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Short-Term Energy Outlook



Volume 1—Quarterly Projections

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Preface

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 quarterly projections. Methodology volumes, which are published with the May and November issues, 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. This quarter's projections extend through the second quarter of 1984.

The forecasts are produced using the Short-Term Integrated Forecasting System (STIFS). Two principal driving variables are used in the STIFS model: the macroeconomic forecast and the world oil price assumptions. The macroeconomic forecast, which is produced by Data Resources, Inc. (DRI) is 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 world oil price scenarios. In general, the following discussion of the forecast refers to the medium price, or base case, scenario. Forecasts for alternative cases, using varying assumptions about the level of economic activity, new-car efficiency, weather, stock change, and preliminary data uncertainty, are included for petroleum demand and oil imports.

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

The base case projection for petroleum is summarized in Table 1. Tables 4, 5, and 7 through 18 appear at the end of the text.

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1. Highlights

World oil consumption is projected to decline in 1983 for the 4th consecutive year. Despite reduced petroleum production by members of the Organization of Petroleum Exporting Countries (OPEC), weak worldwide demand for petroleum and increased production by non-OPEC countries has put downward pressure on oil prices. As a result, OPEC lowered its official price for Saudi marker crude oil to \$29 per barrel in March. The recent declines in world petroleum consumption are projected to end during the second half of 1983 as economic growth resumes in the industrialized countries.

In view of the recent firmness in the world petroleum market, it is projected that petroleum prices will stabilize near current levels. In the base case forecast, the price of imported crude oil to U.S. refiners is assumed to remain at its current level of an estimated \$29.43 per barrel through mid-1984.

The U.S. economic recovery that began slowly in the first quarter of 1983 is projected to continue through mid-1984. Gross National Product (GNP) is projected to rise by 2.5 percent from 1982 to 1983, then be 4.9 percent above year-earlier levels in the first half of 1984 according to Data Resources, Incorporated (DRI).

The base case forecast for this Outlook (see Table 1) is as follows:

- Declining U.S. petroleum consumption is projected to bottom out in 1983 and then to begin rising again through the first half of 1984. Consumption in 1983 is projected to average 15.1 million barrels per day, slightly lower (1.2 percent) than that registered in 1982. However, most of this decline can be attributed to the extremely mild weather experienced this past winter and continuing conservation on the part of consumers. Based on the assumptions of continued economic recovery and a return to normal weather, consumption in the first half of 1984 is projected to increase by about 6 percent above year-earlier levels.
- As the result of a projected slight decline in domestic crude oil production and the end of the last 2 years' large withdrawals from primary petroleum inventories:
 - Net oil imports in 1983 are projected to be 4.3 million barrels per day, up slightly from 1982. Total 1983 oil imports, measured on a balance-of-payments basis, are forecast to cost \$54.3 billion, about 11 percent less than in 1982, primarily because of the projected decline in the average cost of imported crude oil.
 - In the first half of 1984, net oil imports are forecast to be 5.1 million barrels per day, 41 percent above year-earlier levels.

Table 1. Summary of Base Case Petroleum Projections

Forecast Variable	Million Barrels per Day (percent change from prior year)				
	History		Projections		
	1981	1982	Full Year	1983	First Half 1984
Petroleum Consumption					
Motor Gasoline	6.59	6.54	6.43	6.43	6.20
	(0.1)	(-0.8)	(-1.7)	(-0.9)	(-3.6)
Distillate Fuel Oil ^a	2.83	2.67	2.67	2.60	3.05
	(-1.3)	(-5.7)	(0.0)	(-10.2)	(17.3)
Residual Fuel Oil ^a	2.09	1.70	1.61	1.54	1.89
	(-16.7)	(-18.7)	(-5.3)	(-17.6)	(22.7)
Total Petroleum ^b	16.06	15.25 ^c	15.08	14.81	15.69
	(-5.8)	(-5.0)	(-1.2)	(-4.6)	(5.9)
Net Imports ^d	5.40	4.23	4.26	3.58	5.05
	(-15.1)	(-21.7)	(0.7)	(-10.1)	(41.1)
Crude Oil Production	8.57	8.67	8.65	8.67	8.57
	(-0.3)	(1.2)	(-0.2)	(0.2)	(-1.1)
 Billion 1972 Dollars (percent change from prior year)					
Gross National Product	1,503	1,477	1,513	1,495	1,569
	(2.0)	(-1.7)	(2.5)	(1.4)	(4.9)
 Nominal Dollars per Barrel (percent change from prior year)					
Average Cost of Imported Crude Oil	37.05	33.55	29.62	29.82	29.43
	(9.3)	(-9.4)	(-11.7)	(-12.5)	(-1.3)

^aBecause of changes in EIA reporting beginning January 1983, crude oil burned as fuel on leases and by pipelines is no longer reported as distillate or residual fuel oil consumption. Prior to January 1983, reported distillate fuel oil consumption included about 10,000 barrels per day of crude oil, and reported residual fuel oil consumption included about 50,000 barrels per day of crude oil. (See the Petroleum Supply Reporting System overview in the March 1983 Petroleum Supply Monthly for additional information.)

^bTotal product supplied including "other" petroleum products.

^cMinor discrepancy (of 0.01) in this total with that shown in Tables 7-9 is due to rounding.

^dIncludes Strategic Petroleum Reserve.

Sources: Energy Information Administration, 1981 Petroleum Supply Annual DOE/EIA-340(81/2), and Petroleum Supply Monthly DOE/EIA-0109(83/04).

Historical data for March 1983 are preliminary.

- From 1982 to 1983, the consumption of each major petroleum product is projected to remain essentially unchanged with only residual fuel oil showing any significant percentage decline (5 percent). However, by the first half of 1984, the assumed economic recovery and return to normal weather are projected to cause the consumption of all major categories of petroleum products--with the exception of motor gasoline--to be above year-earlier levels.
 - Motor gasoline consumption in 1983 is projected to equal 6.4 million barrels per day, which is about the same as the 1982 level of 6.5 million barrels per day. Despite declining retail gasoline prices and a growing economy, the effects of continued increases in the efficiency of the motor vehicle stock are expected to result in slightly lower consumption of this fuel.
 - Distillate fuel oil consumption is projected to remain unchanged at the 1982 level of 2.7 million barrels per day in 1983. The improving economy and significantly lower real retail prices are forecast to bring distillate fuel oil consumption above year-earlier levels beginning in the second half of 1983. Consumption has been depressed by the unusually mild weather experienced in the first half of 1983.
 - Residual fuel oil consumption is projected to fall to 1.6 million barrels per day in 1983, about 5 percent below the 1982 level. The use of this fuel is forecast to rise and be above year-earlier levels for both utility and nonutility consumers from the third quarter of 1983 through the first half of 1984.
- Natural gas consumption in 1983 is projected to be 17.2 trillion cubic feet--3.5 percent lower than in 1982 and the lowest level since 1966. In the first half of 1984, as the economy continues to recover and normal weather is assumed to return, natural gas consumption is projected to be about 8 percent above year-earlier levels. A further decline in gas production, of about 5 percent, to 16.7 trillion cubic feet, is projected for 1983, with production 4 to 5 percent above year-earlier levels in the first half of 1984. Primarily because of a significant increase in liquefied natural gas imports, 1983 gas imports are projected to be over 1 trillion cubic feet. Imports in 1983 are expected to account for about 6 percent of U.S. natural gas consumption, up from 5 percent in 1982. The price of natural gas is projected to rise more rapidly than the price of any other form of energy, with 1983 prices to residential users averaging more than 16 percent above year-earlier levels.

- Domestic coal consumption is forecast to rise slightly (by 1 percent) from 1982 to 1983, due to a rise in electric utility consumption. Coal exports are projected to drop by 15 percent from 1982 to 1983, primarily because of the weak world economy and additional competition from exports by Poland, Australia, and South Africa. 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 about 6 percent, to 787 million tons, in 1983. All categories of coal consumption, together with exports, are projected to accelerate in early 1984, leading to coal production that is about 10 percent above year-earlier levels in the first half of 1984.
- Electric utility generation is projected to be below year-earlier levels during the first half of 1983. Preliminary data that became available after this projection was made indicate that this decline could exceed 2 percent. Much of this decline is attributable to the mild weather experienced in the first quarter of 1983. Based on the normal relationship between economic growth and electricity generation, generation in the second quarter of 1983 is projected to be about 3 percent higher than in the second quarter of 1982. However, preliminary data indicate that electricity generation in the second quarter of 1983 could be about the same as year-earlier levels.

Because of the assumed economic recovery and return to normal weather, electric utility generation is projected to be more than 5 percent over year-earlier levels in the last half of 1983. This implies that total generation for the year could be as much as 1 to 2 percent over the 1982 level. If the industrial demand for electricity fails to pick up as the economy recovers (perhaps indicating some structural change or stringent efficiency measures) or if summer weather is abnormally cool (as it was in 1982), electricity generation could be lower than the levels forecast below. Although this level of generation marks a recovery from the decline that was experienced from 1981 to 1982, total 1983 generation is still projected to be below the 1981 level.

- Increases from 1982 to 1983 are projected for generation from coal, natural gas, nuclear power, and hydroelectric power while petroleum-fired generation is forecast to decline slightly.
- Hydroelectric generation in 1983 is expected to remain well above normal levels as the result of heavy precipitation in the West.
- The projected 3.9-percent 1982 to 1983 increase in nuclear-powered generation, to 294 billion kilowatt-hours and 12.8 percent of total generation in 1983, would set new records.

Total U.S. energy consumption in 1983 is projected to be 70.7 quadrillion Btu, almost the same as the 70.8 quadrillion Btu consumed in 1982 (Table 2). This small change in total energy consumption includes about a half-quadrillion-Btu decline in oil and gas consumption partially offset by slight increases in the consumption of coal and nuclear power.

The energy intensity of U.S. economic activity is projected to decline to 46,700 Btu per 1972 dollar of GNP in 1983. This represents a drop of 2.6 percent from 1982, continuing the trend of declining annual Btu/GNP ratios that began in 1970.

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

Energy Source	History				Projections
	1979	1980	1981	1982	1983
Petroleum	37.1	34.2	31.9	30.3	30.0
Natural Gas	20.7	20.4	19.9	18.4	18.2
Coal ^a	15.2	15.4	16.0	15.4	15.6
Nuclear Power	2.7	2.7	3.0	3.1	3.2
Hydroelectricity ^b	3.1	3.1	3.1	3.6	3.5
Geothermal and Other	0.1	0.1	0.1	0.1	0.1
Gross Energy Use	78.9	76.0	74.0	70.8	70.7

^aIncludes net imports of coal coke.

