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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 the 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 1984.

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 in cases where EIA projections of the world price of crude oil 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 the level of price, weather, and economic activity are shown in Table 10.

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

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1. Highlights

Domestic petroleum consumption in 1984 is expected to average 15.9 million barrels per day, a 4.7-percent increase over expected 1983 demand of 15.2 million barrels per day. Petroleum demand in 1984 is expected to show an increase, on an annual basis, for the first time since 1978. Compared to the August 1983 Outlook forecast, projected demand in 1984 is down slightly, despite a somewhat higher forecast for industrial production. This downward revision primarily reflects weaker petroleum demand in the industrial sector than forecasted previously, but it also reflects a slightly lower real disposable personal income and a slightly higher world oil price. Data for the second and third quarters of 1983 show a stronger and faster economic recovery than previously forecast; as a result, manufacturing activity is now projected to rise by 8 percent between 1982 and 1983 and by an additional 10 percent between 1983 and 1984. Although the assumed world oil price of \$29.40 per barrel in 1984 is slightly higher than forecast previously, oil prices are still expected to remain stable at that level (in nominal terms) throughout the forecast period.

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 for the current forecast, the projected 1984 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, the 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 historic downward trend.

Even though total petroleum demand in 1984 is projected to exceed the 1983 level, the 1984 projection is still 1 percent below the 1981 level of 16.06 million barrels per day. The 1984 forecast is below 1981 demand despite projected 1984 industrial output (the key variable driving industrial demand for petroleum) almost 9 percent above 1981 output, and projected world oil prices, adjusted for inflation, more than 30 percent below 1981 average prices. If industrial output were to increase at the same rate as GNP (5.5 percent) between 1983 and 1984 rather than at the 10.0 percent now assumed, it is estimated that total petroleum demand would be over 0.3 million barrels per day less than the base case forecast, or about 15.6 million barrels per day.

U.S. energy needs are expected to be met by a higher level of oil imports in the short term, as domestic lower-48 crude oil production resumes its decline. Likewise, demand for oil imports in other major consuming countries is projected to strengthen, because of increased domestic demand and a reversal of the drawdown of petroleum inventories that occurred over the past 2 years. Two important assumptions underlying the forecast for oil imports are the expected inability of OPEC members to adhere to stated production quotas and the continued pressure to keep crude oil prices at current levels.

World oil consumption is projected to increase in 1984 for the first time since 1979. Moreover, the worldwide demand for oil is expected to be comfortably met by current production with no appreciable rise in the world oil price during 1984. The increase in economic growth that is underway in the industrial nations is expected to continue, thus increasing demand for petroleum throughout 1984. Also, an increase in demand in the developing countries is expected. Between 1983 and 1984, worldwide demand for petroleum is projected to increase by about 3 percent.

The principal forecasts from the base case scenario are highlighted below:

- Total U.S. petroleum consumption in 1983 is projected to be 15.2 million barrels per day, about the same level as in 1982. As the economic recovery continues into 1984, petroleum consumption is projected to be about 15.9 million barrels per day, approximately 5 percent above year-earlier levels. (The base case projection for petroleum is summarized in Table 1.)
 - Motor gasoline consumption is projected to rise slightly from 1982 to 1983, to 6.6 million barrels per day, and then rise to 6.7 million barrels per day in 1984.
 - Distillate fuel oil consumption is projected to rise slightly in 1983, to 2.7 million barrels per day. A 7-percent increase in distillate consumption, to 2.9 million barrels per day, is projected for 1984.
 - Residual fuel oil consumption is projected to average 1.4 million barrels per day in 1983 (about 16 percent below 1982 consumption), and then rise to slightly under the 1982 level in 1984.
- Net 1983 oil imports, at 4.4 million barrels per day, are projected to be approximately equal to the 1982 level. A 26-percent year-to-year rise in net imports, to about 5.5 million barrels per day, is projected for 1984.
 - Total 1983 oil imports, measured on a balance-of-payments' basis, are forecast to cost \$50 billion, about 20 percent less than in 1982, primarily because of lower crude oil prices. The total cost of oil imports in 1984 is projected to rise about 20 percent, to \$60 billion.
- Natural gas consumption in 1983 is projected to be 16.6 trillion cubic feet--about 7 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 3 percent above year-earlier levels.

A 10-percent decline in gas production, to 15.7 trillion cubic feet, is projected for 1983, with 1984 production at 16.8 trillion cubic feet, up about 7 percent from 1983. Gas prices to residential users in 1983 are forecast to average 18 percent above year-earlier levels, and then to rise by about 9 percent from 1983 to 1984.

- Domestic coal consumption is forecast to rise by 4 percent from 1982 to 1983, and then to rise by about 7 percent in 1984, to 779 million tons. Coal exports are projected to drop by 26 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. Because of a sharp decline in exports, significant withdrawals from domestic inventories, and weak growth in domestic consumption, U.S. coal production is forecast to fall by more than 6 percent, to 787 million tons, in 1983. In 1984, all categories of coal consumption, together with exports, are expected to increase, leading to record-high coal production of 840 million tons, almost 7 percent above the year-earlier level.
- Electric power generation is projected to rise by about 2 percent from 1982 to 1983, to 2,293 billion kilowatt-hours. As a result of the projected healthy growth in the economy, especially in the industrial sector, a 3.6-percent year-to-year rise in electricity generation, to 2,377 billion kilowatt-hours, is projected for 1984.

- Increases from 1982 to 1983 are projected for generation from coal, nuclear power, and hydroelectric power, while petroleum and natural gas-fired generation are forecast to decline.

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 278 billion kilowatt-hours per year since 1973, is projected to be 325 billion kilowatt-hours in 1983, a record of almost 17 percent above the average level. The 1984 projection reflects a return to near normal levels of hydroelectric generation.

- Total U.S. energy consumption in 1983 is projected to be 70.1 quadrillion Btu in 1983, and then to rise by over 4 percent, to 73.0 quadrillion Btu, in 1984 (see Table 2).
- The share of total energy consumption accounted for by petroleum is projected to remain at approximately 43 percent during 1983 and 1984, while the coal share is forecast to rise steadily, to 23 percent in 1984. The natural gas share is forecast to be about 24 percent of total energy consumption throughout the forecast period.
- The energy intensity of U.S. economic activity is projected to decline to 45.8 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 Btu/real GNP ratio is forecast.

Table 2. Gross Energy Consumption by Source
(Quadrillion Btu)

	History				Projections	
	1979	1980	1981	1982	1983	1984
Petroleum	37.1	34.2	31.9	30.4	30.2	31.7
Natural Gas	20.7	20.4	19.9	18.3	17.1	17.6
Coal ^a	15.2	15.4	16.0	15.4	15.9	16.9
Nuclear Power .. ^b	2.7	2.7	3.0	3.1	3.2	3.4
Hydroelectricity ^b	3.1	3.1	3.1	3.6	3.7	3.3
Geothermal and Other	0.1	0.1	0.1	0.1	0.1	0.2
Gross Energy Use ^c	78.9	76.0	74.0	70.9	70.1	73.0

^aIncludes net imports of coal coke.

^bIncludes net imports of electricity plus industrial production of electricity.

^cThe total may not equal the sum of the components shown due to independent rounding.

Sources: Historical data: Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(83/11), and Electric Power Monthly, DOE/EIA-0226(83/09).

It should be noted that the forecast given above is this Outlook's base case forecast. Additional cases for petroleum, based on alternative economic growth rates and oil prices, are included in the report. 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 200,000 barrels per day (approximately 1.3 percent and 3.2 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 180,000 barrels per day (approximately 0.5 percent and 1.3 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 3.1 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 140,000 barrels per day (approximately 0.3 percent and 0.6 percent, respectively).

2. The Outlook

Forecast Assumptions

World Oil Prices

The price of crude oil delivered to U.S. refineries is assumed to stabilize at its estimated October 1983 level of about \$29.40 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 nominal price of crude oil is assumed to be level through 1984 because:

- World economic growth is projected to resume during 1983 and 1984 with the result that oil consumption increases from recent levels, bolstering prices that are currently facing downward pressure because of excess supply.
- An end to the apparent large drawdowns of petroleum inventories in the importing countries during the last 2 years is projected during 1983, contributing to the increased demand for oil on the world market.
- Recent attempts at restraining 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 demands.

The three alternative forecast cases presented in this Outlook incorporate differing price and economic growth 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: | The average price of crude oil to U.S. refiners is assumed to fall to \$25 per barrel at the beginning of 1984, and then to remain level for the remainder of the forecast period. |
| Base Case: | Prices are assumed to remain constant at the estimated October level of about \$29.40 per barrel. |
| Low Economic Growth: | Due to increased tension and concerns about the availability of future supply in the oil market, prices are assumed to rise at 2 times the U.S. rate of inflation and to average nearly \$33 per barrel by the fourth quarter of 1984. |

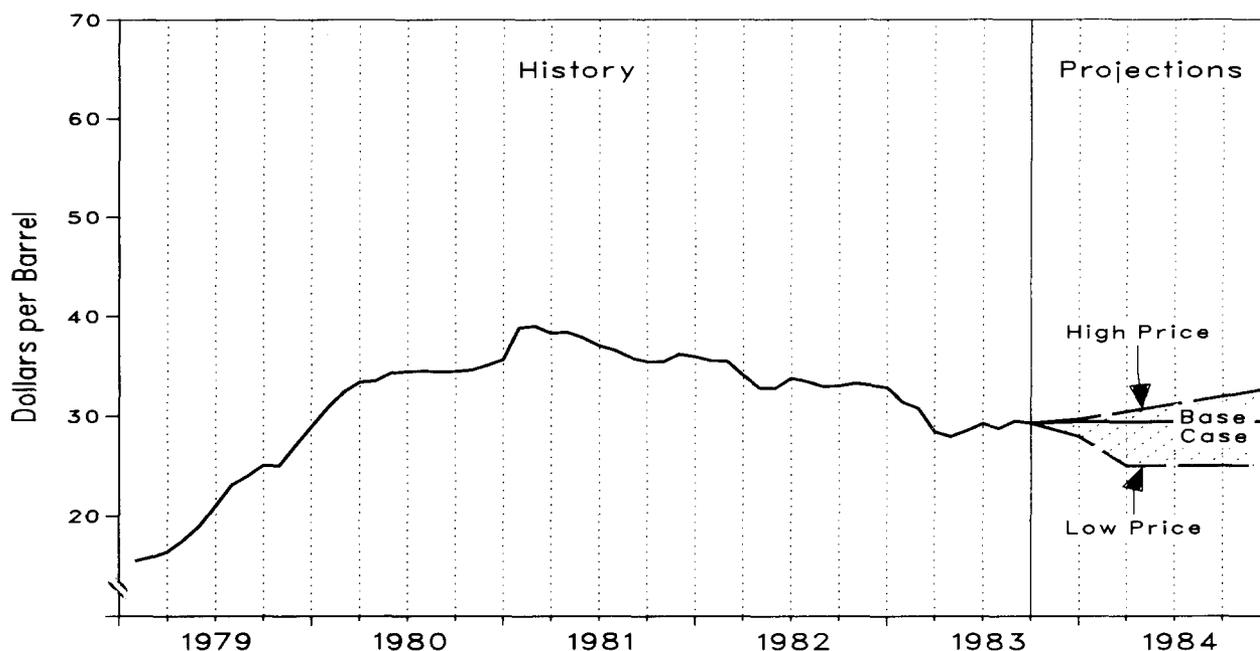


Figure 1. Imported Crude Oil Prices

The assumptions used to generate the high and low projections are designed to produce the widest possible 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 GNP is projected to rise by 3.4 percent from 1982 to 1983 and by 5.5 percent from 1983 to 1984. This projection is based on the Data Resources, Incorporated, (DRI) CONTROL forecast of October 1983, as modified by the base case projection of the world oil price. Real Disposable Personal Income (RDPI) is projected to increase less rapidly than GNP, mainly because this measure of economic activity historically has been less affected by cyclical fluctuations. Lower-than-expected growth in disposable income between the second and third quarters of 1983 contributed to a slight downward revision in the forecast levels through 1984 from the August 1983 Outlook. Manufacturing activity, which declined by 8.5 percent from 1981 to 1982, is forecast to increase by 8.1 percent between 1982 and 1983 and by 10.0 percent between 1983 and 1984. This forecast of manufacturing activity is higher than the projection published in the August 1983 Outlook, based on a very strong showing in the third quarter of 1983. Inflation, as measured by the GNP implicit price deflator, was 6.0 percent between 1981 and 1982. Inflation is projected to be 4.3 percent from 1982 to 1983 and 5.1 percent between 1983 and 1984. (Assumptions pertaining to price, the economy, and weather are shown in Table 3.)

