	0.64	0.47	0.49	0.57	0.53	0.54	0.54	0.53	0.54	0.55	0.57
Total Exports	0.82	0.88	0.81	0.64	0.63	0.74	0.71	0.73	0.73	0.72	0.72	0.74	0.75
Net Imports (incl SPR)	4.30	3.02	4.14	5.30	4.53	4.25	4.67	5.01	5.10	4.75	4.88	3.75	4.62
Primary Stock Levels[2]													
(million barrels)													
Opening	1253.31	1168.19	1063.61	1076.77	1131.15	1168.19	1074.01	1028.97	1066.22	1132.46	1074.01	1129.42	1061.95
Closing	1136.10	1063.61	1076.77	1131.15	1074.01	1074.01	1028.97	1066.22	1132.46	1129.42	1129.42	1061.95	1119.68
Net Withdrawals	0.32	1.16	-0.14	-0.59	0.62	0.26	0.49	-0.41	-0.72	0.03	-0.15	0.75	-0.63
(million barrels per day)													
SPR Fill Rate Additions(-)	-0.17	-0.20	-0.23	-0.31	-0.20	-0.23	-0.18	-0.25	-0.12	-0.14	-0.17	-0.14	-0.14
(million barrels per day)													
Total Primary Supply	15.23	14.76	14.49	15.14	15.73	15.03	15.83	15.16	15.00	15.40	15.35	15.22	14.67
Product Supplied													
Motor Gasoline	6.54	6.29	6.68	6.81	6.69	6.62	6.43	6.74	6.81	6.52	6.63	6.11	6.42
Distillate Fuel Oil	2.67	2.83	2.52	2.43	2.95	2.68	3.15	2.62	2.21	2.82	2.70	2.94	2.57
Residual Fuel Oil	1.72	1.57	1.33	1.33	1.38	1.40	1.70	1.39	1.25	1.36	1.42	1.68	1.29
Other Products[3]	4.37	4.32	4.23	4.66	4.71	4.48	4.55	4.41	4.72	4.70	4.60	4.48	4.39
Total Product Supplied	15.30	15.01	14.76	15.22	15.73	15.18	15.83	15.16	15.00	15.40	15.35	15.22	14.67
Unaccounted for	-0.07	-0.26	-0.27	-0.09	0.00	-0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Disposition	15.23	14.76	14.49	15.14	15.73	15.03	15.83	15.16	15.00	15.40	15.35	15.22	14.67

SPR = Strategic Petroleum Reserve.
[1]Lower-48 States and southern Alaska.
[2]Excludes crude oil for the Strategic Petroleum Reserve (SPR). The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 32 million barrels to total petroleum stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)
[3]Includes Reclassified Petroleum Products.
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), and Petroleum Supply Monthly DOE/EIA-0109(83/12(3)).

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Table 9. Petroleum Demand: Sensitivity Differentials
(Million Barrels per Day)

Sensitivities	1984					1985	
	1st	2nd	3rd	4th	Year	1st	2nd
Demand in 50 States							
Low Price	16.05	15.70	15.76	16.34	15.96	16.32	16.05
Base Case	15.92	15.43	15.45	16.02	15.70	16.02	15.71
High Price	15.82	15.29	15.23	15.75	15.52	15.66	15.26
Weather Sensitivity							
Adverse Weather	0.16	0.02	0.03	0.15	0.09	0.22	0.02
Favorable Weather	-0.28	-0.02	-0.03	-0.15	-0.12	-0.23	-0.02
Economic Sensitivity							
High Economic Activity ...	0.03	0.09	0.13	0.20	0.12	0.26	0.35
Low Economic Activity	-0.03	-0.11	-0.22	-0.31	-0.17	-0.43	-0.53
Combined Sensitivity Differentials[a] (excl. price)							
Upper Range	0.16	0.09	0.13	0.25	0.15	0.34	0.35
Lower Range	0.28	0.11	0.22	0.34	0.21	0.49	0.53
Range of Projected Demand							
High Demand[b]	16.21	15.79	15.89	16.59	16.11	16.66	16.40
Low Demand[c]	15.54	15.18	15.01	15.41	15.31	15.23	14.73

[a]The upper range of projected demand is calculated by adding the square root of the sum of the squared adverse weather and high economic sensitivity cases to the low price demand. The lower range of projected demand is calculated by subtracting from the high price demand the square root of the sum of the squared favorable weather and low economic sensitivities.
[b]Low Price demand plus the combined effects of adverse weather and high economic activity.
[c]High Price demand less the combined effects of favorable weather and low economic activity.