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

Source: Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(83/05), and Electric Power Monthly, DOE/EIA-0226(83/03). Historical data for March 1983 are preliminary.

It should be noted that the forecast given above is this Outlook's base case forecast. Additional cases for petroleum, based on alternative oil prices and economic growth rates, are included in the report. Should the imported crude oil prices, economic growth, and weather conditions 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 would increase by 140,000 barrels per day (approximately 0.9 percent and 2.7 percent, respectively).
- For each \$1-per-barrel (approximately 3.4 percent) decline in the price of imported crude oil, petroleum consumption and total imports would increase by 120,000 barrels per day (approximately 0.8 percent and 2.4 percent, respectively).
- For each 10-percent increase in heating degree-days during the first and fourth quarters, petroleum consumption and total imports would increase by an average of 260,000 barrels per day (approximately 1.7 percent and 5.4 percent, respectively).
- For each 10-percent increase in cooling degree-days during the second and third quarters, petroleum consumption and total imports would increase by an average of 100,000 barrels per day (approximately 0.7 percent and 1.9 percent, respectively).

2. The Outlook

Forecast Assumptions

World Oil Prices

For the base case projections in this Outlook, the price of crude oil delivered to U.S. refiners is assumed to stabilize at its April 1983 level of \$29.43 per barrel. The downward pressure on crude oil prices during the last 2 years has been caused by declining demand in a generally depressed world economy, the drawdown of inventories and resulting lower imports in major consuming countries, and additional oil production, particularly in non-OPEC countries. However, these factors are expected to be less important during the next year.

In the base case, level nominal crude oil prices through the first half of 1984 are assumed because:

- Recent attempts at restraining OPEC crude oil production are assumed to succeed to the extent that they prevent a major surge of additional crude oil production and a resulting price war.
- World economic growth is projected to resume during 1983 and 1984 with the result that oil consumption increases from recent levels.
- The apparent large drawdowns of petroleum inventories in the importing countries during the last 2 years are projected to end during 1983 and further contribute to the demand for oil on the world market.

For this Outlook, the world crude oil price cases, in nominal U.S. dollars, are as follows:

Low = As a result of a weak market, oil prices continue to deteriorate and fall to an effective OPEC marker price of \$25 per barrel by the beginning of the third quarter of 1983. Price differentials for other crudes remain at present levels. Prices then remain level for the remainder of the forecast period.

Base = Prices remain constant at estimated April levels.

High = Prices rise at 2 times the U.S. rate of inflation.

Macroeconomic Outlook

The economic recovery that began slowly in the first quarter of 1983 is projected to accelerate, then slow somewhat in 1984. Real Gross National Product (GNP) is forecast to rise by 2.5 percent between 1982 and 1983 and to be 4.9 percent above year-earlier levels in the first half of 1984 (Table 3).

This macroeconomic forecast is based on the Data Resources, Inc. (DRI) CONTROL forecast of April 1983. The levels of GNP and rates of economic growth are higher than those used as a basis for forecasts in the February 1983 Outlook for all forecast quarters.

The levels of real disposable personal income (RDPI) and the index of manufacturing production are also projected to be higher than forecast in February 1983. RDPI is projected to continue to increase more rapidly than GNP. Manufacturing activity, which declined by 8.5 percent between 1981 and 1982 and is more sensitive to changes in the economy than GNP, is forecast to rise by 3.3 percent between 1982 and 1983, then to be 8.1 percent above year-earlier levels in the first half of 1984. Inflation, as measured by the GNP deflator, was 5.9 percent between 1981 and 1982 and is projected to be 4.6 percent between 1982 and 1983. (Assumptions pertaining to weather are given in Table 3.)

Energy Product Prices

Projections for petroleum product prices follow the declining price of crude oil between 1982 and 1983 (Table 4). By the second quarter of 1984, the prices of petroleum products are projected to be slightly above year-earlier levels, as the economy continues to grow, petroleum consumption rises relative to projected inventories, and the margins between the crude oil prices paid by refiners and retail prices rise from their recent low levels. The prices of energy products other than petroleum are projected to be above year-earlier levels throughout the forecast period, with the most rapid rise occurring in natural gas.

Despite the 5-cent-per-gallon increase in the Federal tax on gasoline that went into effect on April 1, motor gasoline prices in 1983 are projected to average 5 percent below prices in 1982. Motor gasoline prices are projected to rise throughout 1983, then decline slightly in both the first and second quarters of 1984.

Retail heating oil prices are forecast to decline by an average of 7.8 percent between 1982 and 1983, then rise to 2.6 percent above year-earlier levels in the second quarter of 1984. During the next heating season (the fourth quarter of 1983 and first quarter of 1984), retail heating oil prices are projected to average about 5 percent below year-earlier levels.

Retail residual fuel oil prices are projected to decline by about 4 percent between 1982 and 1983. In the first half of 1984, the average price is projected to be 2.6 percent above year-earlier levels as the price differential between residual fuel oil and natural gas narrows and the economy continues to improve, thereby increasing the demand for this fuel.

The average price of natural gas to residential users is projected to increase by 16.6 percent between 1982 and 1983, and then to average 11.6 percent above year-earlier levels in the first half of 1984.

Residential electricity prices are projected to increase about as rapidly as the inflation rate measured by the GNP deflator. Residential electricity prices in 1983 are forecast to average 4.8 percent above year-earlier levels.

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

Assumptions	History										Projections						
	1980		1981		1982						1983		1984				
	Year	Year	1st	2nd	3rd	4th	Year	1st	Price	2nd	3rd	4th	Year	1st	2nd		
Macroeconomic																	
(billion 1972 dollars)																	
Real Gross National Product ^a	1,474	1,503	1,471	1,478	1,481	1,477	1,477	1,489	Low	1,502	1,523	1,543	1,514	1,563	1,583		
Percent Change from Prior Year	-0.3	2.0	-2.5	-1.6	-1.9	-0.9	-1.7	1.2	Base	1,502	1,522	1,540	1,513	1,560	1,578		
GNP Implicit Price Deflator (Index, 1972=100)	178.6	195.5	203.7	206.0	208.5	210.4	207.1	213.4	High	1,502	1,521	1,539	1,513	1,557	1,575		
Percent Change from Prior Year	9.3	9.4	7.2	6.6	5.6	4.4	5.9	4.8	Low	215.6	217.4	219.7	216.5	222.1	224.5		
Real Disposable ^b									Base	215.6	217.5	220.0	216.7	222.7	225.4		
Personal Income	1,018	1,043	1,047	1,055	1,058	1,059	1,055	1,064	High	215.7	217.6	220.2	216.7	223.0	225.9		
Percent Change from Prior Year	0.2	2.5	1.1	1.8	0.9	0.7	1.1	1.6	Low	4.7	4.3	4.4	4.5	4.1	4.1		
Index of Industrial Production (MFG)	146.7	150.3	139.8	138.1	137.7	134.5	137.5	137.7	Base	4.7	4.3	4.6	4.6	4.4	4.5		
Percent Change from Prior Year	-4.5	2.4	-7.6	-9.4	-9.7	-7.2	-8.5	-1.5	High	4.7	4.3	4.6	4.6	4.5	4.7		
Oil Price																	
(U.S. nominal dollars/barrel)																	
Imported Crude Oil Prices ^c	33.89	37.05	35.03	33.13	33.14	33.07	33.55	30.20	Low	28.76	26.76	25.43	27.79	25.43	25.43		
U.S. Refiners' Cost ^d	28.07	35.24	33.05	31.20	31.53	31.78	31.87	29.61	Base	29.43	29.43	29.43	29.62	29.43	29.43		
Weather ^e	(number of degree days)										High	29.69	30.45	31.28	30.41	32.18	33.06
Heating Degree Days	4,857	4,653	2,542	600	105	1,507	4,754	2,160	Low	28.33	26.46	25.21	27.40	25.19	25.20		
Cooling Degree Days	1,281	1,168	36	294	702	65	1,097	26	Base	28.96	28.98	28.98	29.13	29.95	28.96		
									High	29.20	29.95	30.73	29.87	31.54	32.37		

^aMacroeconomic projections from three DRI model forecasts are seasonally adjusted at annual rates, and modified as appropriate to the three world oil price cases.

^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: Energy Information Administration, *Monthly Energy Review* DOE/EIA-0035(83/05), Bureau of Economic Analysis, U.S. Department of Commerce, *National Income and Product Accounts*, as revised, April 1983; National Oceanic and Atmospheric Administration, U.S. Department of Commerce, *State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population*, March 1983; and the Federal Reserve System, *Data Release G.12.3*, April 1983. Macroeconomic forecasts based on modifications to Data Resources, Inc., forecasts CONTROL 042583.

This projected deceleration in the rate of growth of electricity prices is due to lower increases in the cost of coal and natural gas to electric utilities, a decline in residual fuel oil prices, and the effects of lower interest rates on this capital-intensive industry.

World Petroleum Situation

During the first half of 1983, the world demand for oil continued to be very weak as the Organization for Economic Cooperation and Development (OECD) countries slowly recuperated from an estimated 0.4-percent decline in economic activity during 1982. This weakness follows 3 consecutive years of declining oil consumption and drawdowns of world oil stocks. In addition, supplies from the Centrally Planned Economies and other countries have been gradually increasing. These trends have created strong pressures on oil-exporting countries to discount their sales prices. Many analysts questioned whether OPEC could continue to function as a cartel. In March, the members of OPEC decided on a restructured set of lower oil prices with the Saudi Arabian marker crude set at \$29 per barrel. In addition, new crude oil production quotas were set with an overall ceiling of 17.5 million barrels per day. Since March, the widespread practice of offering oil at a discount from official prices appears to have stopped in most OPEC countries. As a further indication of market firmness, recent spot market crude oil prices have been only slightly lower--usually by no more than \$1 per barrel--than official sale prices.

Oil prices are projected to remain at the April 1983 level throughout the forecast period. Table 5 summarizes the international petroleum outlook for the remainder of 1983 and the first half of 1984. World oil inventories are expected to be further reduced during 1983 to 4.3 billion barrels. Petroleum supplies, the sum of production in non-Communist countries and net Communist exports, are projected to total 43.7 million barrels per day during 1983, down by 0.7 million barrels per day from 1982.

Non-Communist world petroleum production in 1982 was 42.9 million barrels per day. This was a reduction of 2.6 million barrels per day from 1981 and reflected the influence of declines in oil consumption and drawdowns of oil inventories. This pattern has continued during the first half of 1983. However, these trends are expected to end during the second half of 1983 when world oil production is projected to be slightly more than 1.0 million barrels per day higher than in the second half of 1982. For the full year of 1983, the projections show a decline in non-Communist oil production of 0.7 million barrels per day accompanied by a 0.6-million-barrel-per-day decline in consumption and a further drawdown of oil stocks at a rate of 1.3 million barrels per day.