Table 3. Macroeconomic, Price, and Weather Data Assumptions for Low, Base, and High Price Cases

Assumptions	History									Projections										
	1980 Year	1981 Year	1982			1983			Economic Growth	1983		1984								
			1st	2nd	3rd	4th	Year	1st	2nd	3rd		4th	Year	1st	2nd	3rd	4th	Year		
(billion 1972 dollars)																				
Macroeconomic											High	1,577	1,537	1,600	1,622	1,642	1,659	1,631		
Real Gross National Product ^a	1,475	1,514	1,486	1,489	1,486	1,481	1,485	1,490	1,525	1,554	Base	1,575	1,536	1,594	1,613	1,630	1,643	1,620		
											Low	1,575	1,536	1,593	1,611	1,627	1,639	1,618		
Percent Change from Prior Year	-0.3	2.6	-1.6	-1.5	-2.6	-1.7	-1.9	0.3	2.4	4.6	High	6.5	3.5	7.4	6.4	5.7	5.2	6.1		
											Base	6.3	3.4	7.0	5.8	4.9	4.3	5.5		
											Low	6.3	3.4	6.9	5.6	4.7	4.1	5.3		
GNP Implicit Price Deflator (Index, 1972=100)	178.4	195.1	203.4	206.1	208.0	210.0	206.9	212.8	214.6	216.4	High	219.3	215.8	221.9	224.1	226.2	228.4	225.2		
											Base	219.3	215.8	222.4	225.3	228.1	230.9	226.7		
											Low	219.3	215.8	222.4	225.5	228.4	231.6	227.0		
Percent Change from Prior Year	9.2	9.4	7.1	7.1	5.6	4.4	6.0	4.6	4.1	4.0	High	4.4	4.3	4.3	4.4	4.5	4.2	4.4		
											Base	4.4	4.3	4.5	5.0	5.4	5.3	5.0		
											Low	4.4	4.3	4.5	5.1	5.6	5.6	5.2		
Real Disposable Personal Income ^b	1,022	1,055	1,055	1,060	1,059	1,066	1,060	1,074	1,083	1,101	High	1,115	1,093	1,130	1,139	1,150	1,160	1,145		
											Base	1,115	1,093	1,128	1,137	1,146	1,155	1,141		
											Low	1,115	1,093	1,128	1,136	1,145	1,153	1,141		
Percent Change from Prior Year	0.6	3.2	1.4	1.4	-0.8	0.2	0.5	1.8	2.2	3.9	High	4.6	3.1	5.2	5.2	4.5	4.0	4.8		
											Base	4.6	3.1	5.0	5.0	4.1	3.6	4.4		
											Low	4.6	3.1	5.0	4.9	4.0	3.4	4.4		
Index of Industrial Production (MFG) (Index, 1967=100)	146.7	150.3	139.8	138.1	137.7	134.5	137.5	138.4	145.2	152.6	High	158.7	148.7	162.4	164.6	167.3	169.9	166.1		
											Base	158.2	148.6	161.0	162.5	164.3	166.0	163.5		
											Low	158.2	148.6	160.8	162.0	163.5	164.8	162.8		
Percent Change from Prior Year	-4.5	2.4	-7.6	-9.4	-5.7	-7.2	-8.5	-1.0	5.1	10.8	High	18.0	8.1	17.3	13.4	9.6	7.1	11.7		
											Base	17.6	8.1	16.3	11.9	7.7	4.9	10.0		
											Low	17.6	8.1	16.2	11.6	7.1	4.2	9.6		
(U.S. nominal dollars/barrel)																				
Oil Price											High	27.93	28.99	25.00	25.00	25.00	25.00	25.00		
Imported Crude Oil Prices ^c	33.89	37.05	35.03	33.13	33.14	33.07	33.55	30.20	28.57	29.27	Base	29.40	29.36	29.40	29.40	29.40	29.40	29.40		
											Low	29.65	29.42	30.41	31.17	31.93	32.74	31.56		
U.S. Refiners' Cost ^d	28.07	35.24	33.05	31.20	31.53	31.78	31.87	29.62	28.61	28.87	High	27.93	28.76	25.00	25.00	25.00	25.00	25.00		
											Base	29.40	29.12	29.40	29.40	29.40	29.40	29.40	29.40	
											Low	29.65	29.19	30.41	31.17	31.93	32.74	31.56		
(number of degree days)																				
Weather ^e																				
Heating Degree Days	4,857	4,653	2,542	600	105	1,507	4,754	2,227	660	88		1,669	4,644	2,398	539	88	1,669	4,694		
Cooling Degree Days	1,281	1,167	36	294	703	65	1,098	19	268	898		63	1,248	28	327	755	63	1,173		

^aMacroeconomic projections from three DFI 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, October 1983.

^bSeasonally adjusted at annual rates.

^cCost of imported crude oil to U.S. refiners.

^dU.S. refiners' acquisition costs of foreign and domestic crude oil.

^eDegree day data weighted by population, revised December 1981.

Sources: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/08), Bureau of Economic Analysis, U.S. Department of Commerce, Survey of Current Business, as revised, October 1983; National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Monthly State, Regional, and National Heating Degree Days Weighted by Population, September 1983; and the Federal Reserve System, Data Release C.12.3., October 1983.

Macroeconomic forecasts based on modifications to Data Resources, Inc., forecasts CONTROL102683, OPTIM102783, and PESSIM107683.

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 OPTIM102783, in which real GNP is forecast to grow by 3.5 percent from 1982 to 1983 and by 6.1 percent from 1983 to 1984. The low economic growth case is based on DRI's PESSIM102683 forecast. In this case, GNP grows at 3.4 percent between 1982 and 1983 and 5.3 percent between 1983 and 1984. The range of macroeconomic forecasts is narrower than in previous issues of the Outlook.

Energy Product Prices

Petroleum product prices in nominal terms are expected to remain nearly flat throughout the forecast period, in line with the assumption of stable world oil prices. (See Figure 2 and Table 4.) The high and low forecasts of petroleum product prices shown on Table 4 are based solely on variations in the world oil price assumption.) Small price fluctuations between quarters result mainly from seasonal variations. For example, the retail price of heating oil is highest during the winter quarters.

Except for seasonal variations, the price of motor gasoline is expected to remain nearly stable through 1984. Prices during the peak driving season (late spring and early summer) are projected to be about 5 cents higher than during the fourth quarter of 1984, when gasoline is forecast to cost \$1.21 per gallon.

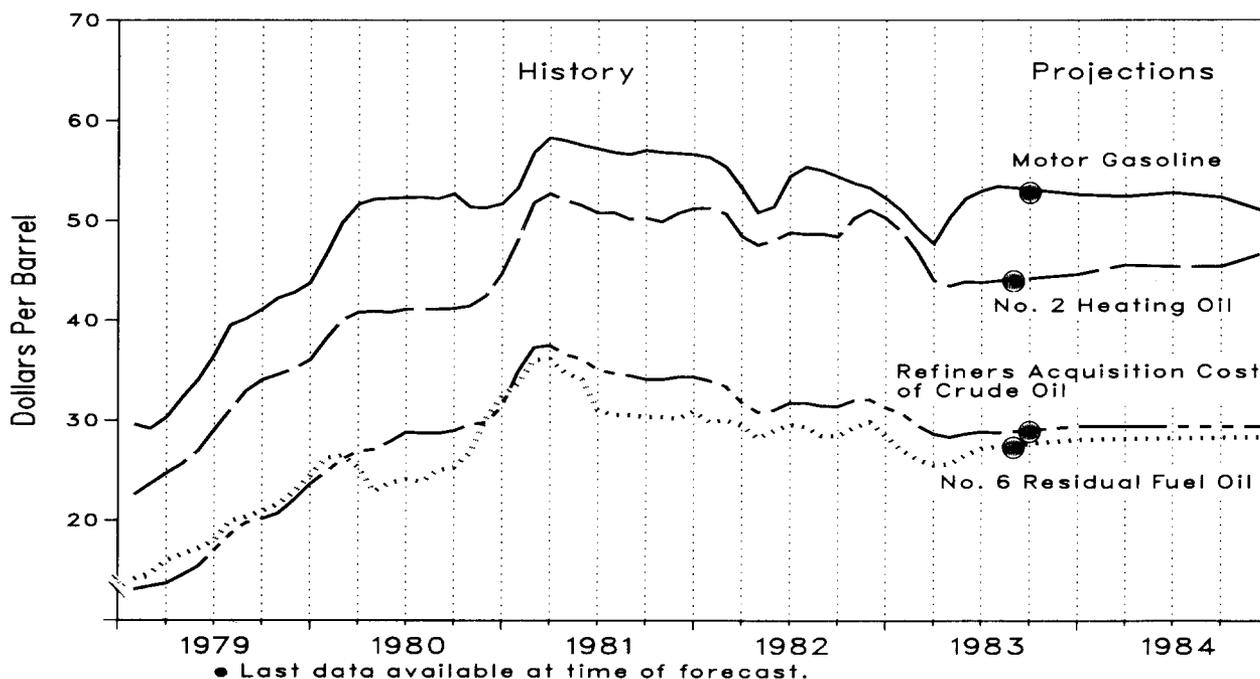


Figure 2. Retail Prices for Petroleum Products

The price of retail heating oil, which is projected to fall by 13 cents between 1982 and 1983, is projected to rise slightly in 1984. However, in real terms, levels are expected to remain relatively flat in 1984.

Following a year of decline, the retail price of residual fuel to final consumers has been rising since July 1983. Increased demand for this fuel as a result of economic growth is expected to increase residual fuel prices by about 4 percent in 1984.

The July 1983 average wellhead price of natural gas was 3 percent above its level 1 year ago. Since most gas is purchased under long-term contracts, price reductions have been achieved by contract adjustments. Some of these actions were unilateral on the part of the pipelines and have resulted in lawsuits by producers. Potential prepayment and other liabilities from these contract actions may be as high as \$5 billion in 1983.

Natural gas prices to electric utilities are projected to increase by only 3 percent in 1983, about the same percentage as the increase in the wellhead price. However, in 1984, this rise is expected to be nearly 13 percent corresponding to anticipated rapid growth in wellhead prices in 1984.

Over half the residential price of natural gas can be attributed to transportation and distribution costs. As a result of increasing transportation margins in recent months, the average price to residential users has not declined. Due to declining volumes and the shifting of these costs from industrial and electric utility customers to residential and commercial customers (in an attempt to make gas more attractive to customers who have been switching to other fuels), the residential price of natural gas is expected to increase by 9.5 percent this winter compared with year-earlier levels. If a larger portion of these costs are borne by the transportation and distribution companies, the residential price increase could be smaller this winter. Natural gas prices to residential users are projected to increase by 8.6 percent from 1983 to 1984 in the base case.

The residential price of natural gas is projected to decrease slightly between the fourth quarter of 1983 and the first quarter of 1984, contrary to recent historical experience of an increase over this period. The projected decrease results from the fact that the forecasted increase in the wellhead natural gas price of about 2 percent (well below the 1976-83 average of 8 percent) between the fourth and first quarters will be more than offset by the normal seasonal decrease in distributor margins. Lower margins are due to the lifeline rate structure used in California, imposing lower winter rates from November through April each year.

World Petroleum Situation

World oil consumption in 1983 is projected to decline for the fourth consecutive year. (See Table 5.) However, the persistent declines in oil demand are expected to end during the second half of 1983 as economic growth and the continued decline in real oil prices in the industrial countries begin to increase requirements for petroleum. Petroleum supply, the sum of production in the market economies and net Communist exports, is projected to total 43.5 million barrels per day during 1983, down by 0.7 million barrels per day from 1982. World oil inventories are expected to be reduced further during 1983 to 4.3 billion barrels, a decline of approximately 500 million barrels since the end of 1982.

The outlook for reversing the trend of declining petroleum demand starting in the third quarter of 1983 is based on assumptions of an overall increase of Gross Domestic Product (GDP) in the Organization for Cooperation and Development (OECD) countries of 2.2 percent in 1983 and 3.8 percent in 1984. (See Table 6.) The projections for the third 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. The major uncertainty for the fourth quarter of 1983 is the weather.

During 1984, three demand stimulating conditions are expected to lead to an increase in world petroleum demand: an increase in world economic growth, a decline in real world oil prices, and a return to normal weather in the Northern Hemisphere. Total petroleum demand in the market economies is expected to increase by an average of 1.5 million barrels per day in 1984 over 1983 levels, of which about one-half occurs in the United States. Combined with this expected increase in demand is an assumed end of the large draw on world petroleum stocks that occurred in 1983 (see Figure 3), creating a required increase in world oil supply of 3 million barrels per day in 1984 over 1983 levels. Of this increase, OPEC's share is expected to be 2.4 million barrels per day.

Table 6. International Economic Growth
(Percent)

Region	Annual Average 1970-1982	1983 ^{a,b}	1984 ^{a,b}
OECD Total ^c	2.8	2.2	3.8
United States ^d	2.7	3.4	5.5
Western Europe ^c	2.6	0.6	1.7
Japan ^d	4.5	4.1	5.1
Other OECD ^e	3.1	1.5	4.7

^aPreliminary estimates.

^bYear-to-year rate of change.

^cGDP.

^dGNP.

^eCanada, 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, Pre-Meeting Forecast, October 1983. Data Resources, Inc.: Canada's Forecast, Control 102683; European Forecast, Control 111183; and Japan's Forecast, Control 111183.