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Table 10. Petroleum Inventories[a]

Unit of Measure	End of 1979	End of 1980[b]	End of 1981	End of 1982[c]	Mid- 1983	Base Case Projections		
						End of 1983	Mid- 1984	End of 1984
Million Barrels	1,250	1,284	1,254	1,136	1,077	1,074	1,039	1,096
Days' Supply[d]	68.4	75.0	78.9	75.7	70.7	67.5	67.2	68.4

[a] Primary stocks (excluding Strategic Petroleum Reserve).
[b] Because of changes in EIA reporting in January 1981, inventory data since 1980 include approximately 34 million barrels of petroleum stocks (primarily Alaskan crude oil in transit by water) that was not counted before. (See Table 31 and Explanatory Notes, 1981 Petroleum Supply Annual DOE/EIA-340(81/1).)
[c] The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 32 million barrels to total petroleum stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the Petroleum Supply Monthly DOE/EIA-109(83/03).)
[d] Inventory level divided by the next quarter's figure for product supplied.

Note: Minor discrepancies with published EIA historial data are due to rounding.

Note: Due to the different basis for petroleum inventories, the pre-1981 days' supply measure is not comparable to subsequent days' supply measures. Using the old basis, the 1981 statistic would have been 76.9 days' supply. Due to the second revision of the reporting basis for petroleum inventories, pre-1983 days' supply measures are not comparable to subsequent days' supply measures. Using the 1981-82 basis, the end-of-1983 statistic would have been 66.8 days' supply.

Source: Historical data: Energy Information Administration, Petroleum Supply Monthly, DOE/EIA-0109-(83/12[3]).

Table 11. Quarterly Supply and Disposition of Motor Gasoline: Base Case
(Million Barrels per Day, Except Stocks)

	1982 Year	History 1983					Projections 1984					1985	
		1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Domestic Production[1]	6.34	5.92	6.41	6.61	6.37	6.33	6.32	6.49	6.69	6.64	6.53	6.18	6.40
Imports	0.20	0.17	0.27	0.28	0.27	0.25	0.22	0.20	0.20	0.20	0.20	0.20	0.20
Exports	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Net Imports	0.18	0.16	0.27	0.27	0.26	0.24	0.20	0.18	0.18	0.18	0.18	0.18	0.18
Primary Finished Stock Levels[2] (million barrels)													
Opening	203.47	202.54	183.71	183.32	189.68	202.54	185.49	191.79	180.48	176.66	185.49	192.10	200.57
Closing	194.50	183.71	183.32	189.68	185.49	185.49	191.79	180.48	176.66	192.10	192.10	200.57	196.41
Net Withdrawals (million barrels per day)	0.02	0.21	0.00	-0.07	0.05	0.05	-0.07	0.12	0.04	-0.17	-0.02	-0.09	0.05
Total Primary Supply	6.54	6.29	6.68	6.80	6.68	6.62	6.45	6.79	6.91	6.65	6.70	6.27	6.62
Disposition													
Leaded	3.13	2.88	3.07	3.05	2.89	2.97	2.70	2.78	2.74	2.56	2.70	2.33	2.38
Unleaded	3.41	3.41	3.62	3.75	3.79	3.65	3.75	4.01	4.17	4.09	4.01	3.94	4.24
Total Product Supplied	6.54	6.29	6.68	6.81	6.69	6.62	6.45	6.79	6.91	6.65	6.70	6.27	6.62
Unaccounted for	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Disposition	6.54	6.29	6.68	6.80	6.68	6.62	6.45	6.79	6.91	6.65	6.70	6.27	6.62

[1]Refinery production plus production at natural gas processing plants.
[2]Includes stocks at natural gas processing plants. Excludes stocks of reclassified motor gasoline blending components. The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 8 million barrels to total motor gasoline stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), and Petroleum Supply Monthly, DOE/EIA-0109(83/12(3)).