World oil consumption in 1983 is projected to decline for the 4th consecutive year. However, the persistent declines in oil demand are expected to end during the second half of 1983 as economic growth in the industrial countries begins to increase these countries' requirements for petroleum. The outlook is for a resumption of economic growth with an overall increase of Gross Domestic Product (GDP) in the OECD countries of 1.6 percent in 1983. Table 6 gives growth rates for the OECD and its major components.

Table 6. International Economic Growth

Region	Annual Average 1970-1981	1982 ^{a b}	1983 ^{a b}
OECD Total ^c	3.1	-0.4	1.6
United States ^d	3.0	-1.7	2.5
Western Europe ^c	2.7	0.3	0.4
Japan ^c	4.7	3.0	3.1
Other ^e	3.7	-2.9	1.0

^aPreliminary estimates.

^bYear-to-year rate of change.

^cGDP.

^dGNP.

^eCanada, Australia, and New Zealand.

Source: Organization of Economic Cooperation and Development, Main Economic Indicators, May 1983 and Economic Outlook, December 1982. Bureau of Economic Analysis, U.S. Dept. of Commerce, Survey of Current Business, July 1982. Wharton Econometric Forecasting Associates, World Economic Outlook, Pre-Meeting Forecast, May 1983.

During 1982 and 1983, the decline in world oil consumption has been accompanied by large drawdowns of oil stocks. These major declines are projected to end in the second half of 1983. The lowered inventory levels may cause concern whether end-of-1983 stocks are likely to be adequate for anticipated requirements. However, the projected inventory level of 4.3 billion barrels at the end of 1983 would provide an estimated 91 days of oil supply. This is higher than the estimated 85 days of supply at the outbreak of the Iranian revolution near the end of 1978, a time of growing international oil consumption. Moreover, the current surplus in sustainable production capacity and low refinery utilization rates around the world should ensure that international oil stocks will be sufficient for 1984.

U.S. Petroleum Outlook

Overview

Declining U.S. petroleum consumption is projected to bottom out in 1983 and then to begin rising again through the first half of 1984. Consumption in 1983 is projected to average 15.1 million barrels per day, slightly lower (1.2 percent) than that registered in 1982. The consumption of each major petroleum product is projected to remain essentially unchanged between 1982 and 1983 with only residual fuel oil showing any significant decline (5 percent). (See Table 7 for the base case projection; alternative price cases are given in Tables 8 and 9.) The slight decline in total consumption reflects the effects of a 4.9-percent decline in petroleum consumption between the first quarters of 1982 and 1983 (in large part the result of mild weather in early 1983) that are not fully offset by the effects of a projected 2.5 percent year-to-year rise in GNP and a 6.6-percent decline in the average cost of crude oil to U.S. refiners. (The sensitivity of total petroleum consumption to uncertainty about economic

activity, weather, and new-car efficiency is shown in Table 10.) Net petroleum imports in 1983 are projected to be 4.3 million barrels per day, 0.7 percent above the 1982 level.

Based on the assumptions that the economy will grow by 4.9 percent between the first halves of 1983 and 1984, that nominal crude oil prices will remain at April 1983 levels, and that normal weather will return over the forecast period, total petroleum consumption is projected to rise by 5.9 percent. Over this period, consumption of all major product categories, with the exception of motor gasoline, is projected to increase. Petroleum imports are projected to increase sharply.

Crude oil inputs to refineries declined from 12.5 million barrels per day in 1981 to 11.8 million barrels per day in 1982. However, refinery capacity utilization in 1982 averaged slightly less than 70 percent (marginally higher than in 1981) because of the closing of some older and less-efficient refineries. Between early 1981 and the end of 1982, operable refinery capacity declined by about 8.6 percent, from 18.6 to 17.0 million barrels per day.

Domestic Petroleum Production

Domestic crude oil production in 1983 is projected to fall to 8.65 million barrels per day, 20,000 barrels per day (0.2 percent) below the 1982 level. Alaskan North Slope production is projected to rise slightly, while Lower-48-States' production declines. Much of the recent slowdown in the decline of petroleum production in the Lower-48 States is attributed to the acceleration of withdrawals of reserves in older producing areas, rather than to the discovery of significant new reserves. Between the first half of 1983 and first half of 1984, total U.S. production of crude oil is projected to decline by 1.1 percent.

Exploration and development activity has been slowed by the decline in the price of crude oil since early 1981 together with high real interest rates. Although the reported number of oil well completions during 1982 was 7 percent above the 1981 level, monthly oil well completions fell below year-earlier levels in August 1982 and averaged 9.5 percent below year-earlier levels in the first 2 months of 1983. The total number of rotary rigs in operation peaked in December 1981 and has been below year-earlier levels since April 1982. Total oil and gas well completions and dry wells drilled have been below year-earlier levels since September 1982. The total number of crews engaged in seismic exploration peaked in September 1981 and declined almost continuously through March 1983, when it was 31 percent below year-earlier levels.

Petroleum Inventories

Throughout the forecast period, seasonal changes in petroleum product stocks are projected to be slightly less pronounced than in the past. This is a response to lower-than-historic levels of product demand and the expectation of stable or declining petroleum prices which avoids extremely low levels of stocks for individual products (Table 11). In terms of both total inventories and days' supply, stocks are projected to be lower than during the period of unusually high inventories that followed the major increase in petroleum prices in 1979. A comparison of projected end-of-1983 stocks with year-earlier levels (in terms of days' supply at the prior year's rate of product supplied) is as

follows: motor gasoline, 30 days, down from 31 days; distillate fuel oil, 64 days, down from 70 days; and residual fuel oil, 34 days, down from 40 days. Seasonal swings in total petroleum inventories are expected to continue to be dominated by product stocks while crude oil inventories decline slightly during 1983.

The projection of crude oil fill rates for the Strategic Petroleum Reserve (SPR) is based on SPR crude oil requirements and projected deliveries to support permanent SPR capacity development. The fill rate realized after the third quarter of 1983 will, however, depend on the availability of funding as determined by the Fiscal Year 1984 budget.

Petroleum Imports

Net petroleum imports are already rising from the very low 3.02 million-barrel-per-day level that was reached in the first quarter of 1983. During 1983, net petroleum imports are projected to be 4.26 million barrels per day, 0.7 percent above the 1982 level, primarily as a result of small year-to-year declines in both domestic production and withdrawals from primary inventories. In the first half of 1984, net imports are projected to average more than 5.0 million barrels per day, 41 percent above year-earlier levels. In 1982, net petroleum imports fell to 4.23 million barrels per day, down 22 percent from 1981 and at the lowest level since 1971.

Between 1981 and 1982, petroleum imports from OPEC countries dropped from 55 percent to 42 percent of total imports. In 1982, Mexico was the largest single source of petroleum imports to the United States, followed by Saudi Arabia and Nigeria. Saudi Arabia and Nigeria had been the largest sources of petroleum imported to the United States between 1975 and 1981.

Total oil imports in 1983, measured on a balance-of-payments' basis, are projected to cost \$54.3 billion, 11.2 percent less than in 1982. This is a significantly smaller decline than the 21-percent drop in the cost of petroleum imports between 1981 and 1982, when oil imports cost \$61.2 billion. If the economic recovery continues as forecasted, imports in the first half of 1984 are projected to cost \$31.3 billion, up about 32 percent from year-earlier levels. (The total cost of oil imports on a balance of payments' basis is the cost of oil delivered alongside ship at the exporting countries, so that the cost of transportation to the United States is not included. Gross imports include both crude oil and products delivered to the 50 States, U.S. territories, and the Strategic Petroleum Reserve.)

Motor Gasoline

During the first quarter of 1983, motor gasoline supplied was 1.3 percent above year-earlier levels. Much of this first-quarter increase took place during March, when the level of gasoline supplied was higher than in any of the summer months of 1982. This spurt was probably caused by a building of secondary and tertiary gasoline stocks prior to the April 1, 1983 increase in the Federal gasoline tax. This secondary and tertiary stock build is estimated to have accounted for about 500,000 barrels per day of gasoline supplied at the end of March.

Preliminary Federal Highway Administration data for the first quarter of 1983 show a 4.7-percent increase in total motor vehicle travel over year-earlier levels; warmer-than-normal weather in January and February, historically low travel months, probably contributed to this increase. In 1983, vehicle-miles for gasoline-powered passenger cars are projected to increase by almost 5 percent over 1982 levels. However, this increase in travel is not expected to lead to a significant increase in gasoline consumption. Gasoline consumption is forecast to average 6.43 million barrels per day in 1983, a slight decline from 1982 (Table 12). Year-to-year changes in many of the other determinants of gasoline demand would seem likely to stimulate an increase in gasoline consumption in 1983: between 1982 and 1983, the real fuel cost per mile of travel is projected to fall by over 14 percent, and both industrial production and consumers' income are expected to increase by about 3 percent. However, the demand-increasing effects of these factors are projected to be more than offset in 1983 by a forecast 7.4-percent increase in the average automobile stock fuel efficiency to cause the expected slight decrease in gasoline consumption. Some of the increase in auto stock efficiency is based on an expected 10-percent increase in new car sales during 1983, as projected by Data Resources, Incorporated (DRI). Additionally, the forecast 7.4-percent increase in fuel efficiency, which is based on preliminary data for 1982, could be revised when final data are available.

Gasoline consumption during the first half of 1984 is forecast to be 3.5 percent below year-earlier levels at an average of 6.21 million barrels per day. With the exception of average auto fuel efficiency, all the demand determinants used to forecast 1984 gasoline consumption indicate an increase in demand. The real fuel cost per mile is expected to continue to fall, unemployment to decrease, and consumers' income and industrial production to rise. However, while these factors are projected to result in another 4-percent increase in passenger car travel during the first half of 1984, the forecast increase in average auto fuel efficiency of 4.7 percent is expected to outweigh the effects of the demand-stimulating factors and result in a decrease in gasoline consumption.

Distillate Fuel Oil

Preliminary data indicate that the winter of 1982-1983 was the warmest in the last 30 years, with population-weighted heating degree days running about 10 percent below normal. During the first quarter of 1983, distillate fuel oil supplied was 2.83 million barrels per day, a decrease of 10.4 percent from the first quarter of 1982. About three-fifths of the decrease is estimated to have been due to the warmer weather, with the rest attributed to lower industrial production, increased conservation efforts, and, perhaps, a decrease in secondary stock levels.