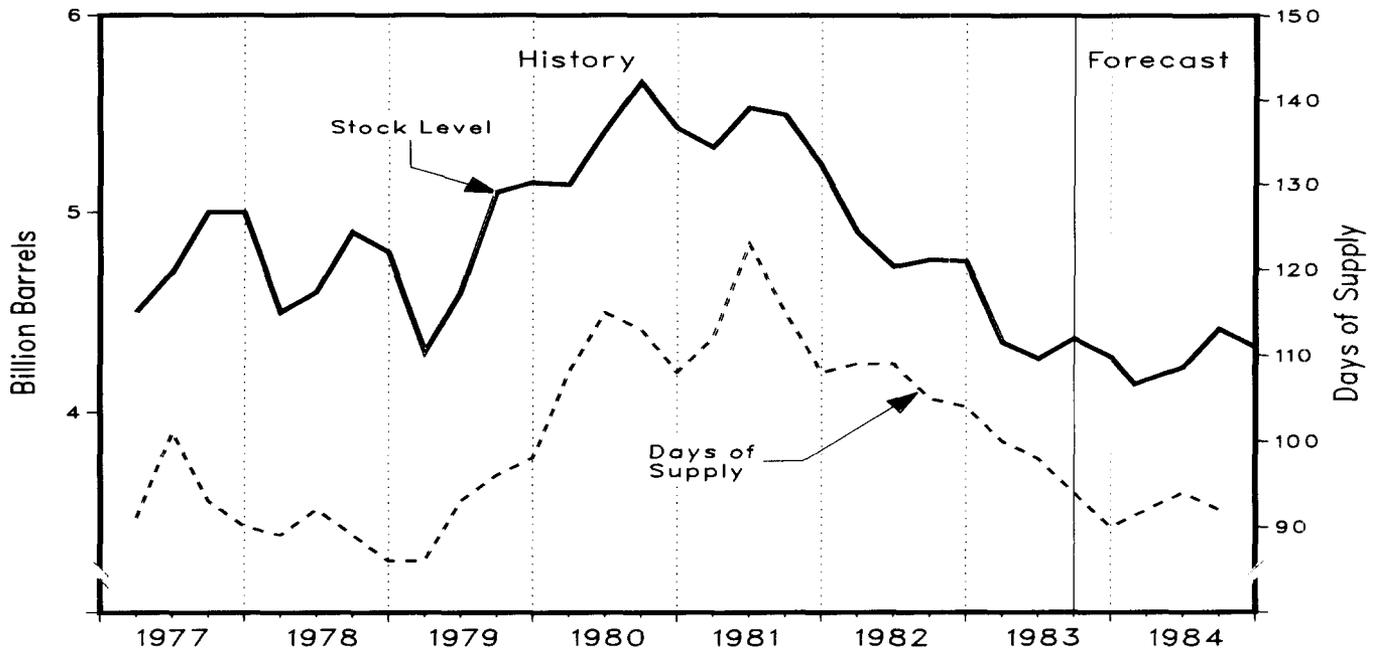


Figure 3. Market Economies Oil Stocks

Table 5 summarizes the international petroleum outlook for the rest of 1983 and the four quarters of 1984. The major uncertainties underlying the outlook for level nominal prices are OPEC's pricing and production policies; the uncertainty regarding the rate of economic growth is the extent to which the 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 pre-December 1983 production quota of 17.5 million barrels per day by over 3 million barrels per day. Preliminary data indicate that production by OPEC members exceeded their aggregate quota by 1 million barrels per day in the third quarter of 1983. 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 increasing the production quotas as needed to meet demand. However, at 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 pre-December quota. Alternatively, if OPEC's current discipline on restraining production is not maintained, overproduction by OPEC could lead to a decrease in 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, economic growth is not as strong as projected, or 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 the world oil price and further uncertainty about OPEC's policies.

During 1982 and 1983, the decline in world oil consumption has been accompanied by large drawdowns of world oil inventories. These drawdowns are projected to end in the second half of 1983 (see Figure 3). The lower than normal inventory levels, based on recent historical standards, should not cause concern over whether end-of-1983 inventories will be adequate for anticipated requirements. The projected inventory level of 4.3 billion barrels at the end of 1983 is equivalent to an estimated 90 days of projected oil consumption, which is higher than the estimated 85 days of forward consumption that existed at the outbreak of the Iranian revolution. Moreover, the current surplus in sustainable world production capacity and low refinery utilization rates around the world should ensure that international oil stocks will be sufficient for 1984. From 1983 to 1984, world commercial oil stocks are projected to remain roughly level on a seasonally adjusted basis, with the United States expected to continue filling the Strategic Petroleum Reserve.

Ten Years After the OPEC Oil Embargo

In October 1973, Arab members of the Organization of Petroleum Exporting Countries (OPEC) instituted an embargo on oil exports to the United States, Europe, and Japan, following the Yom Kippur war. Ten years after this event, the most significant changes in the U.S. petroleum markets appear to be: (1) a sevenfold increase in crude oil prices, from about \$4 per barrel in 1973 to an estimated \$29 per barrel in 1983; (2) a 27-percent decrease in net petroleum imports, from 6 million barrels per day in 1973 to an estimated 4.4 million barrels per day 10 years later; and (3) the building of a Strategic Petroleum Reserve, which is expected to reach 380 million barrels by the end of 1983.

Two other changes in petroleum supply and demand patterns are related to these developments. Total petroleum demand in 1973 averaged 17.3 million barrels per day; in 1983, demand is estimated to be 15.2 million barrels per day, a decline of about 12 percent over the period. (An even more dramatic change is the 5-year decline of about 20 percent in petroleum demand, following record consumption of 18.8 million barrels per day in 1978.) Given the substantial increase in real GNP which occurred over the past 10 years, the decrease in consumption reflects significant improvements in efficiency. The energy/output ratio (in Btu per 1972 dollar of GNP) decreased from 59,500 in 1973 to an estimated 45,800 a decade later, a 23-percent decline. Contributing to this improvement was a 28-percent increase in the average efficiency of U.S. passenger cars, from a low point of 13.1 miles per gallon 10 years ago to a projected 16.8 miles per gallon in 1983.

Finally, U.S. dependence on petroleum imports has declined substantially. In 1973, the United States imported 35 percent of total domestic requirements. By 1977, over 46 percent of total petroleum demand, or 8.6 million barrels per day, was being imported, marking the peak year for U.S. reliance on foreign oil. In 1983, U.S. petroleum imports are expected to be about 29 percent of estimated demand, including only 0.5 million barrels per day (or 3 percent of estimated demand) from the Arab OPEC countries. If a disruption of oil supplies in the Middle East occurred, the impact on the United States would be greater than direct U.S. imports from the region, due to the interdependence of world oil markets. Nevertheless, the current level of U.S. imports from the Arab countries represents a striking change from the situation as recently as 1977, when direct imports from the Arabs represented 17 percent of U.S. consumption.

U.S. Petroleum Outlook

Overview

A decline in total petroleum demand is expected again in 1983, for the fifth consecutive year. The trend is expected to reverse in 1984, as total petroleum demand is projected to increase by 4.7 percent in 1984 to 15.9 million barrels per day. (The base case forecast is presented in Table 7; alternative cases for high and low economic growth are shown in Tables 8 and 9, respectively.) The fuel oils are expected to lead the increase (based upon the assumptions of normal weather and substantial increases in industrial production), but increases are expected in motor gasoline and "other" petroleum products as well.

Total demand for petroleum in 1983 is expected to be about 15.2 million barrels per day, down 0.1 million barrels per day from the 1982 level. The projected slight increases in consumption of gasoline, distillate, and other products are expected to be more than offset by a 16-percent decline in residual fuel oil consumption, as conservation and alternate fuel use dampen demand in the commercial and industrial sectors. (The sensitivity of total petroleum consumption to uncertainty about price, weather, and economic activity is shown in Table 10.)

Even though total petroleum demand in 1984 is projected to exceed the 1983 level, the 1984 projection is still 1 percent below the 1981 level of 16.06 million barrels per day. The 1984 forecast is below 1981 demand despite projected 1984 industrial output (the key variable driving industrial demand for petroleum) almost 9 percent above 1981 output, and projected world oil prices, adjusted for inflation, more than 30 percent below 1981 average prices. If industrial output were to increase at the same rate as GNP (5.5 percent) between 1983 and 1984 rather than at the 10.0 percent now assumed, it is estimated that total petroleum demand would be over 0.3 million barrels per day less than the base case forecast, or about 15.6 million barrels per day.

Primary petroleum stocks are projected to be built to 1.14 billion barrels by the end of 1984, still slightly below the opening level of 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.

Net imports, including those for the Strategic Petroleum Reserve (SPR), are projected to average 5.5 million barrels per day in 1984, up over 25 percent from the estimated 1983 level. The projected increase in imports is slightly greater than the increase in total petroleum demand for two reasons: (1) a projected slight increase in primary inventories, and (2) a projected decline in lower-48 crude oil production because of lower drilling and exploration activity during the past year.

Domestic Petroleum Production

Domestic crude oil production in 1983 is projected to be 8.66 million barrels per day, essentially unchanged from the 1982 level. A year-to-year decline of 1.5 percent, to about 8.5 million barrels per day, is projected from 1983 to 1984. (See Table 7.) Alaskan North Slope production is expected to change little from 1982

through the forecast period. Much of the recent slowdown in the decline of petroleum production in the Lower-48 States is attributed to higher production from reserves in older producing areas, rather than to the discovery of significant new reserves. Lower-48 States' production is projected to decline by almost 2 percent from 1983 to 1984.

Exploration and drilling activity has been slowed by the drop in the price of crude oil since early 1981 together with high real interest rates. Recent declines in the cost of drilling and the stabilization of the outlook for oil prices could lead to a rise in drilling activity. The total number of rotary rigs in operation peaked in December 1981 and has been below year-earlier levels from April 1982 through September 1983. The average number of rotary rigs in operation during the first 9 months of 1983 averaged more than 36 percent below year-earlier levels, but had risen to less than 10 percent below year-earlier levels by August 1983. The total number of crews engaged in seismic exploration peaked in September 1981 and declined almost continuously through April 1983, when the count was almost 26 percent below year-earlier levels. By September 1983, the number of crews engaged in seismic exploration had risen to only 6 percent below year-earlier levels.

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. (See Table 11 and Figure 4.) End-of-third-quarter primary stocks (excluding SPR) for 1983 and 1984 are projected to be 72 and 70 days' supply (at the next quarters' anticipated rates of product supplied), respectively. This forecast represents a substantial decline from the nearly 80 days' supply at the end of the third quarter of 1981, but well above the 66 days' supply level reached 2 years earlier. Moreover, SPR stocks, which were just above 90 million barrels by the end of 1979, are currently forecast to be over 425 million barrels by the end of 1984.

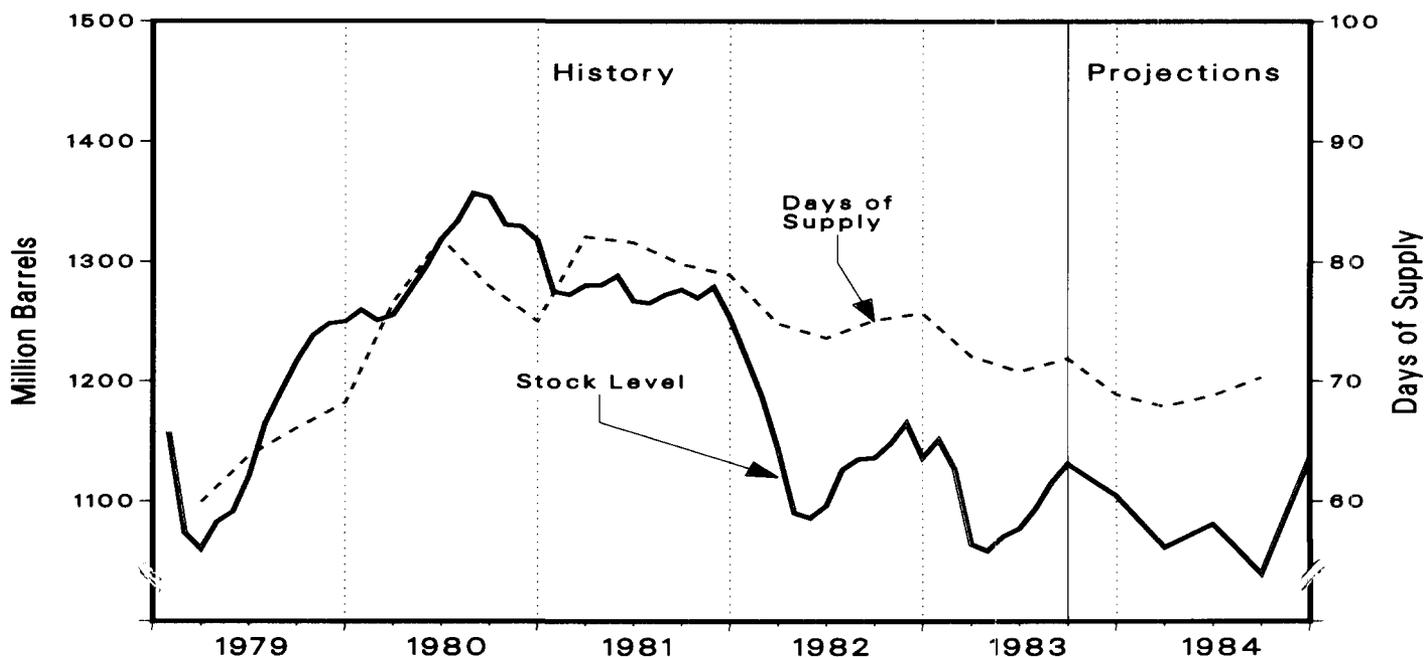


Figure 4. Total Petroleum Inventories, Excluding SPR

Throughout the forecast period, seasonal changes in petroleum product stocks are projected to be slightly less pronounced than in the past. Seasonal swings in total petroleum inventories are expected to continue to be dominated by product stocks while crude oil inventories continue to be stable. The projection of crude oil fill rates for the SPR is based on SPR crude oil delivery contracts for the fourth quarter of 1983 and a forecast for 1984 deliveries, provided by the SPR program office.

Petroleum Imports

As shown in Table 7, net petroleum imports already have risen from the very low level of 3 million barrels per day reached in the first quarter of 1983. During 1983, net petroleum imports are projected to be up only slightly from the 1982 level of 4.3 million barrels per day. (Net imports in 1982 were the lowest since 1971.) In 1984, net imports are projected to average 5.5 million barrels per day, about 26 percent above year-earlier levels.