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Short-Term Energy Outlook Projections
Energy Information Administration

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

| | History | | | | | | Projections | | | | | | |
| | 1982 | 1983 | | | | | 1984 | | | | | 1985 | |
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Refinery Output	2.61	2.15	2.39	2.64	2.63	2.45	2.54	2.65	2.73	2.67	2.65	2.58	2.86
Imports	0.09	0.05	0.13	0.27	0.22	0.17	0.25	0.23	0.19	0.20	0.22	0.18	0.19
Exports	0.07	0.11	0.05	0.04	0.05	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Net Imports	0.02	-0.06	0.08	0.23	0.16	0.10	0.21	0.19	0.15	0.16	0.18	0.14	0.15
Primary Stock Levels[1] (million barrels)													
Opening	191.54	185.58	118.72	113.80	154.75	185.58	140.40	104.03	116.95	166.14	140.40	149.17	106.14
Closing	178.59	118.72	113.80	154.75	140.40	140.40	104.03	116.95	166.14	149.17	149.17	106.14	117.60
Net Withdrawals	0.04	0.74	0.05	-0.45	0.16	0.12	0.40	-0.14	-0.53	0.18	-0.02	0.48	-0.13
(million barrels per day)													
Total Primary Supply	2.66	2.83	2.52	2.43	2.95	2.68	3.16	2.70	2.35	3.01	2.80	3.20	2.88
Product Supplied													
Nonutility Shipments	2.64	2.80	2.51	2.39	2.90	2.65	3.10	2.64	2.31	2.98	2.76	3.14	2.81
Electric Utility Shipments	0.03	0.03	0.01	0.04	0.05	0.03	0.06	0.06	0.03	0.03	0.05	0.05	0.08
Total Product Supplied	2.67	2.83	2.52	2.43	2.95	2.68	3.16	2.70	2.35	3.01	2.80	3.20	2.88
Electric Utility Consumption	0.04	0.03	0.03	0.05	0.07	0.05	0.05	0.04	0.05	0.05	0.05	0.06	0.04
Electric Utility Stock Levels (million barrels)													
Opening	26.09	23.37	23.20	21.43	20.69	23.37	18.81	19.63	20.96	19.87	18.81	18.64	18.43
Closing	23.37	23.20	21.43	20.69	18.81	18.81	19.63	20.96	19.87	18.64	18.64	18.64	21.47
Net Additions	-0.01	-0.00	-0.02	-0.01	-0.02	-0.01	0.01	0.01	-0.01	-0.01	-0.00	-0.00	0.03
(million barrels per day)													
Electric Utility Discrepancy	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00
Unaccounted for	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00
Total Disposition	2.66	2.83	2.52	2.43	2.95	2.68	3.16	2.70	2.35	3.01	2.80	3.20	2.88

[1]The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 7 million barrels to total distillate fuel oil stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)

Note: Minor discrepancies with other EIA published historical data are due to rounding.

Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), the Petroleum Supply Monthly DOE/EIA-0109(83/12(3)), the Monthly Energy Review DOE/EIA-0035(83/12(3)), the Electric Power Monthly DOE/EIA-0226(83/12).