Due to a warmer-than-normal first quarter, total distillate demand in 1983 is projected to average 2.67 million barrels per day, the same as in 1982 (Table 13). The effects of lower prices, higher industrial production, and assumed normal weather during the last 3 quarters of the year are expected to offset the abnormally low demand experienced during the first quarter of 1983. While the assumption used for the base case is always normal weather, a 10-percent colder or warmer-than-normal first quarter is estimated to add or subtract about 150,000 barrels per day from the base case forecast for the quarter. For

the year, heating oil prices in real terms are projected to decline about 11 percent, industrial production is forecast to increase about 5 percent, and the assumed level of heating degree days is about 6 percent below last year's levels.

A breakout of the 1983 distillate forecast by end-use sector shows a decrease of about 30,000 barrels per day in heating and industrial demand (primarily because of the abnormally warm first quarter) and an increase of only about 10,000 barrels per day in both diesel fuel oil demand and shipments to electric utilities.

An assumed substantial increase in industrial production (8 percent over year-earlier levels) and normal heating degree days are the basis for projecting a significant increase in distillate demand for the first half of 1984. Consumption for this period is projected to be 3.05 million barrels per day, a 17-percent increase over the first half of 1983.

Availability of distillate fuel oil, particularly for diesel use during the summer driving season, does not appear to be a major concern at this time. While closing first-quarter stocks were more than 9 million barrels below the year-earlier level, considerable refinery capacity remains available should additional runs be necessary. Crude oil stocks, while below last year's levels, continue to be high relative to refinery runs. In addition, the continuing glut of crude oil implies ready availability of spot market purchases of both crude oil and product if necessary.

Residual Fuel Oil

Residual fuel oil consumption has dropped sharply since the peak year of 1977 when demand averaged over 3.1 million barrels per day. By 1982, residual fuel oil consumption averaged 1.7 million barrels per day, a 45-percent drop. The price of residual fuel oil more than doubled over this period, explaining part of the rapid decline in demand. However, even though the price of residual fuel oil in both real and nominal terms actually fell between 1981 and 1982, residual fuel oil demand has continued to drop. The relative price advantage of natural gas, albeit a shrinking one, has reduced the residual fuel oil market. In fact, in some regions in the country, residual fuel oil might be less expensive than the equivalent amount of energy in the form of natural gas.

The weak economy over the past several years, especially in the industrial sector, also has reduced residual fuel oil consumption. From the second half of 1981 through 1982, industrial production fell dramatically, further depressing the demand for this fuel.

Residual fuel demand is expected to rebound in the latter part of 1983 and the first half of 1984 because of an improved economy and an ever-narrower price difference with respect to natural gas (Table 14). Electric utility shipments of residual fuel are expected to decrease by 3 percent between 1982 and 1983, then increase by about 27 percent between the first half of 1983 and the first half of 1984.

Nonutility consumption of residual fuel oil is projected to decline by 6 percent between 1982 and 1983 and then increase by 20 percent from the first half of 1983 to the first half of 1984.

A statistical test on residual fuel oil consumption data over the past 8 years indicates that a structural change has occurred in the residual fuel oil market since oil price decontrol in January 1981. This test shows that demand for this fuel fell by an average of 220,000 barrels per day on a yearly basis since price decontrol, even after the price and macroeconomic effects are taken into account. A possible decrease in bunker fuel consumption since decontrol, a long-term shift toward the use of more-efficient combustion equipment, or perhaps some other structural effect may explain this change.

Other Petroleum Products

The "other" petroleum products category comprises jet fuels, liquefied petroleum gases, petroleum coke, kerosene, road oil and asphalt, still gas, petrochemical feedstocks and ethane, waxes, lubricants, aviation gasoline, special naphthas, and miscellaneous products.

Jet fuel consumption for 1983 is expected to remain at the 1982 level of 1 million barrels per day. Despite the waning effects of the Professional Air Traffic Controllers (PATCO) strike on jet fuel consumption, kerosene-based jet fuel consumption is projected to continue to decline from 1982 to 1983 primarily because of low usage during the first quarter of 1983. The effects of the strike are assumed to phase out by the middle of 1984. Total consumption of jet fuel during the first half of 1984 is projected to remain at about 1 million barrels per day. Military purchases of naphtha-type jet fuel are expected to increase, partially offsetting the projected decline in consumption of kerosene-based jet fuel by commercial users.

Consumption of liquefied petroleum gases (LPG's) is expected to remain essentially unchanged, averaging about 1 million barrels per day in 1983, although normal seasonal variation will occur. Demand for "other" petroleum products, excluding jet fuels and LPG's, is projected to remain relatively stable at 2.62 million barrels per day in 1983. A strong economic recovery in the second half of 1983 is expected to offset the relatively low first-quarter demand, which was below year-earlier levels because of lower industrial and chemical production. Chemical production, a key determinant for petrochemical feedstocks demand, is projected to be 9.4 percent above year-earlier levels in the first half of 1984. Together with the expected strong showing in the overall index of manufacturing, consumption of this category of products is projected to increase about 10 percent from the first half of 1983 to the first half of 1984, or by about 250,000 barrels per day.

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 quarter of 1983, the effects of high natural gas prices, a 10-percent warmer-than-normal winter, and a low level of industrial output resulted in a 13-percent decline in total natural gas consumption from year-earlier levels. The economic recovery is not expected to be evident in the natural gas market until the fourth quarter of 1983, when both natural gas consumption and domestic production increase over year-earlier levels (Table 15). The fourth-quarter recovery in the natural gas

market is not expected to be sufficient to offset the particularly low first quarter, thus resulting in a net decline in natural gas consumption and domestic production for the year. In the first half of 1984, total natural gas consumption and domestic production are projected to increase by 7.8 percent and 4.6 percent respectively. This projected turnaround in the natural gas market is contingent on the effects of a strong economic recovery along with a return to normal winter weather, overriding the effects of continuously rising natural gas prices.

Natural Gas Demand. Total industrial, residential, and commercial gas consumption declined by 7.3 percent to 14 trillion cubic feet in 1982. In the first quarter of 1983, total industrial, residential, and commercial gas use declined by 12.6 percent from year-earlier levels, largely driven by the lower heating requirements of the mild winter and high gas prices. By the fourth quarter of 1983, total demand for the 3 sectors combined is forecast to increase by 1.4 percent relative to the same quarter in 1982, primarily as a result of the economic recovery. The continuing economic upswing forecast for the first half of 1984 and the assumed return to normal heating-season requirements cause the gas demand forecast for the combined industrial, residential, and commercial sector to increase by 2.9 percent above year-earlier levels.

Electric utility demand for natural gas declined by 11.3 percent between 1981 and 1982 because of the decline in total electricity generation, high prices for gas, and the record high level of hydroelectric generation in the West. The first quarter of 1983 continued this downward trend, with electric utility natural gas consumption declining to nearly 16 percent below year-earlier levels. However, this trend is projected to reverse in the forecast period. In 1983, electric utility demand for natural gas is projected to be 4.3 percent above the 1982 level, then to continue rising through the first half of 1984 because of the projected increase in total electricity generation and an assumed return to normal levels of hydroelectricity production by the end of 1983.

Natural Gas Supply. Domestic production of natural gas is projected to be 16.74 trillion cubic feet in 1983, 4.6 percent below the 1982 level. Thus, 1983 is expected to experience the lowest level of U.S. natural gas production in 17 years. This forecast reflects a continuation of the recent depressed level of natural gas production. In the first quarter of 1983, natural gas production was 4.20 trillion cubic feet, 11.2 percent below year-earlier levels but nearly equal to the rate of production in the last half of 1982. In the second and third quarters of 1983, natural gas production is forecast to be 4.13 trillion cubic feet, increasing to 4.27 trillion cubic feet by the fourth quarter of 1983. As natural gas consumption increases in the first half of 1984, a result of the assumed return to normal winter weather, natural gas production is expected to be 4.6 percent above year-earlier levels.

Pipeline imports of natural gas from Canada and Mexico are projected to provide about 5 percent of U.S. gas consumption throughout the forecast period. In 1982, liquefied natural gas (LNG) imports from Algeria were approximately equal to U.S. LNG exports to Japan. However, imports of Algerian LNG during the first quarter of 1983 were about 47 billion cubic feet, nearly five times the quantity received in the first quarter of 1982, while U.S. LNG exports remained level. The sharp increase in Algerian LNG imports, which started in November

of 1982, is the result of commitments under previously negotiated contracts. In the forecast period, U.S. LNG exports are expected to remain unchanged while LNG imports from Algeria continue at their recent high level, leading to net LNG imports of 130 billion cubic feet in 1983.

Stocks of natural gas in underground storage increased by 310 billion cubic feet in 1982 and are expected to rise by another 260 billion cubic feet, to 7.1 trillion cubic feet, by the end of 1983. Stocks of natural gas in underground storage had already reached 5.96 trillion cubic feet at the end of March 1983. This was 11 percent above the year-earlier level and a record high for the end of the winter heating season (November through March). Most of the projected increase in underground storage results from the recent low levels of gas demand that are expected to continue through the third quarter of 1983.

Coal

During the first 5 months of 1983, U.S. coal production is estimated to have been about 51 million tons (15.4 percent) below production in the same period of 1982. Despite a small projected increase in U.S. coal consumption during 1983, production in 1983 is forecast to be 46.6 million tons below the record level attained in 1982--and at its lowest level since 1979. (See Table 16.) Lower 1983 coal production is forecast because consumer and producer stock levels are projected to fall by a combined total of 19.8 million tons during the year and exports are projected to be 15.8 million tons lower than in 1982.

Coal Consumption. Analyses of recent coal consumption data and the accompanying short-term forecasts reflect the recent trends that show a decline in domestic coal production. Domestic coal use declined in all three consuming sectors (coke plants, electric utilities, and retail and industrial users) during 1982 and is now projected to recover only slightly in 1983.

Electric utility consumption of coal continues to be constrained by mild, wet weather. Decreased demand for electricity has extended the down-time of units taken off line for normally scheduled maintenance. The current forecast calls for a 1.1-percent increase in electric utility coal consumption between 1982 and 1983 and an average annual rate of growth of less than 0.3 percent between 1981 and 1983.

Hydroelectric generation is expected to continue to displace coal-fired generation through 1983 because of abnormally high levels of precipitation. Even with the assumed return of "normal" weather patterns, spring rains and the melting snowpack should maintain the high levels of hydroelectric generation.

The amount of coal carbonized at coke plants is estimated to have decreased by more than a million tons between the fourth quarter of 1982 and the first quarter of 1983, despite a 4-million-ton increase in raw steel production over the same period. As expected, the effects of a relatively strong increase in steel production on metallurgical coal consumption are being delayed by the high levels of coke and pig iron inventories. The current forecast is based partially on the assumption that coke stocks will continue to be drawn down through the end of 1983 as coke consumption and raw steel production continue to increase. Coke inventories are projected to drop from 135 days' supply at the end of September 1982 to 45 days' supply by the end of 1983. Coking coal

consumption is not expected to begin showing increases comparable to those in raw steel production and coke consumption until late 1983 or early 1984. Consequently, coking coal consumption in 1983 is forecast to fall slightly below the depressed 1982 level.