Total 1983 oil imports, measured on a balance-of-payments' basis, are projected to cost about \$50 billion (almost 20 percent less than in 1982), as a result of both lower imports and lower prices for crude oil. This decline is about equal to the 21-percent drop in the cost of petroleum imports from 1981 to 1982, when oil imports cost \$61.2 billion. Imports in 1984 are projected to cost approximately \$60 billion, about 20 percent more than in 1983. This increase is attributable almost entirely to an increase 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 10 shows the response of petroleum demand to changes in prices, 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 4, 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 3, holding prices at their base case trajectories.
- 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.
- The preliminary data adjustment is based on a comparison of the forecast demand with very recent, but still preliminary, data.

The upper range of projected demand in Table 10 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 and the squared preliminary data adjustment (see Figure 5).

The variation in petroleum demand due to price is the largest of the sensitivity cases analyzed, with a range of as much as 0.4 million barrels per day between the base and low price cases. Weather sensitivity differentials are highest in the first and fourth quarters, as heating demand affects petroleum consumption to a greater degree than does cooling demand in the summer. The range of impacts related to economic activity is lower than in previous Outlooks, primarily because of a narrower band of uncertainty attached to the macroeconomic forecasts.

Motor Gasoline

Consumption of motor gasoline has declined each year since 1978, although from 1981 to 1982 consumption was nearly flat, falling by only 0.7 percent. For the first 9 months of 1983, motor gasoline product supplied (consumption) has increased 0.6 percent from year-earlier levels. The forecast of motor gasoline consumption is still basically flat between 1982 and 1983, with consumption projected to increase by about 60,000 barrels per day to an average of 6.60 million barrels per day in 1983 (see Table 12). In 1984, gasoline consumption is expected to continue increasing slightly, reaching an average of 6.71 million barrels per day.

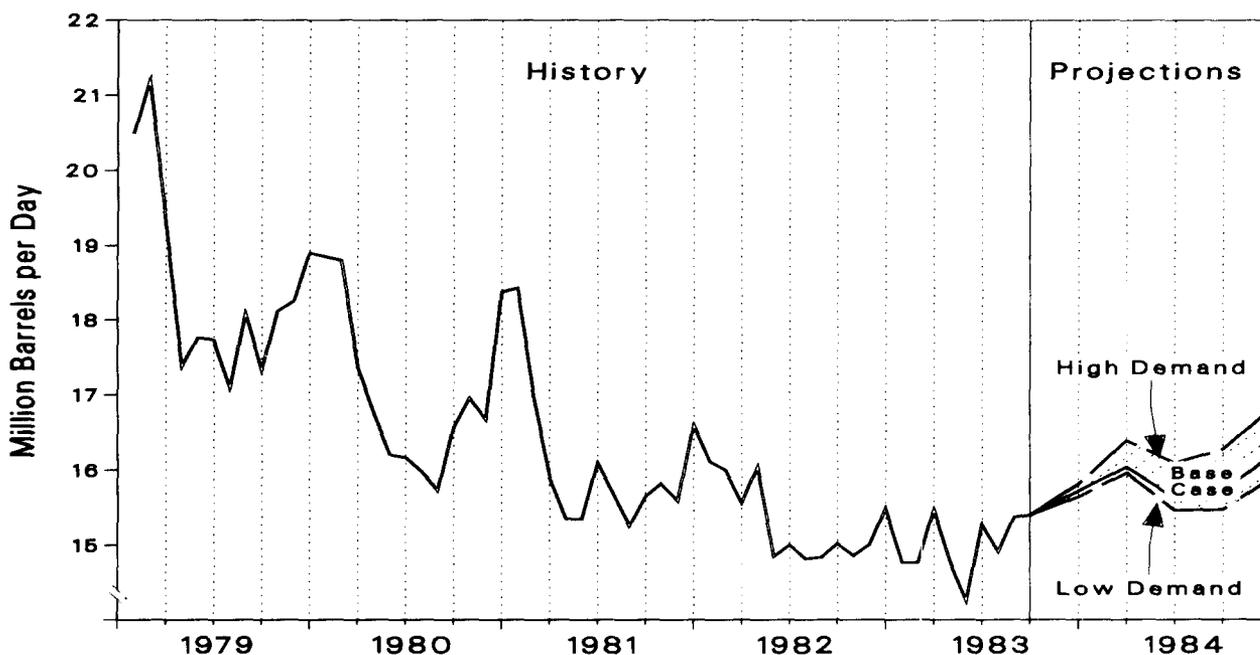


Figure 5. Total Petroleum Demand

The individual determinants of motor gasoline demand generally indicate an increase from 1983 to 1984. The economy is projected to continue to improve throughout the forecast period: Both consumers' income and industrial production are expected to increase significantly, and the unemployment rate is expected to decline in 1984. These factors, combined with projected falling real costs of fuel, are expected to stimulate demand for travel and thus consumption of gasoline in 1983 and 1984. While the average efficiency of the automobile stock is forecast to increase by 3 percent from 1982 to 1983 and by almost 4 percent from 1983 to 1984, the demand-stimulating factors are expected to more than offset these efficiency improvements, reversing the 5-year declining trend in gasoline consumption.

Distillate Fuel Oil

Distillate fuel oil demand in the base case is projected to average 2.70 million barrels per day in 1983, about the same level as in 1982. (See Table 13.) The effect of a strong economic recovery during the second half of 1983 and an assumed normally cold fourth quarter are expected to offset depressed levels of demand during the first half of the year. Through May 1983, distillate demand was down over 9 percent from year-earlier levels. Third-quarter demand, however, was almost 8 percent above the level during the third quarter of 1982 as a result of the economic recovery (particularly in the industrial sector).

Continued economic recovery, stable or falling real prices of distillate fuel oil, and assumed normal weather are projected to cause an increase in distillate demand in 1984 for the first time in 6 years. Consumption in 1984 is expected to average 2.88 million barrels per day, about 7 percent above 1983 levels. The primary cause of the increase is economic activity, particularly industrial production, which is now projected to rise 10 percent in 1984 (after a healthy 8-percent increase in 1983). The real price of distillate fuel oil is expected to decrease by just over 1 percent between 1983 and 1984. Population-weighted heating degree days in 1984 are expected to be only about 1 percent higher than during 1983: the abnormally cold weather in the second-quarter of 1983 offset, to some extent, the abnormally warm first quarter weather, resulting in total heating degree days close to normal for 1983.

Most of the projected 1984 increase in distillate demand occurs 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. Demand for heating oil in the residential, commercial, and industrial sectors is projected to increase about 160,000 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 industrial activity. The narrowing difference between gasoline and diesel prices, together with plentiful supplies of gasoline, appears to have significantly slowed down "dieselization" of the private automobile fleet, at least in the short term.

Residual Fuel Oil

In 1982, residual fuel oil consumption averaged 1.72 million barrels per day. For 1983, this level is expected to drop to slightly less than 1.5 million barrels per day. (See Table 14.) Much of this decline can be attributed to the slow economic activity in the first half of 1983 and to the corresponding drop in total electricity generation, which accounts for over 40 percent of total residual fuel oil demand.

In 1984, demand for residual fuel is expected to increase by nearly 15 percent over 1983 levels to 1.65 million barrels per day. A stronger economy is the main reason for this projected rise, with about the same percentage increase occurring in both the utility and nonutility sectors. Demand for residual fuel oil is not expected to rebound to the levels of nearly 3 million barrels per day experienced during the 1970's, given the much higher prices for residual fuel oil, the shift from residual fuel oil to other fuels that occurred since its peak year in 1977 and the increased efficiency in industrial fuel use (in part caused by the higher prices).

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.

Jet fuel consumption, which remained flat at 1.01 million barrels per day in 1981 and 1982, is expected to increase by about 3 percent in 1983 to 1.05 million barrels per day and by 6 percent to 1.11 million barrels per day in 1984. Primarily responsible for the increases is an expected upturn in domestic air travel (both business and pleasure) in response to the continued economic recovery. Another contributing factor is the return to nearly normal airline schedules following temporary reductions related to the Professional Air Traffic Controllers Organization (PATCO) strike in 1981.

Consumption of liquefied petroleum gases (LPG's), excluding ethane, is expected to decline in 1983 to under 0.9 million barrels per day from the 1982 level of 1 million barrels per day. A further decline to about 0.75 million barrels per day is projected for 1984. Propane, which is the largest product in this category, has important uses in the residential, commercial, and industrial sectors. Since 1981, propane use has declined due to conservation and the availability of alternate fuels, particularly natural gas. This trend is expected to continue through 1984.

Demand for "other" petroleum products, excluding jet fuel and LPG's, but including ethane, unfinished oils, and aviation and motor gasoline blending components, is expected to increase in both 1983 and 1984 due to the increase in economic activity. Demand in 1983 is expected to average about 2.5 million barrels per day, with a further increase to almost 2.8 million barrels per day in 1984. Of particular importance in this category are petrochemical feedstocks, which historically have been sensitive to changes in chemical production. Chemical production is expected to continue its strong recovery, with a 9.4-percent increase expected in 1984, following an estimated 9.7-percent upturn in 1983.

Projections for Other Major Energy Sources

Natural Gas

Total U.S. natural gas consumption and production are forecast to decline in 1983 for the 4th consecutive year. In the first three quarters of 1983, natural gas consumption and production dropped sharply, by 9.9 percent and 12.9 percent, respectively, from year-earlier levels (see Table 15). In the fourth quarter of 1983, domestic natural gas consumption is expected to rise by 1.3 percent while domestic production remains 2.4 percent below year-earlier levels. The outlook for natural gas consumption and production between 1983 and 1984 is for increases of 3.4 percent and 6.6 percent, respectively. The projected turnaround in natural gas demand is contingent on the effects of a strong economic recovery, along with a return of normal winter weather, overriding the effects of higher natural gas prices.

Natural Gas Demand. Total industrial, residential, and commercial gas consumption is forecast to decline by 7.1 percent to 13.0 trillion cubic feet in 1983. In the first quarter of 1983, total industrial, residential, and commercial gas use was 14.7 percent below year-earlier levels, largely driven by the lower heating requirements because of the mild winter and higher gas prices. Despite the colder-than-normal second quarter of 1983 (particularly in April and May), total gas demand during the second quarter for the three sectors combined, relative to year-earlier levels, declined slightly. In the third quarter of 1983, total gas demand for the three sectors combined was 10 percent below year-earlier levels; natural gas demand apparently had not responded to the economic recovery during the second and third quarters of the year. By the fourth quarter of 1983, total demand for the three sectors combined is forecast to be about 1 percent above year-earlier levels, as the demand for gas begins a turnaround. The forecast of economic growth and the assumed return to normal heating-season requirements result in a forecast for 1984 of gas demand for the combined industrial, residential, and commercial sector that is 3.3 percent above year-earlier levels.

Electric utility demand for natural gas is forecast to decline by 8.4 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 electric generation in the third quarter of 1983 (resulting from the summer heat wave) and a pickup in industrial gas sales, electric utility gas use continued to be 5 percent below year-earlier levels. In the fourth quarter of 1983, with the demand for electricity projected to continue its recent increasing trend, electric utility natural gas use is expected to be slightly above the level in the same period of 1982. In 1984, electric utility demand for natural gas is projected to be only 3 percent above the 1983 level, despite the forecast 3.6-percent increase in total electricity generation, because of the expected large increase in coal-fired and nuclear-powered capacity.

Natural Gas Supply. Domestic production of natural gas is projected to be 15.7 trillion cubic feet in 1983, which is 10.3 percent below the 1982 level and the lowest level in 17 years. In the first three quarters of 1983, only 11.6 trillion cubic feet of natural gas were produced, reflecting the depressed level of natural gas demand. Concurrent with the expected recovery of natural gas demand in 1984, natural gas production is projected to rise to 16.8 trillion cubic feet, a 6.6-percent increase over the 1983 level.

Imports of Algerian liquefied natural gas (LNG) during the first three quarters of 1983 were about 107 billion cubic feet, 4 times the amount received in the same period in 1982, while U.S. LNG exports remained level. In the forecast period, U.S. LNG exports are expected to remain essentially unchanged while LNG imports from Algeria continue at their most recent level of about 8 billion cubic feet per month.

Coal

Domestic demand for coal in 1983 is expected to be 733 million tons, which is within 1 million tons of the peak level reached in 1981. (See Table 16.) This forecast for 1983 is higher than the levels forecast in the August 1983 Outlook; a high level of electricity generation from coal in the third quarter of this year is largely responsible for this upward revision. Much of the increase in total electricity generation forecast for 1984 is expected to be supplied by coal-fired generation, resulting in more efficient utilization of existing and new coal-fired plants.

Coal Consumption. Because of extremely hot weather in July and August, the third quarter of 1983 was a record quarter for coal consumption at electric utilities. Despite the assumption that weather in 1984 will return to normal, coal-fired plants are expected to provide a greater share of increased generation than was previously estimated. This development has led to a significant upward revision in the forecast of utilities' use of coal in 1984. Total electricity generation is expected to increase by 83 billion kilowatt-hours between 1983 and 1984, and hydroelectric generation is forecast to decline by 37 billion kilowatt-hours from the record levels in 1983 as precipitation returns to normal levels: the net result is 120 billion kilowatt-hours of additional generation required from coal, nuclear, and other types of nonhydroelectric plants to meet the demand for electricity. The experience of 1983 indicates that utilities will make maximum use of coal plants to handle this substantial increase in system load. Specifically, a 6-percent increase in coal-fired generation and a comparable increase in utilities' coal consumption is forecast for 1984. Under the base case assumptions, coal consumption at utilities in 1984 is expected to increase by 39 million tons over the 1983 levels. (See Table 16.)