Table 13. Quarterly Supply and Disposition of Residual Fuel Oil: Base Case
(Million Barrels per Day, Except Stocks)

| | History | | | | | | Projections | | | | | | |
	1982 Year	1983 1st	1983 2nd	1983 3rd	1983 4th	1983 Year	1984 1st	1984 2nd	1984 3rd	1984 4th	1984 Year	1985 1st	1985 2nd
Supply													
Refinery Output	1.07	0.88	0.90	0.76	0.85	0.85	1.01	0.93	0.84	1.02	0.95	1.11	0.96
Imports	0.78	0.67	0.71	0.69	0.68	0.69	0.79	0.74	0.72	0.68	0.73	0.74	0.74
Exports	0.21	0.22	0.24	0.13	0.15	0.18	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Net Imports	0.57	0.45	0.47	0.56	0.53	0.50	0.64	0.59	0.57	0.53	0.58	0.59	0.59
Primary Stock Levels[1] (million barrels)													
Opening	77.99	68.23	46.31	50.08	49.69	68.23	49.11	41.06	46.51	51.72	49.11	56.54	41.74
Closing	66.20	46.31	50.08	49.69	49.11	49.11	41.06	46.51	51.72	56.54	56.54	41.74	44.87
Net Withdrawals (million barrels per day)	0.03	0.24	-0.04	0.00	0.01	0.05	0.09	-0.06	-0.06	-0.05	-0.02	0.16	-0.03
Total Primary Supply	1.67	1.57	1.33	1.33	1.38	1.40	1.74	1.46	1.35	1.49	1.51	1.87	1.51
Product Supplied													
Nonutility Shipments	1.09	1.04	0.81	0.69	0.84	0.85	1.02	0.81	0.72	0.92	0.87	1.05	0.85
Electric Utility Shipments	0.62	0.53	0.52	0.64	0.54	0.56	0.72	0.65	0.63	0.57	0.64	0.81	0.67
Total Product Supplied	1.72	1.57	1.33	1.33	1.38	1.40	1.74	1.46	1.35	1.49	1.51	1.87	1.51
Electric Utility Consumption	0.64	0.68	0.53	0.70	0.59	0.63	0.79	0.62	0.65	0.63	0.67	0.83	0.61
Electric Utility Stock Levels (million barrels)													
Opening	102.04	95.51	81.63	80.09	74.56	95.51	70.56	63.87	66.92	65.03	70.56	60.02	58.34
Closing	95.51	81.63	80.09	74.56	70.56	70.56	63.87	66.92	65.03	60.02	60.02	58.34	63.47
Net Additions (million barrels per day)	-0.02	-0.15	-0.02	-0.06	-0.04	-0.07	-0.07	0.03	-0.02	-0.05	-0.03	-0.02	0.06
Electric Utility Discrepancy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unaccounted for	-0.05	-0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Total Disposition	1.67	1.57	1.33	1.33	1.38	1.40	1.74	1.46	1.35	1.49	1.51	1.87	1.51

[1]The respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 2 million barrels to total residual fuel oil stocks at the close of December 31, 1982. (See the Petroleum Supply Reporting System Overview and Table 30 in the March 1983 Petroleum Supply Monthly.)

Note: Minor discrepancies with other EIA published historical data are due to rounding.

Sources: Historical data: Energy Information Administration, 1982 Petroleum Supply Annual DOE/EIA-340(83/06), the Petroleum Supply Monthly DOE/EIA-0109(83/12)(3), the Monthly Energy Review DOE/EIA-0035(83/12)(3), the Electric Power Monthly DOE/EIA-0226(83/12).