Following the pattern of the past several years, coal consumed by retail and industrial users is forecast to remain essentially flat through 1983, with 1983 consumption only 1.5 million tons above the 1982 level. However, responding to more pronounced increases in economic activity and the assumed return of normal weather, coal consumption in this sector is forecast to begin a significant upward trend during the last quarter of 1983.

Coal Exports. The current forecast for coal exports reflects another significant decrease from those published in earlier issues of the Outlook. The forecast for 1983 coal exports has been steadily revised downward from the 119-million-ton forecast published in the August 1982 Outlook to the current forecast of 90.4 million tons. The worldwide recession continues to put downward pressure on the demand for metallurgical coal and to severely limit the growth of new demand for steam coals in the international market.

Completed expansion of production and export capacities by Australia and South Africa, relative labor stability in Australia, and Poland's quicker-than-expected return to prominence in the European market are intensifying U.S. coal exporters' problems as the marginal suppliers of export coal to Europe and the Pacific Rim. The continued strength of the dollar and Poland's willingness to continue selling coal at below-market prices to earn foreign currency only serve to exacerbate the problem.

Current price and contract negotiations between Japanese metallurgical coal buyers and their suppliers also add an element of uncertainty to the analysis. Barring sudden and significant concessions by Japanese and European coal traders, changes in world economic conditions, changes in Polish or Australian labor stability, or significant changes in the value of the U.S. dollar relative to other currencies, it will be difficult for the United States to maintain its 1982 share of the international coal market through the end of this forecast period.

Electric Power

Total electricity generation in 1982 was 2,241 billion kilowatt-hours, a 2.3-percent decline from the 1981 level; the economic recession, continued increases in conservation, and a relatively cool summer contributed to the decline. Industrial demand for electricity, which is very sensitive to the level of economic activity, was nearly 10 percent below the 1981 level; residential and commercial demand actually increased slightly between 1981 and 1982.

Despite early signs of the economic recovery beginning, electricity generation during the first half of 1983 is still projected to be more than 1 percent below year-earlier levels. (See Table 17.) Preliminary data that became available after this projection was made indicate that this first-half-1983 decline could be more than 2 percent. Much of this decline is attributable to the mild winter weather. Based on a normal relationship between economic

growth and electricity generation, generation in the second quarter of 1983 is projected to be 2.8 percent above year-earlier levels. However, preliminary data for the second quarter of 1983 indicate that electricity generation will probably be about equal to year-earlier levels.

Because of the assumed economic recovery and return to normal weather, electricity generation is projected to be more than 5 percent above year-earlier levels in the last half of 1983. This implies that total generation for the year could be as much as 1 to 2 percent over the 1982 level.

The rebound in electricity generation in 1983 depends to a large extent on a turnaround in industrial demand; however, industrial use of electricity, which is fairly insensitive to winter weather, continued to fall in the first quarter of 1983. If the industrial demand for electricity fails to pick up as the economy recovers (perhaps indicating some structural change or stringent efficiency measures) or if the summer weather is abnormally cool (as it was in 1982), electricity generation could be lower than the levels forecast here. Continued economic growth in the first half of 1984, reflected in the expected 5.3-percent increase in personal income over the same period a year earlier, and assumed normal weather are projected to result in a substantial increase in electricity generation in 1984.

The residential price of electricity, which has been increasing at double-digit rates for the past 3 years, is expected to moderate in 1983, increasing only 4.8 percent between 1982 and 1983 and about 5.6 percent from the first half of 1983 to the first half of 1984. Interest rates for newly issued utility bonds are forecast to be lower in 1983 and 1984 than in 1982, and increases in the cost of fuel to electric utilities are also expected to be lower than in 1982.

Generation by Fuel Source. Shares of generation in 1983 are expected to be: 53 percent coal, 14 percent natural gas, 13 percent nuclear, 6 percent petroleum, 14 percent hydroelectric power, and less-than-1-percent other fuel sources. The forecasted increase in total generation of 45 billion kilowatt-hours between 1982 and 1983 is projected to come from increases in coal and nuclear generation. The level of hydroelectric generation and the combined share of oil and natural gas generation are expected to be only slightly above the 1982 levels.

Electricity generation from nuclear power is forecast to be 294 billion kilowatt-hours in 1983, 3.9 percent over the 1982 level. This projected level of nuclear generation for 1983 is below the February 1983 forecast, both because of plant delays and because a less optimistic capacity utilization factor is assumed for 1983. The capacity factor is expected to increase through the forecast period, although the improvement will start from a lower point and is expected to begin later, perhaps not until the second quarter of 1984. Five new plants (LaSalle 1, San Onofre 2, Susquehanna 1, Summer 1, and San Onofre 3) are expected to achieve commercial operation in 1983. The 11-percent increase in nuclear generation projected between the first half of 1983 and the first half of 1984 is based on the assumption that 4 new plants (Grand Gulf 1, McGuire 2, St. Lucie 2, and Diablo Canyon 1) will begin operation in the first two quarters of 1984. In addition, the restart of Three Mile Island 1 is assumed to occur during this period. To date, of the plants forecast to begin operation over the next 15 months, 4 plants have low-power licenses, and 4 plants have full-power licenses.

Hydroelectric generation appears to be headed for another record-breaking year in 1983, based on first-quarter data which were 5 percent above the very high level of generation for the same period last year. Rainfall and snow-pack levels during the winter of 1982-1983 are much higher than normal, so water flows are expected to exceed normal levels through 1983. Electricity generation from hydropower is forecast to be 311 billion kilowatt-hours in 1983, then return to normal levels during 1984 (with normal levels assumed to increase by 1 percent to account for capacity additions).

Coal-fired generation dropped by nearly 1 percent between 1981 and 1982 and is expected to increase by only about 2.1 percent between 1982 and 1983. Since the February 1983 forecast, the projection for 1983 coal-fired generation has been lowered 32 billion kilowatt-hours, to 1,216 billion kilowatt-hours, because the average level of capacity utilization has been lower (due to record levels of hydroelectric generation), and new plants have not begun operation as expected. The rate of increase in coal-fired generation is expected to be 6.2 percent between the first half of 1983 and the first half of 1984 as the demand for electricity increases.

Combined generation from oil and natural gas in 1982 dropped over 18 percent from the 1981 level as a result of increased levels of generation from coal and nuclear power, increased availability of inexpensive hydroelectricity, and decreased electricity demand. With the forecast increase in electricity generation in 1983, the combined generation from oil and natural gas is expected to increase by about 2 percent. Because many electric utilities have dual-fired systems that can use either oil or natural gas, the share of each fuel is sensitive to the relative prices: the rapid downward trend in oil-fired generation since 1978 may moderate because of the expected fall in the price of oil to electric utilities between 1982 and 1983 at the same time that natural gas prices are expected to rise by about 9 percent. Oil and natural gas are assumed to be used as swing fuels for electricity generation. During the first half of 1984, generation from each of these fuels is expected to rise above year-earlier levels as the total demand for electricity increases.

Total Domestic Energy Balance

Total U.S. energy consumption in 1983 is projected to be 70.7 quadrillion Btu, almost the same as the 70.8 quadrillion Btu consumed in 1982 (Table 18). In the February Outlook, it was projected that total energy consumption would rise between 1982 and 1983. However, first-quarter 1983 consumption was 1 quadrillion Btu lower than forecast in February because of unseasonably warm weather in the United States and the continuing trend towards energy conservation. As a result, the current projection of total 1983 energy consumption has been revised downward to show little change from 1982 consumption.

At the sectoral level, nonutility consumption is projected to decline by a half quadrillion Btu between 1982 and 1983. However, fourth-quarter 1983 energy consumption is forecast to be 0.8 quadrillion Btu above year-earlier levels because of the projected continuation of the economic recovery. Nonutility

consumption in the first half of 1984 is forecast to be 24.3 quadrillion Btu, more than 1 quadrillion Btu above the level in the corresponding period of 1983.

Coal and nuclear energy consumption are projected to increase between 1982 and 1983, while the use of all other major fuels declines. Nuclear energy's share of total energy consumption is projected to increase to 4.5 percent (from 4.3 percent in 1982), while coal's share increases by 0.4 percent to 22.1 percent. The shares of both oil and gas are projected to decline by 0.3 percent to 42.4 and 25.8 percent, respectively, principally as a result of unexpectedly low consumption during the first quarter of 1983.

The total supply of energy is also projected to decline slightly between 1982 and 1983. U.S. energy production is expected to decline by 2.7 percent to 62 quadrillion Btu, as natural gas and coal production decline in response to lowered total demand. Net imports of energy are projected to increase, however, as coal exports fall sharply and imports of crude oil increase in response to small declines in domestic petroleum production and withdrawals from primary inventories.

The energy intensity of U.S. economic activity is projected to decline to 46,700 Btu per 1972 dollar of GNP in 1983. This represents a drop of 2.6 percent from 1982, continuing the trend of declining Btu/GNP ratios since 1970. This drop is much larger than the 0.5-percent decline that had been projected in the February Outlook, principally because of low energy consumption during the first quarter of 1983.

Table 4. Short-Term Energy Prices (Nominal), History and Projections, 1981-1984 2nd Quarter

Product	History				1983				Projections				1984			
	1981	1982	Year	1st	2nd	3rd	4th	Year	1st	Price	2nd	3rd	4th	Year	1st	2nd
Petroleum																
Gasoline ¹ (cents per gallon)	135.3	130.9	124.3	130.8	126.4	128.1	117.3	Low	120.7	119.9	116.3	118.6	112.4	110.1		
No. 2 Heating Oil, Wholesale (cents per gallon)	98.2	93.4	87.1	91.7	95.1	92.0	85.4	Low	82.6	77.8	74.6	80.1	75.3	75.5		
No. 2 Heating Oil, Retail (cents per gallon)	120.5	119.3	114.6	115.6	120.3	118.6	110.4	Low	108.1	102.6	99.4	105.1	100.9	101.6		
No. 6 Residual Fuel Oil ¹² (dollars per barrel)	32.50	29.78	28.91	28.73	29.20	29.08	27.23	Low	28.06	26.32	24.80	26.60	25.13	25.55		
Kerosene-Based Jet Fuel (cents per gallon)	103.1	100.7	95.9	95.3	95.9	96.9	91.5	Low	89.0	84.7	81.1	86.6	80.5	80.7		
Other								Base	28.54	28.40	28.04	28.05	28.40	28.82		
Coal, Delivered to Utilities (cents per million Btu)	153.2	163.5	165.5	165.0	164.2	164.6	165.5	Base	167.1	168.7	170.4	167.9	172.0	173.7		
Natural Gas, Residential (cents per 1,000 cu. ft)	456.0	493.0	547.7	566.0	603.7	552.6	615.0	Low	609.2	641.1	646.7	628.0	646.6	677.5		
Natural Gas, to Utilities (cents per million Btu)	282.5	309.1	333.6	356.8	355.8	340.7	355.8	Low	340.0	365.0	372.4	358.3	381.1	381.6		
Electricity, Residential (cents per kilowatt-hour)	6.20	6.38	6.91	7.19	6.95	6.86	6.77	Low	6.79	7.09	6.79	6.86	6.71	7.11		
								Base	7.25	7.56	7.24	7.21	7.16	7.59		
								High	7.68	8.02	7.68	7.54	7.60	8.05		

¹Average for all grades and services.