Coke plants exhibited a slower-than-expected recovery in coal demand during the second quarter of 1983, and previous estimates were revised downward by nearly a million tons. The second half of 1983 is expected to bring some increase, but at yearend, coking coal consumption is forecast to be about 41 million tons, which is about equal to the 1982 level. Growth in coke plant use of coal should be stronger in 1984 but is not expected to push coking coal consumption up to pre-1982 levels. Increased competition from imported raw steel and little anticipated improvement in domestic capacity by the coking industry have dampened the outlook for coking coal in the United States.

Coal Exports. Coal exports were 3 million tons greater in the third quarter of 1983 than was forecast in the August 1983 Outlook. However, growth in exports between 1983 and 1984 is still expected to be quite modest, increasing from an estimated 79 million tons in 1983 to 80 million tons in 1984.

Effects of Coal Labor Union Contract Negotiations. The coal production and stock level forecasts presented in Table 16 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. However, this behavior is not expected to affect total production or yearend stock levels for 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.

Electric Power

Total electricity generation in 1982 (see Table 17) was 2,241 billion kilowatt-hours, a 2.3-percent decline from the 1981 level. Generation continued to lag behind historical levels during the first half of 1983, falling 2.4 percent below year-earlier levels, primarily because of the slow recovery of industrial electricity demand and unusually mild weather. It appears that a turning point in generation occurred during the summer of 1983, when very hot weather and rising economic activity led to a third-quarter generation level 8.1 percent above year-earlier levels. Total generation in 1983 is now expected to be 2,293 billion kilowatt-hours, 2.3 percent above the 1982 level. Industrial demand for electricity appears to be increasing as a result of the rapid recovery in industrial production during 1983.

Electricity generation in 1984 is projected to be 2,377 billion kilowatt-hours, a 3.6-percent increase from the 1983 level. The revised estimate of growth in generation between 1983 and 1984 (compared to the 5.3-percent forecasted increase published in the August 1983 Outlook) results from the higher 1983 level of generation now being projected. The forecast level of generation in 1984 is about the same as the level projected in August 1983. If economic activity does not achieve the growth rates assumed in the base case (including 1983 to 1984 growth of 4.4 percent in disposable personal income) or if the turnaround in industrial electricity demand is not as strong as projected (perhaps indicating some fundamental structural change), total electricity demand could be lower than the levels forecast here.

The residential price of electricity, which has been increasing at double-digit rates for the past 3 years, is expected to increase only 3.8 percent from 1982 to 1983 and 7.2 percent from 1983 to 1984. Interest rates for newly issued utility bonds are forecast to be lower in 1983 and 1984 than in 1982. Increases in the nominal cost of fuel to electric utilities during the forecast period are expected to be lower than between 1981 and 1982 but higher than between 1982 and 1983.

Generation by Energy Source. Shares of electricity generation in 1983 are expected to be: 55 percent coal, 12 percent natural gas, 13 percent nuclear power, 6 percent petroleum, 14 percent hydroelectric power, and less than 1 percent for other energy sources. (See Table 17.) The forecast increase in total generation of 83 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.) The share of coal-fired generation in 1984 is expected to increase to 56 percent of total generation; the share of nuclear generation is also expected to increase.

Electricity generation from nuclear power is forecast to be 289 billion kilowatt-hours in 1983, 2 percent over the 1982 level. This projected level is lower than the forecast published in the August 1983 Outlook because of a slightly lower assumed capacity factor. The performance of nuclear plants in 1983 has been weaker than expected because of a greater than normal number of outages for maintenance and repair. The nature of these outages suggests that many of these problems will continue into 1984.

Three new nuclear units (St. Lucie 2, McGuire 2, and San Onofre 3) began operating during the first 9 months of 1983, and it is assumed that one additional unit (Grand Gulf 1) will be operating by year end. The 8.4-percent increase in nuclear generation projected from 1983 to 1984 is based in part on the assumed startup of 4 new reactors: Diablo Canyon 1, Waterford 3, LaSalle 2, and Palo Verde 1. Projected capacity additions total 4,319 MWe for 1983 and 5,436 MWe for 1984. Nearly all of the additional reactors are expected to reduce oil and gas consumption for baseload generation and to substitute for extraordinary levels of hydroelectric generation available in 1982 and 1983.

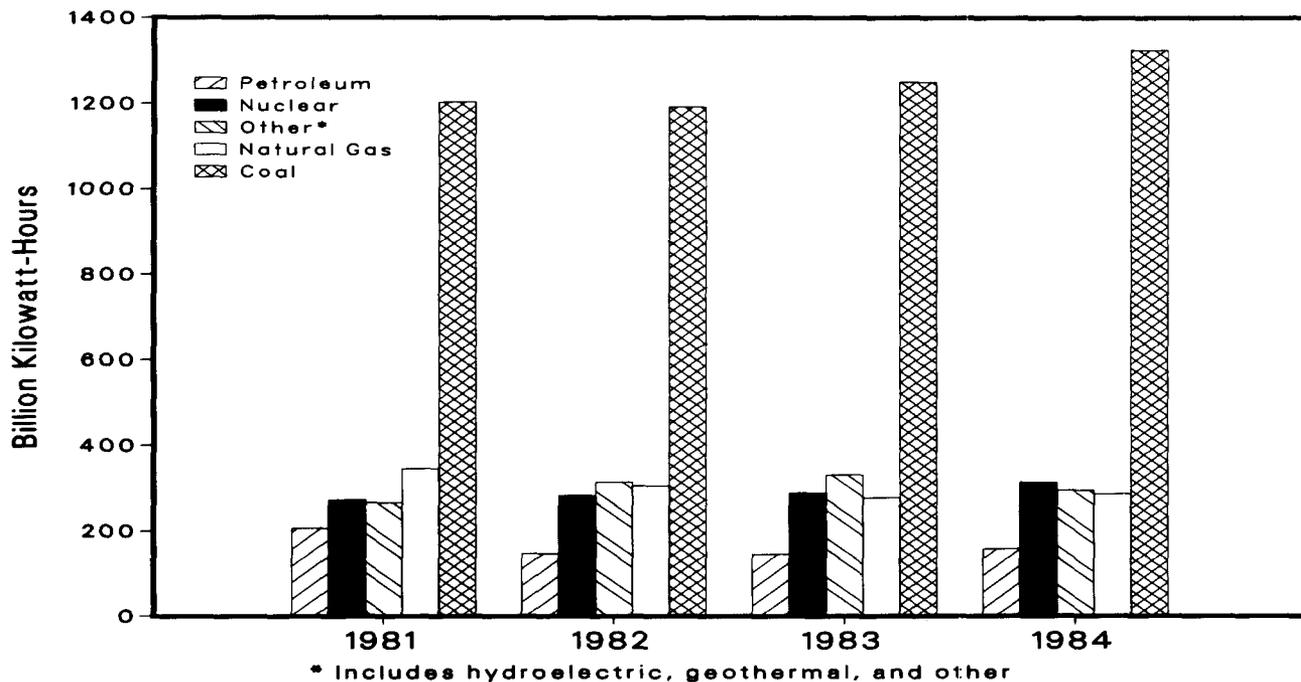


Figure 6. Electricity Generation by Fuel Source

Coal-fired generation dropped by nearly 1 percent from 1981 to 1982 but is expected to increase by 4.9 percent from 1982 to 1983. In the absence of a prolonged coal strike, coal-fired generation of electricity is expected to increase by 5.9 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.

Although the increases in coal-fired generation between 1983 and 1984 may appear large relative to recent experience, this forecast is not without historical precedent. Several years in the 1970's saw larger increases in coal-fired generation. The combined effects of newly available coal capacity, the return to normal levels of hydroelectricity generation (1983 hydroelectric generation is estimated to be nearly 50 billion kilowatt-hours above normal levels), and the 3.6-percent increase in total generation expected between 1983 and 1984 are forecast to result in coal-fired generation of 1,324 billion kilowatt-hours in 1984. Because nuclear-powered and coal-fired generation provide the least expensive means of expanding electricity output, plants consuming these fuels are expected to be utilized where they are available. The projected level of coal-fired generation in 1984 will require an increase in the utilization of generating capacity. Should nuclear-powered or coal-fired generation not be available, electric utilities would be expected to use oil and natural gas to meet additional generation demands.

Hydroelectric generation in 1983 is expected to be a record-breaking 325 billion kilowatt-hours, 5 percent above the previous record set in 1982 and about 17 percent above normal levels. Data for the first 9 months of 1983 show hydroelectric generation 7 percent above the same period a year earlier. Hydroelectric generation in 1984 is projected to be 288 billion kilowatt-hours, which is 3 percent above normal generation. This forecast reflects the benefits of full reservoirs, saturated soils (which result in higher runoff even with normal precipitation), and more aggressive reservoir drawdown policies.

Oil and natural gas consumption by electric utilities has decreased over the past 4 years. Combined generation from oil and natural gas in 1982 dropped over 18 percent from the 1981 level as a result of increased shares of generation from coal and nuclear power, increased availability of inexpensive hydropower, and decreased electricity demand. Use of oil and natural gas is projected to fall an additional 6 percent between 1982 and 1983. Between 1983 and 1984, the resurgence in electricity demand and the impact of the assumption of normal weather conditions lead to the projected increase in oil and gas generation of nearly 21 billion kilowatt-hours. However, oil and gas as a share of total generation are forecast to increase only slightly because most of the growth in generation is projected to be supplied by coal and nuclear power. This projected increase in oil and gas generation in 1984 is lower than the level forecast in the August 1983 Outlook because a major portion of the increase is expected to come from coal-fired generation. If the actual level of electricity generation from coal in 1984 is lower 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 in 1983 is expected to be 70.1 quadrillion Btu, slightly lower than the 1982 level (see Table 18). In 1984, total energy consumption is projected to increase for the first time since 1979, reaching 73.0 quadrillion Btu (see Figure 7). The projected 4-percent increase in consumption from 1983 to 1984 is based on real GNP increasing by 5.5 percent and a return to normal weather after the winter of 1982-83, which was 9 percent warmer than normal.

With GNP forecast to grow faster than energy consumption from 1983 to 1984, the energy/GNP ratio is projected to decrease for the fourteenth consecutive year. The energy intensity of U.S. economic activity is projected to fall to 45.7 thousand Btu per 1972 dollar in 1983 and then decrease to 45.1 thousand Btu per 1972 dollar in 1984.

The consumption of each major energy source (except hydroelectricity) is projected to increase from 1983 to 1984. Hydroelectric generation is projected to decline significantly, largely due to the assumed return to normal weather in 1984 after 2 very wet years which led to record-breaking levels of generation in 1982 and 1983. Nuclear fuel's share of total energy consumption is projected to increase to 4.7 percent in 1984 (from 4.5 percent in 1983 and 4.3 percent in 1982), while hydroelectricity's share is projected to decline to 4.5 percent in 1984 (from 5.3 percent in 1983 and 5.1 percent in 1982). In the fossil fuel group, natural gas's share of total energy consumption is projected to fall slightly from 24.3 percent in 1983 to 24.1 percent in 1984 (compared to 25.8 percent in 1982), and coal's share is projected to increase from 22.7 in 1983 to 23.1 percent in 1984. Oil's share is also projected to remain about constant, at 43 percent, over the 1982-84 period.

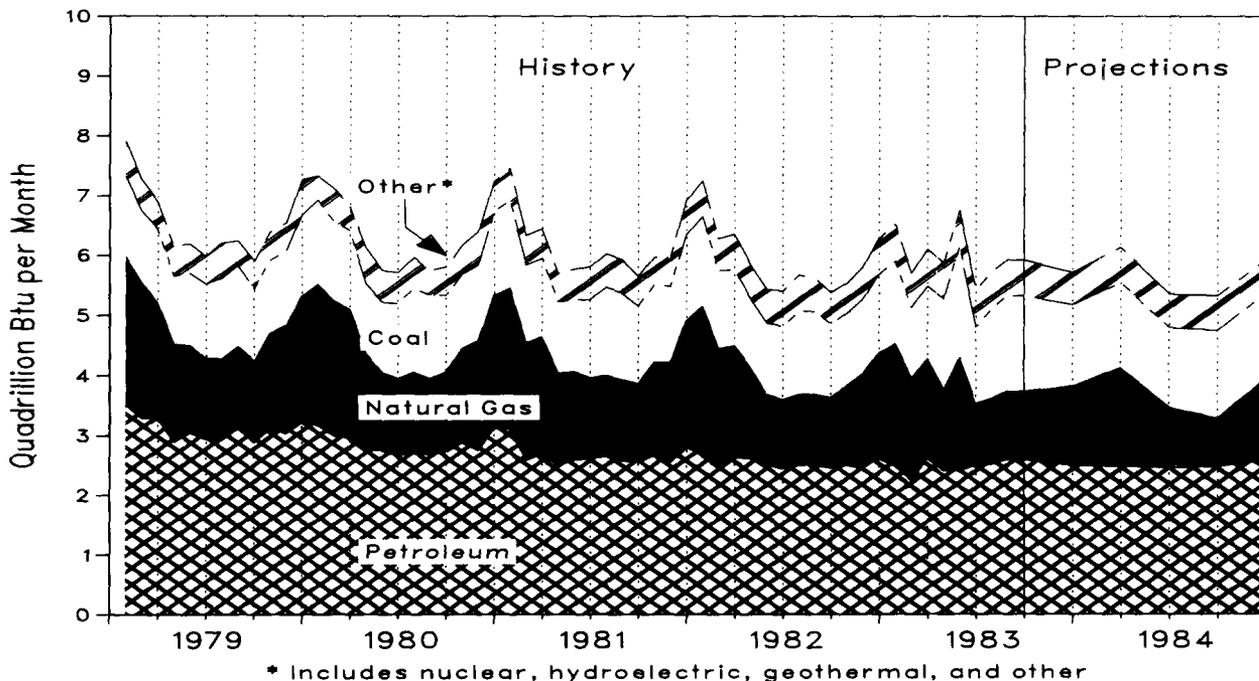


Figure 7. Gross Energy Consumption by Source

At the consuming sector level, utility fuel use is projected to rise slightly over the 1982-83 period, and then to increase by 3.1 percent from 1983 to 1984. Nonutility fuel consumption, by contrast, is projected to decline by 2.6 percent from 1982 to 1983 and then increase by 4.7 percent from 1983 to 1984. (It should be noted that electrical transmission and distribution losses are now included in the total energy consumption figures shown in Table 18. These losses are included with conversion losses under the heading "Utility Losses.")