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

	History						Projections						
	1982	1983					1984					1985	
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Total Dry Gas Production[1]	17.76	4.07	3.72	3.90	4.20	15.90	4.31	4.18	4.20	4.35	17.03	4.41	4.37
Net Imports of Dry Gas	0.88	0.27	0.16	0.15	0.22	0.80	0.26	0.19	0.19	0.25	0.88	0.27	0.19
Net Imports of LNG	0.01	0.03	0.02	0.01	0.02	0.08	-0.00	-0.00	-0.00	-0.00	-0.02	-0.00	-0.00
SNG Production	0.12	0.03	0.02	0.02	0.03	0.10	0.04	0.02	0.02	0.03	0.12	0.04	0.02
Total New Supply	18.76	4.40	3.93	4.08	4.47	16.88	4.60	4.40	4.39	4.62	18.02	4.71	4.58
Underground Storage													
Opening	6.57	6.88	5.96	6.27	6.96	6.88	6.44	5.28	5.92	6.88	6.44	6.46	5.35
Closing	6.88	5.96	6.27	6.96	6.44	6.44	5.28	5.92	6.88	6.46	6.46	5.35	6.10
Net Withdrawals	-0.31	0.92	-0.31	-0.69	0.52	0.44	1.16	-0.64	-0.96	0.42	-0.02	1.11	-0.75
Total Primary Supply[1]	18.45	5.32	3.62	3.39	4.99	17.32	5.76	3.76	3.43	5.04	18.00	5.82	3.83
Consumption													
Electric Utilities	3.23	0.59	0.67	0.97	0.68	2.91	0.60	0.75	0.95	0.68	2.98	0.59	0.72
Refinery Fuel	0.59	0.14	0.16	0.16	0.16	0.62	0.16	0.17	0.17	0.17	0.67	0.16	0.17
All Other Uses[2]	14.20	4.49	2.71	2.17	4.04	13.41	4.92	2.77	2.25	4.11	14.06	4.98	2.87
Subtotal	18.01	5.23	3.54	3.30	4.88	16.95	5.68	3.69	3.37	4.96	17.71	5.13	3.76
Unaccounted for	0.44	0.09	0.08	0.09	0.11	0.37	0.08	0.07	0.06	0.08	0.29	0.09	0.07
Total Disposition	18.45	5.32	3.62	3.39	4.99	17.32	5.76	3.76	3.43	5.04	18.00	5.82	3.83

LNG=Liquefied Natural Gas.
SNG=Synthetic Natural Gas.
[1]Excludes nonhydrocarbon gases removed.
[2]Includes residential, commercial, and industrial uses plus use of synthetic natural gas.
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/12(3))),
Natural Gas Monthly DOE/EIA-0130(83/12), and Electric Power Monthly DOE/EIA-0226(83/12).

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

| | History | | | | | | Projections | | | | | | |
| | 1982 | 1983 | | | | | 1984 | | | | | 1985 | |
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Production	838.	191.[2]	186.[2]	198.[2]	210.[2]	785.[2]	200.	208.	227.	217.	853.	219.	230.
Primary Stock Levels[1]													
Opening	24.	37.	39.	37.	35.	37.	37.	32.	30.	25.	37.	24.	24.
Closing	37.	39.	37.	35.	37.[2]	37.[2]	32.	30.	25.	24.	24.	24.	24.
Net Withdrawals	-13.	-2.	2.	3.	-3.	-1.	5.	2.	5.	1.	13.	0.	0.
Imports	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
Exports	106.	15.	20.	22.	20.	78.	17.	20.	21.	21.	79.	18.	22.
Total New Domestic Supply	720.	174.[2]	168.[2]	179.[2]	187.[2]	708.[2]	189.	190.	213.	198.	789.	201.	209.
Secondary Stock Levels[3]													
Opening	185.	195.	192.	197.	174.	195.	171.	163.	169.	175.	171.	176.	169.
Closing	195.	192.	197.	174.	171.[2]	171.[2]	163.	169.	175.	176.	176.	169.	182.
Net Withdrawals	-10.	4.	-6.	23.	3.[2]	24.[2]	8.	-6.	-6.	-1.	-5.	7.	-12.
Total Indicated Consumption	710.	177.[2]	162.[2]	202.[2]	190.[2]	732.[2]	197.	185.	206.	196.	784.	208.	196.
Domestic Consumption													
Coke Plants	41.	8.	9.	10.	12.[2]	39.[2]	12.	12.	11.	11.	46.	12.	12.
Electric Utilities	594.	146.	140.	179.	161.[2]	626.[2]	165.	155.	178.	165.	663.	175.	167.
Retail and General Industry	72.	19.	17.	19.	19.[2]	73.[2]	20.	17.	17.	20.	75.	20.	18.
Total Domestic Consumption	707.	173.	165.	207.	192.[2]	737.[2]	197.	185.	206.	196.	784.	208.	196.
Discrepancy[4]	3.	4.[2]	-3.[2]	-5.[2]	-2.[2]	-5.[2]	0.	-0.	0.	-0.	0.	0.	0.