²Retail residual fuel oil-average, all sulfur contents.

Note: First quarter 1983 estimated for No. 2 Heating Oil, Wholesale; No. 6 Residual Fuel; Kerosene-Based Jet Fuel; Coal; and Natural Gas, to Utilities.

Sources: Energy Information Administration, Monthly Energy Review, Monthly Petroleum Product Price Report, DOE/EIA-0335(83/05), and Petroleum Marketing Monthly, DOE/EIA-0380(83/04) and Monthly Petroleum Product Price Report, DOE/EIA-0332(82/13).

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

	History					Projections						
	1982					Year	1983					
	1st	2nd	3rd	4th			1st	2nd	3rd	4th	Year	
Supply^a												
Production												
U.S. (50 States)	10.8	10.8	10.8	10.9	10.8	10.8	10.8	10.7	10.7	10.8	10.7	
OPEC	20.9	18.5	19.3	20.3	19.8	16.3	17.0	19.7	21.2	18.5	20.7	
Other Non-OPEC	11.7	12.2	12.4	12.8	12.3	12.4	12.9	13.1	13.2	12.9	13.0	
Total Non-Communist World	43.4	41.5	42.5	44.0	42.9	39.5	40.7	43.5	45.1	42.2	44.4	
Net Communist Exports	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.4	
Total Supply	44.9	43.0	44.0	45.5	44.4	41.1	42.2	45.0	46.6	43.7	45.8	
Net Stock Additions												
U.S. (50 States excl. SPR)	-1.1	-0.6	0.4	0.3	-0.2	-1.2	0.1	0.5	-0.3	-0.2	-0.4	
U.S. SPR	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.1	
Other Non-Communist	-2.6	-1.3	-0.1	-1.0	-1.2	-3.8	-1.5	0.4	0.0	-1.3	-1.6	
Total Stock Additions	-3.5	-1.7	0.5	-0.3	-1.2	-4.8	-1.2	1.2	-0.2	-1.3	-1.9	
Normal Seasonal Stock Addition ...	-3.3	1.8	2.4	-1.1	0.0	-3.3	1.8	2.4	-1.1	0.0	-3.3	
Product Supplied												
U.S. (50 States)	15.8	15.3	14.8	15.1	15.3	15.0	14.6	14.9	15.8	15.1	15.9	
U.S. Territories	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	
Japan	5.4	4.1	4.0	4.9	4.6	5.0	3.9	4.0	4.7	4.4	5.0	
OECD Europe	13.2	11.5	11.3	12.1	12.0	12.3	11.2	11.1	12.3	11.7	12.9	
Other Non-Communist World	13.6	13.4	13.1	13.4	13.4	13.2	13.3	13.4	13.6	13.4	13.5	
Total Non-Communist World	48.4	44.7	43.5	45.8	45.6	45.9	43.4	43.8	46.8	45.0	47.7	
Closing Stocks												
(billion barrels)	4.9	4.8	4.8	4.8	4.8	4.4	4.2	4.4	4.3	4.3	4.2	
											4.4	

^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, May 1983, and 1981 International Energy Annual (DOE/EIA-0219(81)); Organization for Economic Cooperation and Development, Quarterly Oil Statistics, Third Quarter 1982; and Petroleum Economics Limited's Quarterly Supply/Demand Outlook, January 1983.

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

	History						Projections					
	1981		1982		1983		1983		1984		1984	
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st
Supply												
Production												
Crude Oil	8.57	8.65	8.66	8.69	8.68	8.67	8.66	8.68	8.65	8.61	8.65	8.59
North Slope	1.53	1.63	1.61	1.63	1.59	1.61	1.64	1.64	1.63	1.64	1.66	1.65
Subarctic ¹	7.05	7.03	7.05	7.06	7.09	7.06	7.01	7.04	7.01	6.98	7.01	6.92
Natural Gas Liquids	1.61	1.55	1.54	1.53	1.60	1.55	1.60	1.56	1.54	1.57	1.57	1.56
Other Domestic	0.05	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Processing Gain	0.51	0.51	0.50	0.53	0.57	0.53	0.47	0.47	0.50	0.51	0.49	0.51
Total Production	10.74	10.75	10.76	10.80	10.91	10.81	10.77	10.76	10.74	10.74	10.75	10.68
Imports (including SPR)												
Crude Oil	4.40	3.16	3.30	3.89	3.48	3.46	2.49	3.45	4.04	3.99	3.50	3.69
Refined Products	1.60	1.64	1.46	1.53	1.69	1.58	1.42	1.48	1.64	1.74	1.57	2.19
Total Imports	6.00	4.80	4.77	5.43	5.17	5.04	3.90	4.93	5.68	5.73	5.07	5.87
Exports												
Crude Oil	0.23	0.29	0.18	0.24	0.24	0.24	0.18	0.19	0.20	0.20	0.19	0.20
Refined Products	0.37	0.55	0.59	0.56	0.62	0.58	0.70	0.59	0.59	0.57	0.61	0.64
Total Exports	0.59	0.84	0.76	0.80	0.86	0.82	0.88	0.78	0.79	0.77	0.80	0.84
Net Imports (incl. SPR)	5.40	3.96	4.00	4.63	4.31	4.23	3.02	4.15	4.89	4.96	4.26	5.03
Primary Stock Levels² (million barrels)												
Opening	1317.45	1253.31	1152.37	1098.12	1136.65	1253.31	1168.19	1063.61	1069.78	1113.65	1168.19	1090.95
Closing	1253.31	1152.37	1098.12	1136.65	1135.10	1135.10	1063.61	1069.78	1113.65	1090.95	1090.95	1058.35
Net Withdrawals	0.18	1.12	0.60	-0.42	0.02	0.32	1.16	-0.07	-0.48	0.25	0.21	0.36
(million barrels per day)												-0.13
SPR Fill Rate Additions(-) ..	-0.34	-0.20	-0.17	-0.15	-0.17	-0.17	-0.20	-0.24	-0.27	-0.14	-0.21	-0.14
(million barrels per day)										*		
Total Primary Supply	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.61	14.89	15.80	15.02	15.92
Product Supplied												
Motor Gasoline	6.59	6.21	6.78	6.65	6.50	6.54	6.29	6.57	6.54	6.33	6.43	6.05
Distillate Fuel Oil	2.83	3.16	2.63	2.27	2.64	2.67	2.83	2.38	2.29	3.19	2.67	3.36
Residual Fuel Oil	2.09	2.10	1.64	1.49	1.55	1.70	1.57	1.52	1.61	1.73	1.61	1.98
Other Products	4.82	4.64	4.56	4.78	4.67	4.66	4.52	4.45	4.75	4.85	4.65	4.84
Total Reclassified	-0.27	-0.31	-0.34	-0.35	-0.24	-0.31	-0.20	-0.30	-0.30	-0.28	-0.30	-0.30
Total Product Supplied	16.06	15.79	15.27	14.84	15.12	15.26	15.02	14.61	14.89	15.80	15.08	15.92
Unaccounted for	-0.08	-0.16	-0.09	0.02	-0.06	-0.07	-0.26	0.00	0.00	-0.06	0.00	0.00
Total Disposition	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.61	14.89	15.80	15.02	15.92

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 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 March 1983 *Petroleum Supply Monthly*.)

Note: Minor discrepancies with other EIA published historical data are due to rounding.
 Sources: Energy Information Administration, 1981 *Petroleum Supply Annual*, and *Petroleum Supply Monthly*, April 1983. Historical data for March 1983 are preliminary.

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

	History						Projections						
	1981 Year	1st	2nd	1982 3rd	4th	Year	1st	2nd	1983 3rd	4th	Year	1984 1st	2nd
Supply													
Production													
Crude Oil	8.57	8.65	8.66	8.69	8.68	8.67	8.66	8.68	8.65	8.61	8.65	8.59	8.56
North Slope	1.53	1.63	1.61	1.63	1.59	1.61	1.64	1.64	1.64	1.63	1.64	1.66	1.65
Subarctic ¹	7.05	7.03	7.05	7.06	7.09	7.06	7.01	7.04	7.01	6.98	7.01	6.92	6.91
Natural Gas Liquids	1.61	1.55	1.54	1.53	1.60	1.55	1.60	1.56	1.54	1.57	1.57	1.56	1.55
Other Domestic	0.05	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05
Processing Gain	0.51	0.51	0.50	0.53	0.57	0.53	0.47	0.48	0.51	0.52	0.49	0.50	0.53
Total Production	10.74	10.75	10.76	10.80	10.91	10.81	10.77	10.77	10.75	10.76	10.76	10.69	10.69
Imports (including SPR)													
Crude Oil	4.40	3.16	3.30	3.89	3.48	3.46	2.49	3.53	4.31	4.32	3.67	4.03	4.64
Refined Products	1.60	1.64	1.46	1.53	1.69	1.58	1.42	1.54	1.83	1.92	1.68	2.42	1.99
Total Imports	6.00	4.80	4.77	5.43	5.17	5.04	3.90	5.07	6.14	6.24	5.35	6.45	6.63
Exports													
Crude Oil	0.23	0.29	0.18	0.24	0.24	0.24	0.18	0.19	0.20	0.20	0.19	0.20	0.20
Refined Products	0.37	0.55	0.59	0.56	0.62	0.58	0.70	0.59	0.59	0.57	0.61	0.64	0.66
Total Exports	0.59	0.84	0.76	0.80	0.86	0.82	0.88	0.78	0.79	0.77	0.80	0.84	0.86
Net Imports (incl. SPR) ..	5.40	3.96	4.00	4.63	4.31	4.23	3.02	4.30	5.35	5.46	4.54	5.60	5.77
Primary Stock Levels²													
(million barrels)													
Opening	1317.45	1253.31	1152.37	1098.12	1136.65	1253.31	1168.19	1063.61	1069.63	1113.12	1168.19	1089.99	1056.41
Closing	1253.31	1152.37	1098.12	1136.65	1135.10	1135.10	1063.61	1069.63	1113.12	1089.99	1089.99	1056.41	1067.51
Net Withdrawals	0.18	1.12	0.60	-0.42	0.02	0.32	1.16	-0.07	-0.47	0.25	0.21	0.37	-0.12
(million barrels per day)													
SPR Fill Rate Additions(-) ..	-0.34	-0.20	-0.17	-0.15	-0.17	-0.17	-0.20	-0.24	-0.27	-0.14	-0.21	-0.14	-0.14
(million barrels per day)													
Total Primary Supply	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.76	15.37	16.33	15.31	16.52	16.19
Product Supplied													
Motor Gasoline	6.59	6.21	6.78	6.65	6.50	6.54	6.29	6.57	6.56	6.39	6.45	6.13	6.47
Distillate Fuel Oil	2.83	3.16	2.63	2.27	2.64	2.67	2.83	2.39	2.35	3.30	2.72	3.48	2.87
Residual Fuel Oil	2.09	2.10	1.64	1.49	1.55	1.70	1.57	1.62	1.94	2.00	1.78	2.29	2.17
Other Products	4.82	4.64	4.56	4.78	4.67	4.66	4.52	4.48	4.81	4.94	4.69	4.93	4.98
Total Reclassified	-0.27	-0.31	-0.34	-0.35	-0.24	-0.31	-0.20	-0.30	-0.30	-0.30	-0.28	-0.30	-0.30
Total Product Supplied	16.06	15.79	15.27	14.84	15.12	15.26	15.02	14.76	15.37	16.33	15.37	16.52	16.19
Unaccounted for	-0.08	-0.16	-0.09	0.02	-0.06	-0.07	-0.26	0.00	0.00	0.00	-0.06	0.00	0.00
Total Disposition	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.76	15.37	16.33	15.31	16.52	16.19