U.S. energy production is projected to decline by 4.3 percent from 1982 to 1983 and then increase by 3.2 percent from 1983 to 1984. The projected declines in the production of natural gas and coal between 1982 and 1983 are in response to lower domestic demand and a significant loss of coal export markets. With the projected increases in demand for these fuels from 1983 to 1984, production is also expected to increase. However, oil production is expected to decline slightly in 1984. Net imports of energy are projected to increase by almost 25 percent from 1983 to 1984 to provide over 14 percent of the total U.S. energy supplies.

Table 4. Short-Term Energy Prices (Nominal), History and Projections

Product	History						Projections							
	1982		Year	1983		Price ¹	1984		1985		1986			
	3rd	4th		1st	2nd		4th	Year	1st	2nd	3rd	4th	Year	
Petroleum														
Gasoline ² (dollars per gallon)	1.31	1.26	1.28	1.17	1.23	1.26	Low Base High	1.24 1.25 1.26	1.23 1.23 1.23	1.16 1.25 1.27	1.14 1.26 1.30	1.12 1.25 1.31	1.08 1.21 1.29	1.12 1.24 1.29
No. 2 Heating Oil, Wholesale ³ (dollars per gallon)	0.92	0.95	0.92	0.82	0.81	0.83	Low Base High	0.79 0.83 0.83	0.81 0.82 0.82	0.73 0.85 0.87	0.74 0.85 0.89	0.74 0.85 0.91	0.75 0.86 0.94	0.74 0.85 0.90
No. 2 Heating Oil, Retail (dollars per gallon)	1.16	1.20	1.19	1.10	1.04	1.05	Low Base High	1.02 1.06 1.07	1.05 1.06 1.07	0.96 1.09 1.12	0.98 1.08 1.14	0.98 1.08 1.14	0.99 1.09 1.17	0.98 1.09 1.14
No. 6 Residual Fuel Oil ⁴ (dollars per gallon)	0.68	0.70	0.69	0.63	0.63	0.68	Low Base High	0.64 0.67 0.68	0.64 0.65 0.65	0.59 0.67 0.69	0.59 0.67 0.71	0.59 0.67 0.72	0.59 0.67 0.74	0.59 0.67 0.71
Kerosene-Based Jet Fuel (dollars per gallon)	0.95	0.96	0.97	0.93	0.88	0.87	Low Base High	0.87 0.83 0.88	0.89 0.89 0.89	0.81 0.89 0.90	0.78 0.89 0.92	0.77 0.89 0.95	0.76 0.89 0.97	0.78 0.89 0.94
Other														
Coal, Delivered to Utilities (dollars per million Btu)	1.65	1.64	1.65	1.68	1.67	1.66	Low Base High	1.64 1.69 1.74	1.66 1.68 1.69	1.67 1.71 1.78	1.70 1.74 1.80	1.72 1.76 1.83	1.75 1.79 1.86	1.71 1.75 1.82
Natural Gas, Residential (dollars per 1,000 cu. ft.)	5.66	6.04	5.53	6.16	6.54	6.63	Low Base High	6.50 6.70 6.90	6.46 6.51 6.56	6.39 6.66 6.92	6.70 7.05 7.41	6.81 7.24 7.67	6.82 7.33 7.85	6.68 7.07 7.46
Natural Gas, to Utilities (dollars per million Btu)	3.50	3.56	3.41	3.38	3.39	3.61	Low Base High	3.47 3.58 3.68	3.46 3.49 3.52	3.56 3.72 3.87	3.72 3.91 4.12	3.85 4.07 4.32	3.76 4.04 4.32	3.72 3.94 4.16
Electricity, Residential (cents per kilowatt-hour)	7.19	6.95	6.86	6.77	7.17	7.47	Low Base High	6.82 7.08 7.34	7.06 7.12 7.19	6.91 7.18 7.48	7.51 7.82 8.16	7.65 7.97 8.33	7.21 7.54 7.88	7.32 7.63 7.96

¹The 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 3.

²Average for all grades and services.

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

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

Note: Third quarter 1983 estimated for coal, natural gas to utilities, and electricity.

Sources: Historical data: Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(83/11), Petroleum Marketing Monthly, DOE/EIA-0380(83/10), and Monthly Petroleum Product Price Report, DOE/EIA-0032(82/13).

Table 5. International Petroleum Balance
(Million Barrels per Day, Except Closing Stocks)

	History				Projections							
	1983				1984							
	1982 Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	
Supply ^a												
Production												
U.S. (50 States)	10.8	10.8	10.7	10.7	10.7	10.7	10.7	10.7	10.6	10.6	10.6	10.7
OPEC	19.7	16.2	17.5	19.7	19.4	18.2	20.2	20.0	21.2	21.1	21.1	20.6
Other Non-OPEC	12.2	12.6	12.8	13.1	13.4	13.0	13.5	13.6	13.6	13.7	13.7	13.6
Total Market Economies	42.7	39.6	41.0	43.5	43.5	41.9	44.4	44.3	45.4	45.4	45.4	44.9
Net Communist Exports	1.5	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Total Supply	44.2	41.2	42.7	45.1	45.1	43.5	46.0	45.9	47.0	47.0	47.0	46.5
Net Stock Additions												
U.S. (50 States excl. SPR)	-0.3	-1.2	0.1	0.6	-0.3	-0.2	-0.5	0.2	0.6	0.0	0.0	0.1
U.S. SPR	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
Other Market Economies	-1.2	-3.5	-1.2	0.4	-0.9	-1.3	-1.2	0.5	1.4	-1.1	-1.1	-0.1
Total Stock Additions	-1.3	-4.5	-0.9	1.3	-1.0	-1.3	-1.5	0.9	2.1	-1.0	-1.0	0.1
Product Supplied												
U.S. (50-States)	15.3	15.0	14.8	15.2	15.7	15.2	16.0	15.7	15.7	16.2	15.7	15.9
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
Japan	4.5	4.8	3.9	4.0	4.5	4.3	4.8	4.1	4.1	4.7	4.1	4.4
OECD Europe	12.1	12.4	11.4	11.0	12.2	11.8	12.8	11.4	11.3	13.0	11.3	12.1
Other Market Economies	13.4	13.3	13.3	13.3	13.4	13.3	13.6	13.5	13.5	13.8	13.5	13.6
Total Market Economies	45.6	45.7	43.6	43.8	46.1	44.9	47.5	45.0	44.9	48.0	44.9	46.4
Closing Stocks (billion barrels)	4.8	4.4	4.3	4.4	4.3	4.3	4.1	4.2	4.4	4.3	4.4	4.3

^a 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(83/11) and 1982 International Energy Annual (DOE/EIA-0219(82)); Organization for Economic Cooperation and Development, Quarterly Oil Statistics, Second Quarter 1983; and Petroleum Economics Limited's World Quarterly Primary Energy and Supply/Demand, October 24, 1983.

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

	History						Projections						
	1982			1983			1984			1984			
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year
Supply													
Production													
Crude Oil	8.66	8.66	8.65	8.66	8.68	8.65	8.63	8.66	8.61	8.56	8.50	8.48	8.53
North Slope	1.63	1.61	1.62	1.64	1.64	1.64	1.65	1.64	1.67	1.65	1.64	1.65	1.65
Subarctic ¹	7.04	7.05	7.03	7.01	7.04	7.02	6.98	7.01	6.93	6.90	6.86	6.83	6.88
Natural Gas Liquids	1.52	1.59	1.55	1.60	1.50	1.56	1.54	1.55	1.55	1.54	1.55	1.56	1.55
Other Domestic	0.06	0.05	0.05	0.05	0.06	0.05	0.06	0.05	0.04	0.05	0.06	0.06	0.05
Processing Gain	0.53	0.58	0.53	0.47	0.48	0.47	0.51	0.48	0.49	0.53	0.54	0.54	0.53
Total Production	10.77	10.88	10.78	10.77	10.72	10.74	10.73	10.74	10.69	10.67	10.65	10.64	10.66
Imports (including SPR)													
Crude Oil	3.91	3.51	3.49	2.49	3.30	4.09	3.92	3.45	3.96	4.80	5.15	5.22	4.78
Refined Products	1.60	1.71	1.62	1.42	1.66	1.85	1.72	1.66	1.92	1.82	2.08	1.95	1.94
Total Imports	5.52	5.21	5.11	3.90	4.95	5.94	5.64	5.12	5.89	6.61	7.23	7.17	6.73
Exports													
Crude Oil	0.24	0.24	0.24	0.18	0.17	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.16
Refined Products	0.56	0.62	0.58	0.70	0.64	0.47	0.48	0.57	0.56	0.60	0.60	0.59	0.58
Total Exports	0.80	0.86	0.82	0.88	0.81	0.64	0.64	0.74	0.72	0.76	0.76	0.75	0.74
Net Imports (incl SPR)	4.72	4.35	4.30	3.02	4.14	5.30	5.00	4.37	5.17	5.86	6.47	6.42	5.99
Primary Stock Levels² (million barrels)													
Opening	1096.03	1136.08	1253.31	1168.20	1063.61	1076.77	1131.15	1168.20	1102.73	1037.25	1056.74	1126.60	1102.73
Closing	1136.08	1136.10	1136.10	1063.61	1076.77	1131.15	1102.73	1102.73	1037.25	1056.74	1126.60	1136.44	1136.44
Net Withdrawals	-0.44	-0.00	0.32	1.16	-0.14	-0.59	0.31	0.18	0.72	-0.21	-0.76	-0.11	-0.09
(million barrels per day)													
SPR Fill Rate Additions(-) ..	-0.15	-0.17	-0.17	-0.20	-0.23	-0.31	-0.23	-0.24	-0.19	-0.22	-0.09	-0.14	-0.16
(million barrels per day)													
Total Primary Supply	14.91	15.06	15.23	14.75	14.49	15.14	15.81	15.06	16.39	16.09	16.27	16.81	16.39
Product Supplied													
Motor Gasoline	6.65	6.50	6.54	6.29	6.68	6.81	6.61	6.60	6.44	6.90	7.06	6.82	6.81
Distillate Fuel Oil	2.26	2.64	2.67	2.83	2.52	2.43	3.05	2.71	3.38	2.90	2.60	3.33	3.05
Residual Fuel Oil	1.52	1.56	1.72	1.57	1.33	1.33	1.57	1.45	1.94	1.66	1.65	1.74	1.74
Other Products ³	4.47	4.42	4.37	4.32	4.23	4.66	4.58	4.45	4.63	4.64	4.97	4.93	4.79
Total Product Supplied	14.89	15.12	15.30	15.01	14.76	15.22	15.81	15.21	16.39	16.09	16.27	16.81	16.39
Unaccounted for	0.01	-0.06	-0.07	-0.26	-0.27	-0.09	0.00	-0.15	0.00	0.00	0.00	0.00	0.00
Total Disposition	14.91	15.06	15.23	14.75	14.49	15.14	15.81	15.06	16.39	16.09	16.27	16.81	16.39

SPR = Strategic Petroleum Reserve.

¹Lower-48 States and southern Alaska.

²Excludes 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*.)

³Includes 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(83/10). Data for September are preliminary.