[1]Primary stocks are those held at the mines, preparation plants, and distribution points.
[2]Estimated.
[3]Secondary stocks are those held by users. Most of the secondary stocks are held by electric utilities.
[4]Historical period discrepancy reflects unaccounted for shipper and receiver reporting discrepancies.
Note: Rows and columns may not add due to independent rounding. Zeros indicate amounts of less than 500,000 tons.
Sources: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/12(3)),
Quarterly Coal Report DOE/EIA-0121(83/3Q).

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Table 16. Quarterly Supply and Disposition of Electricity
(Billion Kilowatt-Hours)

| | History | | | | | | Projections | | | | | | |
| | 1982 | 1983 | | | | | 1984 | | | | | 1985 | |
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Generation													
Coal	1192.00	296.45	280.92	359.81	322.31	1259.50	332.22	312.36	356.07	328.89	1329.54	352.00	334.62
Petroleum	146.80	38.02	30.52	40.80	35.20	144.55	44.65	35.18	37.24	36.08	153.15	46.53	34.57
Natural Gas	305.26	56.06	62.71	90.79	64.52	274.09	56.08	70.35	89.70	63.83	279.96	55.51	67.87
Nuclear	282.77	71.19	68.57	76.01	76.27	292.05	73.81	70.29	86.82	87.57	318.49	85.21	80.65
Hydroelectric	309.21	87.57	91.87	75.57	77.09	332.11	91.13	89.52	70.50	68.04	319.19	74.43	77.72
Geothermal and Other[1]	5.16	1.36	1.24	1.98	1.88	6.46	1.63	1.59	1.85	1.81	6.90	1.82	1.71
Total Generation	2241.21	550.66	535.84	644.97	577.28	2308.74	599.53	579.29	642.18	586.22	2407.22	615.50	597.14
Net Imports	31.67	7.80	7.89	7.99	7.99	31.67	6.15	6.24	6.29	6.29	24.97	6.15	6.24
Total Supply	2272.88	558.46	543.73	652.96	585.27	2340.41	605.68	585.54	648.47	592.51	2432.20	621.65	603.39
T & D Loss[2]	187.80	37.98	49.51	51.09	41.10	179.68	46.32	45.06	49.32	45.57	186.26	47.39	46.25
Total Consumption (sales)	2085.07	520.48	494.22	601.87	544.17	2160.73	559.36	540.48	599.15	546.94	2245.94	574.26	557.13

[1]Includes wood and waste.
[2]Transmission and distribution losses through the power network, calculated as total supply minus total sales.
Note: Minor discrepancies with other EIA published historical data are due to rounding.
Source: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/12(3)),
and Electric Power Monthly DOE/EIA-0226(83/12).

Table 17. Quarterly Supply and Disposition of Total Energy
(Quadrillion Btu)