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 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 March 1983 *Petroleum Supply Monthly*.)

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

Sources: Energy Information Administration, 1981 *Petroleum Supply Annual*, and *Petroleum Supply Monthly*, April 1983. Historical data for March 1983 are preliminary.

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

	History							Projections							
	1981	Year	1st	2nd	1982	3rd	4th	Year	1st	2nd	1983	3rd	4th	Year	1st
Supply Production															
Crude Oil	8.57	8.65	8.66	8.69	8.68	8.67	8.66	8.68	8.65	8.61	8.65	8.59	8.59	8.56	
North Slope	1.53	1.63	1.61	1.63	1.59	1.61	1.64	1.64	1.64	1.63	1.64	1.66	1.66	1.65	
Subarctic	7.05	7.03	7.05	7.06	7.09	7.06	7.01	7.04	7.01	6.98	7.01	6.92	6.92	6.91	
Natural Gas Liquids	1.61	1.55	1.54	1.53	1.60	1.55	1.60	1.56	1.54	1.57	1.57	1.56	1.56	1.55	
Other Domestic	0.05	0.04	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05	
Processing Gain	0.51	0.51	0.50	0.53	0.57	0.53	0.47	0.47	0.50	0.50	0.48	0.48	0.48	0.50	
Total Production	10.74	10.75	10.76	10.80	10.91	10.81	10.77	10.76	10.74	10.74	10.75	10.67	10.67	10.66	
Imports (including SPR)															
Crude Oil	4.40	3.16	3.30	3.89	3.48	3.46	2.49	3.42	3.98	3.89	3.45	3.54	3.54	3.95	
Refined Products	1.60	1.64	1.46	1.53	1.69	1.58	1.42	1.46	1.62	1.70	1.55	2.12	2.12	1.71	
Total Imports	6.00	4.80	4.77	5.43	5.17	5.04	3.90	4.88	5.60	5.59	5.00	5.66	5.66		
Exports															
Crude Oil	0.23	0.29	0.18	0.24	0.24	0.24	0.18	0.19	0.20	0.20	0.19	0.20	0.20	0.20	
Refined Products	0.37	0.55	0.59	0.56	0.62	0.58	0.70	0.59	0.59	0.57	0.61	0.64	0.64	0.66	
Total Exports	0.59	0.84	0.76	0.80	0.86	0.82	0.88	0.78	0.79	0.77	0.80	0.84	0.84	0.86	
Net Imports (incl. SPR)	5.40	3.96	4.00	4.63	4.31	4.23	3.02	4.11	4.81	4.81	4.20	4.82	4.82	4.80	
Primary Stock Levels² (million barrels)															
Opening	1317.45	1253.31	1152.37	1098.12	1136.65	1253.31	1168.19	1063.61	1069.82	1113.77	1168.19	1091.19	1058.96		
Closing	1253.31	1152.37	1098.12	1136.65	1135.10	1135.10	1063.61	1069.82	1113.77	1091.19	1091.19	1058.96	1071.26		
Net Withdrawals	0.18	1.12	0.60	-0.42	0.02	0.32	1.16	-0.07	-0.48	0.25	0.21	0.35	-0.14		
(million barrels per day)															
SPR Fill Rate Additions(-) ..	-0.34	-0.20	-0.17	-0.15	-0.17	-0.17	-0.20	-0.24	-0.27	-0.14	-0.21	-0.14	-0.14		
(million barrels per day)															
Total Primary Supply	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.56	14.81	15.65	14.95	15.70	15.70	15.18	
Product Supplied															
Motor Gasoline	6.59	6.21	6.78	6.65	6.50	6.54	6.29	6.56	6.53	6.31	6.42	6.01	6.30		
Distillate Fuel Oil	2.83	3.16	2.63	2.27	2.64	2.67	2.83	2.37	2.27	3.14	2.65	3.28	2.64		
Residual Fuel Oil	2.09	2.10	1.64	1.49	1.55	1.70	1.57	1.48	1.57	1.67	1.57	1.91	1.74		
Other Products	4.82	4.64	4.56	4.78	4.67	4.66	4.52	4.44	4.74	4.83	4.64	4.80	4.80		
Total Reclassified	-0.27	-0.31	-0.34	-0.35	-0.24	-0.31	-0.20	-0.30	-0.30	-0.30	-0.28	-0.30	-0.30	-0.30	
Total Product Supplied	16.06	15.79	15.27	14.84	15.12	15.26	15.02	14.56	14.81	15.65	15.01	15.70	15.70	15.18	
Unaccounted for	-0.08	-0.16	-0.09	0.02	-0.06	-0.07	-0.26	0.00	0.00	0.00	-0.06	0.00	0.00	0.00	
Total Disposition	15.98	15.63	15.18	14.87	15.06	15.18	14.76	14.56	14.81	15.65	14.95	15.70	15.70	15.18	

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 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 March 1983 *Petroleum Supply Monthly*.)

Note: Minor discrepancies with other EIA published historical data are due to rounding.
Sources: Energy Information Administration, 1981 *Petroleum Supply Annual*, and *Petroleum Supply Monthly*, April 1983. Historical data for March 1983 are preliminary.

**Table 10. Petroleum Demand: Alternative Cases and Sensitivity Differentials
(Million Barrels per Day)**

Sensitivities	1983				1984	
	2nd	3rd	4th	Year	1st	2nd
Demand in 50 States						
Low Price	14.76	15.37	16.33	15.37	16.52	16.19
Base Case	14.61	14.89	15.80	15.08	15.92	15.46
High Price	14.56	14.81	15.65	15.01	15.70	15.18
Weather Sensitivity						
Adverse Weather	0.06	0.14	0.21	0.10	0.32	0.06
Favorable Weather	-0.06	-0.14	-0.21	-0.10	-0.32	-0.06
Economic Sensitivity						
High Economic Activity	0.06	0.14	0.18	0.10	0.23	0.28
Low Economic Activity	-0.06	-0.14	-0.18	-0.10	-0.23	-0.28
New Car Efficiency						
Low MPG	0.02	0.04	0.06	0.03	0.07	0.10
High MPG	-0.03	-0.05	-0.08	-0.04	-0.11	-0.14
Preliminary Data Adjustment	0.28	0.15	0.07	0.13	0.04	0.02
Combined Sensitivity Differentials						
High Demand	0.29	0.25	0.29	0.19	0.40	0.30
Low Demand	0.09	0.20	0.29	0.15	0.41	0.32
Range of Projected Demand						
High Demand ¹	15.05	15.62	16.62	15.56	16.92	16.49
Low Demand ²	14.47	14.61	15.36	14.86	15.29	14.86

¹ Low Price case demand plus the combined effects of adverse weather, high economic activity, low MPG, and preliminary data adjustment.

² High Price case demand less the combined effects of favorable weather, low economic activity, and high MPG.

Table 11. Petroleum Inventories

Unit of Measure	End of	End of	End of	Mid-	End of	Base Case	Case	Projections
	1979	1980 ^b	1981	1982	1982 ^c	1983	1983	1984
Million Barrels	1,250	1,284	1,253	1,098	1,135	1,070	1,091	1,070
Days' Supply ^d	67.5	75.3	78.0	70.2	74.4	71.8	72.3	68.9

^aEnd-of-year primary 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.)

^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 March 1983 Petroleum Supply Monthly.)

^dInventory level divided by the previous year'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 75.9 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 old basis, the 1983 statistic would have been 70.2 days' supply.

Source: Energy Information Administration, Petroleum Supply Monthly, April 1983. Historical data for March 1983 are preliminary.

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

	History								Projections					
	1981		1982				1983		1984					
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	
Supply														
Domestic Production ¹	6.40	6.04	6.40	6.59	6.35	6.35	5.92	6.39	6.30	6.26	6.22	5.95	6.11	
Imports	0.16	0.14	0.18	0.23	0.19	0.19	0.17	0.19	0.21	0.21	0.20	0.21	0.21	
Exports	0.00	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Net Imports	0.16	0.12	0.15	0.21	0.18	0.17	0.16	0.18	0.20	0.20	0.18	0.20	0.20	
Primary Stocks of Finished Motor Gasolines² (million barrels)														
Opening	213.54	203.47	198.82	177.84	191.33	203.47	202.54	183.71	184.03	180.77	202.54	192.66	201.79	
Closing	203.47	198.82	177.84	191.33	194.44	194.44	183.71	184.03	180.77	192.66	192.66	201.79	197.10	
Net Withdrawals (million barrels per day)	0.03	0.05	0.23	-0.15	-0.03	0.02	0.21	-0.00	0.04	-0.13	0.03	-0.10	0.05	
Total Primary Supply	6.58	6.21	6.78	6.65	6.50	6.53	6.29	6.57	6.54	6.33	6.43	6.05	6.36	
Disposition														
Leaded	3.33	3.02	3.30	3.16	3.07	3.14	2.88	2.89	2.82	2.67	2.81	2.50	2.57	
Unleaded	3.26	3.19	3.49	3.49	3.43	3.40	3.41	3.67	3.72	3.66	3.62	3.55	3.79	
Total Product Supplied	6.59	6.21	6.78	6.65	6.50	6.54	6.29	6.57	6.54	6.33	6.43	6.05	6.36	
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	6.58	6.21	6.78	6.65	6.50	6.53	6.29	6.57	6.54	6.33	6.43	6.05	6.36	

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: Energy Information Administration, 1981 Petroleum Supply Annual, and Petroleum Supply Monthly, April 1983. Historical data for March 1983 are preliminary.