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

	History									Projections				
	1982			1983			1984			1984				
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	
Supply														
Production														
Crude Oil	8.66	8.66	8.65	8.66	8.68	8.65	8.63	8.66	8.61	8.56	8.50	8.48	8.53	
North Slope	1.63	1.61	1.62	1.64	1.64	1.64	1.65	1.64	1.67	1.65	1.64	1.65	1.65	
Subarctic ¹	7.04	7.05	7.03	7.01	7.04	7.02	6.98	7.01	6.93	6.90	6.86	6.83	6.88	
Natural Gas Liquids	1.52	1.59	1.55	1.60	1.50	1.56	1.54	1.55	1.55	1.54	1.55	1.56	1.55	
Other Domestic	0.06	0.05	0.05	0.05	0.06	0.05	0.06	0.05	0.04	0.05	0.06	0.06	0.05	
Processing Gain	0.53	0.58	0.53	0.47	0.48	0.47	0.50	0.48	0.49	0.53	0.54	0.52	0.52	
Total Production	10.77	10.88	10.78	10.77	10.72	10.74	10.73	10.74	10.69	10.67	10.64	10.61	10.66	
Imports (including SPR)														
Crude Oil	3.91	3.51	3.49	2.49	3.30	4.09	3.81	3.42	3.86	4.41	4.57	4.54	4.35	
Refined Products	1.60	1.71	1.62	1.42	1.66	1.85	1.72	1.66	1.89	1.63	1.80	1.62	1.73	
Total Imports	5.52	5.21	5.11	3.90	4.95	5.94	5.53	5.09	5.75	6.04	6.37	6.17	6.08	
Exports														
Crude Oil	0.24	0.24	0.24	0.18	0.17	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.16	
Refined Products	0.56	0.62	0.58	0.70	0.64	0.47	0.48	0.57	0.56	0.60	0.60	0.59	0.58	
Total Exports	0.80	0.86	0.82	0.88	0.81	0.64	0.64	0.74	0.72	0.76	0.76	0.75	0.74	
Net Imports (incl SPR)	4.72	4.35	4.30	3.02	4.14	5.30	4.88	4.34	5.03	5.28	5.61	5.42	5.34	
Primary Stock Levels² (million barrels)														
Opening	1096.03	1136.08	1253.31	1168.20	1063.61	1076.77	1131.15	1169.20	1107.03	1068.08	1092.51	1156.01	1107.03	
Closing	1136.08	1136.10	1136.10	1063.61	1076.77	1131.15	1107.03	1107.03	1068.08	1092.51	1156.01	1156.73	1156.73	
Net Withdrawals	-0.44	-0.00	0.32	1.16	-0.14	-0.59	0.26	0.17	0.43	-0.27	-0.69	-0.01	-0.14	
(million barrels per day)														
SPR Fill Rate Additions(-) ..	-0.15	-0.17	-0.17	-0.20	-0.23	-0.31	-0.23	-0.24	-0.19	-0.22	-0.09	-0.14	-0.16	
(million barrels per day)														
Total Primary Supply	14.91	15.06	15.23	14.75	14.49	15.14	15.64	15.01	15.96	15.46	15.47	15.88	15.69	
Product Supplied														
Motor Gasoline	6.65	6.50	6.54	6.29	6.68	6.81	6.59	6.59	6.38	6.78	6.90	6.63	6.67	
Distillate Fuel Oil	2.26	2.64	2.67	2.83	2.52	2.43	3.00	2.69	3.23	2.68	2.34	3.02	2.82	
Residual Fuel Oil	1.52	1.56	1.72	1.57	1.33	1.33	1.51	1.44	1.82	1.53	1.49	1.57	1.60	
Other Products ³	4.47	4.42	4.37	4.32	4.23	4.66	4.54	4.44	4.53	4.47	4.73	4.66	4.60	
Total Product Supplied	14.89	15.12	15.30	15.01	14.76	15.22	15.64	15.16	15.96	15.46	15.47	15.88	15.69	
Unaccounted for	0.01	-0.06	-0.07	-0.26	-0.27	-0.09	0.00	-0.15	0.00	0.00	0.00	0.00	0.00	
Total Disposition	14.91	15.06	15.23	14.75	14.49	15.14	15.64	15.01	15.96	15.46	15.47	15.88	15.69	

SPR = Strategic Petroleum Reserve.

¹Lower-48 States and southern Alaska.

²Excludes 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.)

³Includes 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(83/10). Data for September are preliminary.

Table 10. Petroleum Demand: Sensitivity Differentials
(Million Barrels per Day)

Sensitivities	1983				1984			
	4th	Year	1st	2nd	3rd	4th	Year	
Demand in 50 States								
Low Price	15.80	15.21	16.30	15.99	16.11	16.60	16.25	
Base Case	15.72	15.18	16.03	15.62	15.71	16.19	15.89	
High Price	15.68	15.18	15.94	15.49	15.51	15.95	15.72	
Weather Sensitivity								
Adverse Weather	0.16	0.04	0.23	0.03	0.05	0.15	0.12	
Favorable Weather	-0.16	-0.04	-0.23	-0.03	-0.05	-0.15	-0.12	
Economic Sensitivity								
High Economic Activity	0.02	0.01	0.07	0.11	0.17	0.22	0.14	
Low Economic Activity	-0.05	-0.01	-0.01	-0.02	-0.04	-0.06	-0.03	
Preliminary Data								
Adjustment	-0.08	-0.02	-0.06	-0.04	-0.02	-0.00	-0.03	
Combined Sensitivity Differentials (excl. price)								
Upper Range	0.16	0.04	0.24	0.11	0.18	0.27	0.18	
Lower Range	0.19	0.05	0.24	0.05	0.07	0.16	0.13	
Range of Projected Demand								
High Demand ^a	15.96	15.25	16.54	16.10	16.29	16.87	16.43	
Low Demand ^b	15.49	15.13	15.70	15.44	15.44	15.79	15.59	

^aLow Price demand plus the combined effects of adverse weather and high economic activity.

^bHigh Price demand less the combined effects of favorable weather, low economic activity, and the preliminary data adjustment.

Table 11. Petroleum Inventories^a

Unit of Measure	End of 1979	End of 1980 ^b	End of 1981	Base Case Projections		
				End of 1982 ^c	Mid-1983	Mid-1984
Million Barrels	1,250	1,284	1,254	1,136	1,077	1,105
Days' Supply ^d	68.4	75.0	78.9	75.7	70.7	68.9
						68.8

^aPrimary stocks (excluding Strategic Petroleum Reserve).

^bBecause 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).)

^cThe respondent universe for petroleum inventories was expanded in January 1983. This resulted in the addition of 33 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).)

^dInventory level divided by the next quarter's figure for product supplied.

Note: Minor discrepancies with published EIA historical 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(83/11).

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

	History						Projections						
	1982			1983			1984						
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year
Supply													
Domestic Production ¹	6.57	6.36	6.34	5.92	6.41	6.61	6.38	6.33	6.08	6.60	6.83	6.51	6.51
Imports	0.25	0.19	0.20	0.17	0.27	0.28	0.26	0.25	0.26	0.22	0.22	0.22	0.23
Exports	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Net Imports	0.23	0.18	0.18	0.16	0.27	0.27	0.25	0.24	0.24	0.20	0.20	0.20	0.21
Primary Stocks of Finished Motor Gasolines² (million barrels)													
Opening	177.14	191.10	203.47	202.54	183.71	183.32	189.68	202.54	192.31	185.85	185.20	193.67	192.31
Closing	191.10	194.50	194.50	183.71	183.32	189.68	192.31	192.31	185.85	185.20	193.67	195.96	195.96
Net Withdrawals	-0.15	-0.04	0.02	0.21	0.00	-0.07	-0.03	0.03	0.07	0.01	-0.09	-0.02	-0.01
(million barrels per day)													
Total Primary Supply	6.65	6.50	6.54	6.29	6.68	6.80	6.60	6.60	6.39	6.80	6.94	6.69	6.71
Disposition													
Leaded	3.15	3.08	3.13	2.88	3.07	3.05	2.83	2.96	2.68	2.80	2.80	2.65	2.73
Unleaded	3.50	3.43	3.41	3.41	3.62	3.75	3.78	3.64	3.71	4.00	4.14	4.04	3.97
Total Product Supplied	6.65	6.50	6.54	6.29	6.68	6.80	6.60	6.60	6.39	6.80	6.94	6.69	6.71
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	6.65	6.50	6.54	6.29	6.68	6.80	6.60	6.60	6.39	6.80	6.94	6.69	6.71

¹Refinery production plus production at natural gas processing plants.

²Includes 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(83/10). Data for September are preliminary.

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

	History				Projections				Year	
	1982		1983		1984		1984			
	3rd	4th	1st	2nd	3rd	4th	1st	2nd		
Supply										
Refinery Output	2.63	2.78	2.61	2.15	2.39	2.64	2.72	2.58	2.72	2.98
Imports	0.09	0.11	0.09	0.05	0.13	0.27	0.18	0.19	0.20	0.18
Exports	0.07	0.08	0.07	0.11	0.05	0.04	0.04	0.04	0.04	0.04
Net Imports	0.02	0.04	0.02	-0.06	0.08	0.23	0.14	0.15	0.16	0.14
Primary Stock Levels¹ (million barrels)										
Opening	123.69	161.20	191.54	185.58	118.72	113.80	158.39	122.60	122.32	164.40
Closing	161.20	178.59	178.59	118.72	113.80	154.75	122.60	122.32	164.40	163.59
Net Withdrawals	-0.41	-0.19	0.04	0.74	0.05	-0.45	0.39	0.00	-0.46	0.01
(million barrels per day)										
Total Primary Supply	2.25	2.63	2.66	2.83	2.52	2.43	3.25	2.73	2.42	3.13
Product Supplied										
Nonutility Shipments	2.23	2.62	2.64	2.80	2.51	2.39	3.18	2.69	2.37	3.09
Electric Utility Shipments	0.03	0.02	0.03	0.03	0.01	0.04	0.07	0.04	0.05	0.05
Total Product Supplied	2.26	2.64	2.67	2.83	2.52	2.43	3.25	2.73	2.42	3.13
Electric Utility Consumption	0.04	0.03	0.04	0.03	0.03	0.05	0.07	0.05	0.06	0.05
Electric Utility Stock Levels (million barrels)										
Opening	24.65	24.22	26.09	23.37	23.20	21.43	20.39	20.16	19.69	19.34
Closing	24.22	23.37	23.37	23.20	21.43	20.69	20.16	19.69	19.34	18.64
Net Additions	-0.00	-0.01	-0.01	-0.00	-0.02	-0.01	-0.00	-0.01	-0.00	-0.01
(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
Unaccounted for	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00
Total Disposition	2.25	2.63	2.66	2.83	2.52	2.43	3.25	2.73	2.42	3.13

¹The 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), Petroleum Supply Monthly DOE/EIA-0109(83/10), Monthly Energy Review DOE/EIA-0026(83/11), and Electric Power Monthly DOE/EIA-0026(83/09). Data for September are preliminary.

Table 14. Quarterly Supply and Disposition of Residual Fuel Oil: Base Case
(Million Barrels per Day, Except Stocks)

	History				Projections								
	1982				1983				1984				
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year
Supply													
Refinery Output	1.00	0.98	1.07	0.88	0.90	0.76	1.02	0.89	1.09	1.04	0.97	1.14	1.06
Imports	0.69	0.79	0.78	0.67	0.71	0.69	0.68	0.69	0.79	0.75	0.75	0.69	0.74
Exports	0.21	0.20	0.21	0.22	0.24	0.13	0.13	0.18	0.13	0.15	0.15	0.15	0.15
Net Imports	0.48	0.59	0.57	0.45	0.47	0.56	0.55	0.51	0.66	0.60	0.60	0.54	0.60
Primary Stock Levels¹ (million barrels)													
Opening	60.67	61.82	77.99	68.23	46.31	50.08	49.69	68.23	51.85	41.58	47.39	48.78	51.85
Closing	61.82	66.20	66.20	46.31	50.08	49.69	51.85	51.85	41.58	47.39	48.78	53.12	53.12
Net Withdrawals	-0.01	-0.05	0.03	0.24	-0.04	0.00	-0.02	0.04	0.11	-0.06	-0.02	-0.05	-0.00
(million barrels per day)													
Total Primary Supply	1.47	1.52	1.67	1.57	1.33	1.33	1.55	1.44	1.86	1.58	1.55	1.63	1.65
Product Supplied													
Nonutility Shipments	0.90	1.06	1.09	1.04	0.81	0.69	0.96	0.88	1.20	0.95	0.82	1.02	1.00
Electric Utility Shipments	0.62	0.50	0.62	0.53	0.52	0.64	0.58	0.57	0.66	0.63	0.73	0.61	0.66
Total Product Supplied	1.52	1.56	1.72	1.57	1.33	1.33	1.55	1.44	1.86	1.58	1.55	1.63	1.65
Electric Utility Consumption	0.62	0.53	0.64	0.68	0.53	0.70	0.60	0.63	0.76	0.59	0.71	0.62	0.67
Electric Utility Stock Levels (million barrels)													
Opening	97.96	98.16	102.04	95.51	81.63	80.09	74.56	95.51	72.86	64.50	68.14	69.91	72.86
Closing	98.16	95.51	95.51	81.63	80.09	74.56	72.86	72.86	64.50	68.14	69.91	68.91	68.91
Net Additions	0.00	-0.03	-0.02	-0.15	-0.02	-0.06	-0.02	-0.06	-0.09	0.04	0.02	-0.01	-0.01
(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	-0.05	-0.04	-0.05	-0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	-0.00	-0.00	-0.00
Total Disposition	1.47	1.52	1.67	1.57	1.33	1.33	1.55	1.44	1.86	1.58	1.55	1.63	1.65

¹The 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), Petroleum Supply Monthly DOE/EIA-0109(83/10), Monthly Energy Review DOE/EIA-0026(83/11), and Electric Power Monthly DOE/EIA-0026(83/09). Data for September are preliminary.