	1982	History 1983					Projections 1984					1985	
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply													
Production													
Petroleum[1]	20.53	5.08	5.12	5.18	5.18	20.57	5.16	5.14	5.16	5.17	20.64	5.13	5.15
Natural Gas[2]	18.02	4.13	3.78	3.96	4.26	16.13	4.37	4.25	4.25	4.41	17.29	4.48	4.43
Coal	16.76	4.28	4.16	4.43	4.69	17.57	4.48	4.66	5.09	4.86	19.10	4.89	5.16
Nuclear	3.08	0.78	0.75	0.83	0.83	3.19	0.81	0.77	0.95	0.96	3.47	0.93	0.88
Hydroelectric[3]	3.25	0.92	0.96	0.79	0.81	3.49	0.96	0.94	0.76	0.72	3.35	0.78	0.82
Geothermal and Other[4]	0.11	0.03	0.03	0.04	0.04	0.14	0.04	0.03	0.04	0.04	0.15	0.04	0.04
Subtotal	63.76	15.22	14.80	15.24	15.81	61.07	15.82	15.79	16.23	16.16	64.00	16.25	16.47
Net Imports													
Crude Oil	6.90	1.21	1.65	2.10	1.71	6.67	1.72	2.10	2.31	2.11	8.23	1.77	2.27
Other Petroleum	2.12	0.35	0.51	0.71	0.68	2.25	0.70	0.57	0.62	0.68	2.57	0.63	0.56
Natural Gas (Dry)	0.89	0.27	0.15	0.16	0.22	0.79	0.26	0.20	0.19	0.25	0.90	0.27	0.20
Liquefied Natural Gas	0.01	0.03	0.02	0.01	0.02	0.09	-0.00	-0.00	-0.00	-0.00	-0.02	-0.00	-0.00
Coal and Coke	-2.79	-0.39	-0.53	-0.57	-0.52	-2.02	-0.43	-0.52	-0.53	-0.54	-2.01	-0.46	-0.56
Electricity	0.33	0.08	0.08	0.08	0.08	0.33	0.06	0.06	0.07	0.07	0.26	0.06	0.06
Subtotal	7.46	1.55	1.89	2.49	2.19	8.12	2.30	2.41	2.65	2.57	9.93	2.27	2.53
Primary Stocks													
Net Withdrawals	-0.06	1.45	-0.31	-0.94	0.75	0.96	1.59	-0.73	-1.21	0.51	0.16	1.46	-0.98
SPR Fill Rate Additions(-)	-0.37	-0.10	-0.12	-0.17	-0.10	-0.49	-0.09	-0.13	-0.07	-0.08	-0.37	-0.08	-0.08
Secondary Stocks[5]													
Net Withdrawals	-0.15	0.18	-0.10	0.53	0.08	0.69	0.21	-0.14	-0.12	0.01	-0.05	0.17	-0.31
Total Supply[6]	70.65	18.29	16.16	17.17	18.73	70.34	19.82	17.20	17.48	19.17	73.68	20.07	17.64
Consumption													
Nonutility Uses													
Petroleum[7]	28.85	6.96	6.99	7.19	7.50	28.64	7.41	7.27	7.34	7.64	29.66	7.35	7.42
Natural Gas[7]	15.16	4.75	2.94	2.39	4.30	14.39	5.21	3.01	2.48	4.39	15.10	5.27	3.12
Coal	2.87	0.69	0.66	0.73	0.69	2.76	0.80	0.75	0.76	0.83	3.14	0.83	0.78
Subtotal	46.87	12.40	10.58	10.31	12.48	45.79	13.42	11.03	10.58	12.86	47.90	13.45	11.32
Electric Utility Inputs													
Petroleum	1.57	0.40	0.33	0.44	0.38	1.55	0.48	0.38	0.40	0.39	1.65	0.50	0.37
Natural Gas	3.34	0.61	0.69	1.00	0.71	3.01	0.62	0.77	0.99	0.70	3.06	0.61	0.75
Coal	12.52	3.08	2.94	3.77	3.40	13.19	3.49	3.28	3.74	3.46	13.97	3.70	3.52
Nuclear	3.08	0.78	0.75	0.83	0.83	3.19	0.81	0.77	0.95	0.96	3.47	0.93	0.88
Hydroelectric[8]	3.57	1.00	1.05	0.88	0.89	3.82	1.02	1.00	0.81	0.78	3.61	0.93	0.88
Geothermal and Other	0.11	0.03	0.03	0.04	0.04	0.14	0.04	0.03	0.04	0.04	0.15	0.04	0.04
Subtotal	24.19	5.91	5.78	6.95	6.25	24.89	6.45	6.24	6.92	6.32	25.93	6.63	6.43
Gross Energy Consumption[6]	71.06	18.31	16.36	17.26	18.74	70.68	19.87	17.27	17.50	19.18	73.83	20.08	17.75
Electric Utility Adjustments													
Conversion Loss[9]	17.07	4.13	4.09	4.89	4.39	17.50	4.54	4.39	4.88	4.45	18.26	4.66	4.53
Total Net Energy	53.99	14.18	12.27	12.37	14.35	53.18	15.33	12.88	12.62	14.73	55.57	15.42	13.22
Unaccounted for	-0.41	-0.02	-0.20	-0.09	-0.01	-0.34	-0.05	-0.07	-0.02	-0.01	-0.15	-0.01	-0.11
Total Disposition	70.65	18.29	16.16	17.17	18.73	70.34	19.82	17.20	17.48	19.17	73.68	20.07	17.64

SPR = Strategic Petroleum Reserve.
[1] Includes crude oil and lease condensate; natural gas liquids; hydrogen, etc., input to oil refineries.
[2] Total dry gas production excluding nonhydrocarbon gases removed.
[3] Includes industrial production.
[4] Includes wood and waste used to generate electricity.
[5] Primarily electric utility stocks.
[6] This total excludes approximately 2 quadrillion Btu of wood.
[7] Includes natural gas used as refinery fuel.
[8] Includes industrial hydroelectric production and net imports of electricity.
[9] Includes plant use and T & D losses.
Note: The conversion from physical units to Btu is calculated by STIFS using a subset of Monthly Energy Review conversion factors. Consequently, the historical data will not precisely match that published in the Monthly Energy Review. In addition, minor discrepancies with EIA published historical data are due to rounding.
Source: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/12)(13)), and Electric Power Monthly DOE/EIA-0226(83/12).
See note above.

Forecast Conversion Factors Used in STIFS

Most of the conversion factors used by the Short-Term Integrated Forecasting System (STIFS) are the 1982-83 EIA standard conversion factors (found on the last page of the Monthly Energy Review). Special factors used in STIFS are derived from data in the Monthly Energy Review or from energy data reports such as the Petroleum Supply Monthly.

Product Identification	Unit	Btu/Unit
A. Thermal Content of Fuels and Energy		
Crude Oil Production	barrel	5,800,000
Crude Oil Import	"	5,818,000
Unfinished Oils	"	5,825,000
Total Petroleum Consumed	"	5,448,000
Total Petroleum Imports	"	5,775,000
Total Petroleum Exports	"	5,821,000
Motor Gasoline	"	5,253,000
Jet Fuel	"	5,615,000
Distillate Fuel Oil	"	5,825,000
Refinery Fuel (Liquids)	"	5,850,000
All Refinery Inputs	"	5,773,000
Residual Fuel Oil	"	6,287,000
LPG's and LRG's	"	3,643,000
Ethane	"	3,082,000
Hydrogen, etc. to Refineries	"	3,500,000
Natural Gas Liquids (Production)	"	3,930,000
Natural Gas Consumption (dry)	cubic foot	1,027
Natural Gas Imports	"	1,014
Natural Gas Exports	"	1,011
Synthetic Gas Production	"	1,000
Natural Gas Refinery Fuel	"	1,021
Bituminous Coal & Lignite Consumed	short ton	21,800,000
Coal to Electric Utilities	"	21,090,000
Coal Consumption, Excl. Utilities	"	24,960,000
Bituminous Coal and Lignite Prod.	"	22,380,000
Coking Coal	"	24,960,000
General Ind. and Retail Coal	"	24,960,000
Coke	"	26,000,000
Bituminous Coal and Lignite Exports	"	26,180,000
Bituminous Coal and Lignite Imports	"	25,000,000

B. Efficiency of Conversion Processes

1. Electric Power Generation

Fuel or Power Source:	Btu/KWh (heat rate)
Coal	10,506
Crude Oil	10,724
Distillate Fuel Oil	13,501
Residual Fuel Oil	10,649
Geothermal and Other Energy	21,594
Nuclear Energy	10,908
Natural Gas	10,927
Hydropower	10,388

2. Other Conversion Processes

	Btu Out/Btu In
Coke	0.68
Synthetic Gas	0.95

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