Table 15. Quarterly Supply and Disposition of Natural Gas
(Trillion Cubic Feet)

	History						Projections						
	1982			1983			1984			1984			
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year
Supply													
Marketed Production of Dry Gas ¹	4.22	4.21	17.55	4.08	3.72	3.83	4.11	15.74	4.22	4.13	4.13	4.30	16.78
Net Imports of Dry Gas	0.18	0.25	0.88	0.27	0.16	0.15	0.25	0.83	0.26	0.20	0.19	0.25	0.89
Net Imports of LNG	-0.00	0.01	0.01	0.03	0.02	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.05
SNG Production	0.02	0.03	0.12	0.03	0.02	0.02	0.03	0.10	0.04	0.02	0.02	0.02	0.11
Total New Supply	4.42	4.50	18.55	4.41	3.93	4.01	4.40	16.75	4.53	4.37	4.35	4.59	17.83
Underground Storage													
Opening	6.15	7.03	6.57	6.88	5.96	6.26	6.96	6.88	6.69	5.71	6.28	7.27	6.69
Closing	7.03	6.88	6.88	5.96	6.26	6.96	6.69	6.69	5.71	6.28	7.27	7.06	7.06
Net Withdrawals	-0.89	0.15	-0.31	0.92	-0.30	-0.71	0.27	0.19	0.98	-0.57	-0.99	0.21	-0.37
Total Primary Supply ¹	3.53	4.65	18.24	5.33	3.64	3.30	4.68	16.94	5.51	3.80	3.36	4.79	17.46
Consumption													
Electric Utilities	1.01	0.71	3.23	0.59	0.67	0.96	0.73	2.96	0.63	0.78	0.94	0.70	3.05
Refinery Fuel	0.14	0.16	0.59	0.14	0.16	0.16	0.17	0.63	0.16	0.17	0.18	0.18	0.69
All Other Uses ²	2.29	3.68	14.02	4.52	2.74	2.06	3.71	13.02	4.65	2.78	2.17	3.85	13.45
Subtotal	3.43	4.55	17.84	5.26	3.56	3.19	4.61	16.61	5.44	3.73	3.29	4.72	17.18
Unaccounted for	0.10	0.10	0.41	0.07	0.07	0.11	0.07	0.32	0.07	0.07	0.07	0.07	0.28
Total Disposition	3.53	4.65	18.24	5.33	3.64	3.30	4.68	16.94	5.51	3.80	3.36	4.79	17.46

¹Excludes nonhydrocarbon gases removed.

²Includes residential, commercial, and industrial uses plus use of synthetic natural gas.

LNG=Liquefied Natural Gas.

SNG=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-0026(83/11), Natural Gas Monthly DOE/EIA-0130(83/10), and Electric Power Monthly DOE/EIA-0026(83/09). Table 15 reflects preliminary 1982 data. Final data are available in the 1982 Natural Gas Annual DOE/EIA-0131(82).

Table 16. Quarterly Supply and Disposition of Coal
(Million Short Tons)

	History				Projections									
	1982				1983				1984					
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	
Supply														
Production	201.38	198.04	838.11	191.05	185.93	199.82	209.73	786.54	201.17	209.17	226.71	202.51	839.56	
Primary Stock Levels ¹														
Opening	36.88	39.68	24.15	36.78	39.25	37.28	33.04	36.78	33.92	31.43	29.76	22.10	33.92	
Closing	39.68	36.78	36.78	39.25	37.28	33.04	33.92	33.92	31.43	29.76	22.10	21.17	21.17	
Net Withdrawals	-2.80	2.89	-12.63	-2.47	1.97	4.24	-0.88	2.86	2.50	1.67	7.66	0.93	12.76	
Imports	0.27	0.23	0.74	0.27	0.38	0.30	0.27	1.22	0.27	0.27	0.27	0.27	1.08	
Exports	25.25	23.84	106.28	15.14	20.35	22.04	21.02	78.56	15.38	21.33	20.77	22.29	79.76	
Total New Domestic Supply ..	173.60	177.32	719.94	173.71	167.94	182.31	188.10	712.06	188.56	189.78	213.87	181.42	773.63	
Secondary Stock Levels ³														
Opening	198.38	189.97	185.27	195.25	191.53	197.04	173.90	195.25	174.35	166.99	172.59	183.18	174.35	
Closing	189.97	195.25	195.25	191.53	197.04	173.90	174.35	174.35	166.99	172.59	183.18	168.64	168.64	
Net Withdrawals	8.41	-5.29	-9.98	3.72	-5.51	23.13	-0.44	20.91	7.36	-5.60	-10.60	14.54	5.71	
Total Indicated Consumption	182.01	172.04	709.96	177.43	162.43	205.45	187.66	732.97	195.92	184.18	203.28	195.96	779.34	
Domestic Consumption														
Coke Plants	9.10	8.04	40.91	8.12	9.09	11.06	12.36	40.63	11.85	11.63	11.29	11.40	46.17	
Electric Utilities	158.50	145.04	593.66	146.16	139.64	178.77	155.96	620.53	163.94	155.31	175.51	164.43	659.19	
Retail and General Industry ..	16.49	18.99	72.33	18.77	16.81	15.61	19.35	70.55	20.13	17.24	16.48	20.13	73.97	
Total Domestic Consumption ..	184.09	172.07	706.90	173.05	165.55	205.45	187.67	731.71	195.92	184.18	203.28	195.96	779.34	
Discrepancy ⁴	-2.08	-0.04	3.06	4.38	-3.12	-0.00	-0.00	1.26	0.00	0.00	-0.00	-0.00	0.00	

¹Primary stocks are those held at the mines, preparation plants, and distribution points.

²Estimated.

³Secondary stocks are those held by users. Most of the secondary stocks are held by electric utilities.

⁴Historical period discrepancy reflects unaccounted for shipper and receiver reporting discrepancies.

Note: Rows and columns may not add due to independent rounding.

Sources: Historical data: Energy Information Administration, Monthly Energy Review DOE/EIA-0035(83/11) and Quarterly Coal Report DOE/EIA-0121(83/2Q).

Table 17. Quarterly Supply and Disposition of Electricity
(Billion Kilowatt-Hours)

	History				Projections										
	1982				1983				1984						
	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Year
Generation															
Coal	317.64	290.29	1192.00	296.45	280.92	359.82	313.05	1250.24	330.91	312.86	351.19	329.46	1324.43		
Petroleum	35.50	30.44	146.80	38.02	30.52	40.81	35.93	145.28	44.65	34.69	41.74	36.80	157.88		
Natural Gas	95.41	67.23	305.26	56.06	62.71	90.79	68.49	278.05	58.75	73.64	88.48	65.34	286.21		
Nuclear	75.84	70.86	282.77	71.19	68.57	76.01	72.79	268.57	75.72	70.89	84.80	81.54	312.95		
Hydroelectric	71.08	70.81	309.21	87.57	91.87	75.57	69.85	324.87	78.16	78.79	66.96	64.25	288.15		
Geothermal and Other ¹	1.43	1.44	5.16	1.36	1.24	1.98	1.69	6.27	1.63	1.58	1.85	1.82	6.88		
Total Generation	596.90	531.06	2241.21	550.66	535.84	644.97	561.80	2293.27	589.82	572.46	635.02	579.21	2376.50		
Total Net Imports	7.99	7.99	31.67	7.80	7.89	8.08	5.95	29.73	6.15	6.24	6.31	5.95	24.65		
T & D Loss ²	53.46	44.88	187.63	37.98	49.51	51.19	43.59	182.27	45.67	44.60	48.85	44.76	183.88		
Total Consumption (sales) ..	551.43	494.17	2085.25	520.48	494.22	601.87	524.16	2140.73	550.30	534.10	592.47	540.40	2217.28		

¹Includes wood and waste.

²Transmission and distribution losses through the power network, calculated as total generation plus net imports 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(83/11), and Electric Power Monthly DOE/EIA-0226(83/09).

Table 18. Quarterly Supply and Disposition of Total Energy
(Quadrillion Btu)

	History						Projections						
	1982			1983			1984			1984			
	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year
Supply													
Production													
Petroleum ¹	5.17	5.20	20.53	5.08	5.12	5.18	5.16	20.55	5.10	5.07	5.10	5.09	20.35
Natural Gas ²	4.33	4.32	18.02	4.19	3.82	3.93	4.22	16.16	4.33	4.24	4.24	4.42	17.23
Coal	4.51	4.43	18.76	4.28	4.16	4.47	4.69	17.60	4.50	4.68	5.07	4.53	18.79
Nuclear	0.83	0.77	3.08	0.78	0.75	0.83	0.79	3.15	0.83	0.77	0.92	0.89	3.41
Hydroelectric ³	0.75	0.74	3.25	0.92	0.96	0.79	0.73	3.41	0.82	0.83	0.70	0.68	3.03
Geothermal and Other ⁴	0.03	0.03	0.11	0.03	0.03	0.04	0.04	0.14	0.04	0.03	0.04	0.04	0.15
Subtotal	15.61	15.50	63.75	15.27	14.84	15.26	15.64	61.00	15.61	15.62	16.08	15.64	62.96
Net Imports													
Crude Oil	1.97	1.75	6.90	1.21	1.65	2.10	1.95	6.91	1.96	2.25	2.36	2.35	8.91
Other Petroleum	0.53	0.55	2.12	0.35	0.51	0.71	0.62	2.20	0.56	0.51	0.60	0.52	2.29
Natural Gas (Dry)	0.19	0.25	0.89	0.27	0.17	0.15	0.26	0.84	0.26	0.20	0.19	0.26	0.90
Liquefied Natural Gas	-0.00	0.01	0.01	0.03	0.03	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.05
Coal and Coke	-0.66	-0.62	-2.79	-0.39	-0.53	-0.57	-0.54	-2.03	-0.39	-0.54	-0.53	-0.57	-2.04
Electricity	0.08	0.08	0.33	0.08	0.08	0.08	0.06	0.31	0.06	0.06	0.07	0.06	0.26
Subtotal	2.10	2.03	7.46	1.55	1.91	2.48	2.37	8.31	2.57	2.49	2.70	2.62	10.38
Primary Stocks													
Net Withdrawals	-1.20	0.18	-0.06	1.47	-0.30	-0.92	0.39	0.64	1.27	-0.66	-1.15	0.22	-0.33
SPR Fill Rate Additions(-)	-0.08	-0.09	-0.37	-0.10	-0.12	-0.17	-0.12	-0.51	-0.10	-0.12	-0.05	-0.08	-0.35
Utility Stocks⁵													
Net Withdrawals	0.18	-0.09	-0.14	0.18	-0.10	0.53	-0.01	0.60	0.22	-0.14	-0.24	0.31	0.15
Total Supply⁶	16.62	17.53	70.64	18.36	16.24	17.17	18.27	70.04	19.56	17.21	17.34	18.72	72.81
Consumption													
Nonutility Uses													
Petroleum	7.08	7.25	28.85	6.96	6.99	7.20	7.51	28.65	7.48	7.39	7.44	7.73	30.05
Natural Gas ⁷	2.49	3.93	14.98	4.78	2.97	2.28	3.97	13.99	4.93	3.02	2.40	4.12	14.47
Coal	0.66	0.69	2.87	0.69	0.66	0.69	0.81	2.84	0.60	0.73	0.75	0.82	3.10
Subtotal	10.23	11.87	46.69	12.43	10.61	10.16	12.28	45.48	13.21	11.15	10.59	12.66	47.62
Electric Utility Inputs													
Petroleum	0.38	0.33	1.57	0.40	0.33	0.43	0.37	1.54	0.47	0.35	0.43	0.38	1.63
Natural Gas	1.04	0.74	3.34	0.61	0.69	1.00	0.75	3.06	0.65	0.81	0.97	0.72	3.15
Coal	3.34	3.06	12.52	3.08	2.95	3.76	3.27	13.06	3.45	3.26	3.66	3.43	13.80
Nuclear	0.83	0.77	3.08	0.78	0.75	0.83	0.79	3.15	0.83	0.77	0.92	0.89	3.41
Hydroelectric ⁸	0.83	0.83	3.58	1.00	1.05	0.88	0.80	3.72	0.89	0.89	0.77	0.74	3.29
Geothermal and Other	0.03	0.03	0.11	0.03	0.03	0.04	0.04	0.14	0.04	0.03	0.04	0.04	0.15
Subtotal	6.45	5.75	24.20	5.91	5.78	6.95	6.02	24.66	6.31	6.13	6.80	6.19	25.42
Gross Energy Consumption⁶	16.68	17.62	70.89	18.34	16.40	17.11	18.31	70.14	19.52	17.27	17.39	18.85	73.04
Electric Utility Adjustments													
Conversion Loss ⁹	4.57	4.07	17.07	4.13	4.09	4.89	4.23	17.34	4.43	4.30	4.77	4.35	17.85
Total Net Energy	12.11	13.57	53.82	14.27	12.34	12.25	14.08	52.94	15.01	13.06	12.53	14.69	55.29
Unaccounted for	-0.06	-0.10	-0.25	0.02	-0.16	0.06	-0.04	-0.10	0.04	-0.06	-0.05	-0.13	-0.23
Total Disposition	16.62	17.53	70.64	18.36	16.24	17.17	18.27	70.04	19.56	17.21	17.34	18.72	72.81

SPR = Strategic Petroleum Reserve.

¹Includes crude oil and lease condensate; natural gas liquids; hydrogen, etc., input to oil refineries.

²Dry marketed natural gas excluding nonhydrocarbon gases removed.

³Includes industrial production.

⁴Includes wood and waste used to generate electricity.

⁵Includes all secondary coal stocks.

⁶This total excludes approximately 2 quadrillion Btu of wood.

⁷Includes natural gas used as refinery fuel.

⁸Includes industrial hydroelectric production and net imports of electricity.

⁹Includes 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(83/11), and Electric Power Monthly DOE/EIA-0226(83/09).

See note above.

4.1

Energy Information Administration
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Forecast Conversion Factors Used in STIFS

Most of the conversion factors used by the Short-Term Integrated Forecasting System (STIFS) are the 1982-1983 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	