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

	History				Projections			
	1981		1982		1983		1984	
	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply								
Refinery Output	2.61	2.45	2.57	2.64	2.78	2.61	2.41	2.90
Imports	0.17	0.09	0.08	0.09	0.12	0.09	0.07	0.07
Exports	0.01	0.09	0.06	0.07	0.08	0.07	0.06	0.06
Net Imports	0.17	0.00	0.01	0.02	0.04	0.02	-0.06	0.00
Primary Stocks Levels¹ (million barrels)								
Opening	205.37	191.54	127.73	124.55	161.19	191.54	185.58	177.70
Closing	191.54	127.73	124.55	161.19	178.60	118.72	121.53	177.70
Net Withdrawals	0.04	0.11	0.03	-0.40	-0.19	0.04	0.74	-0.61
(million barrels per day)								
Total Primary Supply	2.82	3.16	2.62	2.26	2.64	2.67	2.83	2.38
Product Supplied								
Nonutility Shipments	2.78	3.10	2.60	2.24	2.62	2.64	2.80	2.34
Electric Utility Shipments	0.05	0.05	0.03	0.03	0.02	0.03	0.03	0.04
Total Product Supplied	2.83	3.16	2.63	2.27	2.64	2.67	2.83	2.38
Electric Utility Consumption	0.06	0.07	0.03	0.04	0.03	0.04	0.03	0.05
Electric Utility Stock Levels (million barrels)								
Opening	30.02	26.09	25.14	24.65	24.22	26.09	23.37	22.81
Closing	26.09	25.14	24.65	24.22	23.37	23.20	22.81	22.47
Net Additions	-0.01	-0.01	-0.01	-0.00	-0.01	-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
Unaccounted for	-0.01	0.00	-0.01	-0.01	0.00	-0.00	0.00	0.00
Total Disposition	2.82	3.16	2.62	2.26	2.64	2.67	2.83	2.38

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: Energy Information Administration, 1981 Petroleum Supply Annual, the Petroleum Supply Monthly, April 1983, the Monthly Energy Review, May 1983, the Electric Power Monthly, March 1983. All other historical data for March 1983 are preliminary.

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

	History							Projections						
	1981		1982					1983		1984				
	Year		1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply														
Refinery Output	1.32	1.15	1.12	1.01	0.98	1.06	0.88	1.02	1.02	1.09	1.00	1.12	1.12	1.11
Imports	0.80	0.88	0.71	0.65	0.78	0.76	0.67	0.76	0.84	0.84	0.78	1.11	0.94	
Exports	0.12	0.22	0.21	0.21	0.20	0.21	0.22	0.20	0.20	0.20	0.21	0.24	0.24	
Net Imports	0.68	0.67	0.50	0.44	0.58	0.55	0.45	0.55	0.64	0.63	0.57	0.87	0.87	0.69
Primary Stocks Levels¹ (million barrels)														
Opening	91.50	77.99	57.35	60.55	61.82	77.99	68.23	46.31	51.16	55.27	68.23	.54.29	.55.02	.55.02
Closing	77.99	57.35	60.55	61.82	66.18	66.18	46.31	51.16	55.27	54.29	54.29	.55.02	.55.19	
Net Withdrawals	0.04	0.23	-0.04	-0.01	-0.05	0.03	0.24	-0.05	-0.04	0.01	0.04	-0.01	-0.01	-0.00
Total Primary Supply	2.04	2.05	1.59	1.45	1.51	1.64	1.57	1.52	1.61	1.73	1.61	1.98	1.98	1.80
Product Supplied														
Nonutility Shipments	1.19	1.28	1.08	0.87	1.05	1.07	1.04	0.97	0.97	1.07	1.01	1.28	1.14	
Electric Utility Shipments	0.89	0.82	0.56	0.62	0.50	0.62	0.53	0.55	0.64	0.66	0.60	0.71	0.66	
Total Product Supplied	2.09	2.10	1.64	1.49	1.55	1.70	1.57	1.52	1.61	1.73	1.61	1.98	1.80	
Electric Utility Consumption	0.90	0.87	0.55	0.52	0.53	0.64	0.68	0.53	0.63	0.67	0.63	0.80	0.62	
Electric Utility Stock Levels (million barrels)														
Opening	105.35	102.04	97.71	97.96	98.16	102.04	95.51	81.63	83.41	85.18	95.51	84.18	75.82	
Closing	102.04	97.71	97.96	98.16	95.51	95.51	81.63	83.41	85.18	84.18	84.18	75.82	79.46	
Net Additions	-0.01	-0.05	0.00	0.00	-0.03	-0.02	-0.15	0.02	0.02	-0.01	-0.03	-0.09	0.04	
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	0.00
Unaccounted for	-0.05	-0.06	-0.05	-0.05	-0.05	-0.05	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
Total Disposition	2.04	2.05	1.59	1.45	1.51	1.64	1.57	1.52	1.61	1.73	1.61	1.98	1.98	1.80

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: Energy Information Administration, 1981 Petroleum Supply Annual, the Petroleum Supply Monthly, April 1983, the Monthly Energy Review, May 1983, the Electric Power Monthly, March 1983. All other historical data for March 1983 are preliminary.

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

	History						Projections							
	1981		1982		1983		1984		1st		2nd			
Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	1st	2nd
Supply														
Marketed Production of Dry Gas ¹	19.18	4.73	4.40	4.22	4.21	17.55	4.20	4.13	4.13	4.27	16.74	4.40	4.31	
Net Imports of Dry Gas	0.86	0.28	0.20	0.19	0.25	0.91	0.27	0.21	0.20	0.25	0.93	0.26	0.21	
Net Imports of LNG	-0.02	-0.01	-0.00	-0.01	0.01	0.00	0.03	0.03	0.03	0.03	0.13	0.03	0.03	
SNG Production	0.13	0.04	0.02	0.02	0.03	0.12	0.03	0.02	0.02	0.03	0.11	0.04	0.02	
Total New Supply	20.16	5.04	4.62	4.42	4.50	18.59	4.54	4.40	4.38	4.59	17.91	4.73	4.58	
Underground Storage														
Opening	6.30	6.57	5.37	6.15	7.03	6.57	6.88	5.96	6.50	7.31	6.88	7.14	5.92	
Closing	6.57	5.37	6.15	7.03	6.88	6.88	5.96	6.50	7.31	7.14	7.14	5.92	6.43	
Net Withdrawals	-0.27	1.20	-0.78	-0.89	0.15	-0.31	0.91	-0.54	-0.81	0.17	-0.26	1.22	-0.51	
Total Primary Supply ¹	19.89	6.24	3.85	3.54	4.65	18.28	5.45	3.86	3.57	4.76	17.64	5.95	4.07	
Consumption														
Electric Utilities	3.64	0.70	0.80	1.01	0.71	3.23	0.59	0.92	1.09	0.77	3.37	0.91	1.07	
Refinery Fuel	0.65	0.15	0.16	0.17	0.16	0.64	0.14	0.15	0.16	0.17	0.63	0.16	0.16	
All Other Uses ²	15.11	5.30	2.77	2.26	3.67	14.01	4.63	2.68	2.22	3.72	13.25	4.79	2.73	
Subtotal	19.41	6.16	3.73	3.44	4.55	17.87	5.36	3.75	3.47	4.66	17.24	5.86	3.96	
Unaccounted for	0.48	0.09	0.11	0.10	0.10	0.41	0.09	0.11	0.10	0.10	0.40	0.09	0.11	
Total Disposition	19.89	6.24	3.85	3.54	4.65	18.28	5.45	3.86	3.57	4.76	17.64	5.95	4.07	

LNG=Liquefied Natural Gas.

SNG=Synthetic Natural Gas.

¹Excludes nonhydrocarbon gases removed.

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

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

Sources: Energy Information Administration, Monthly Energy Review, May 1983,

U.S. Imports and Exports of Natural Gas, 1981, June 1982, and Electric Power Monthly, March 1983.

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

	History							Projections						
	1981		1982					1983		1984				
	Year	1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd	
Supply														
Production.....	823.77	220.91	215.96	200.18	196.35	833.41 ^a	187.43 ^b	195.00	194.62	209.79	786.84	204.04	215.65	
Primary Stock Levels ^a														
Opening.....	24.38	24.15	33.47	37.54	39.69	24.15	36.78	34.90	29.35	23.29	36.78	25.44	26.40	
Closing.....	24.15	33.47	37.54	39.69	36.78	36.78	34.90 ^b	29.35	23.29	25.44	25.44	26.40	27.12	
Net Withdrawals.....	.23	-9.33	-4.07	-2.14	2.90	-12.63 ^a	1.88 ^b	5.55	6.05	-2.14	11.35	-0.96	-0.72	
Imports.....	1.04	0.11	0.13	0.27	0.23	0.74	0.27	0.16	0.12	0.13	0.68	0.10	0.15	
Exports.....	112.54	25.56	31.62	25.25	23.84	106.28 ^a	15.14	25.67	23.66	25.97	90.44	18.04	28.50	
Total Domestic Supply ...	712.51	186.13	180.40	173.06	175.64	715.24	174.44 ^b	175.05	177.13	181.81	708.43	185.14	186.57	
Secondary Stock Levels^c														
Opening.....	204.03	185.27	179.17	198.37	189.97	185.27	195.25	193.56	203.58	190.16	195.25	186.79	182.39	
Closing.....	185.27	179.17	198.37	189.97	195.25	195.25	193.56 ^b	203.58	190.16	186.79	186.79	182.39	190.80	
Net Withdrawals.....	18.75	6.10	-19.20	8.41	-5.29	-9.98 ^a	1.70	-10.02	13.42	3.37	8.47	4.40	-8.41	
Total Indicated Consumption ...	731.26	192.24	161.20	181.47	170.35	705.26	176.13 ^b	165.03	190.55	185.19	716.90	189.53	178.16	
Domestic Consumption														
Coke Plants.....	61.01	12.96	10.81	9.10	8.04	40.91	6.98 ^b	10.00	11.25	11.91	40.15	12.28	14.02	
Electric Utilities.....	596.80	153.59	136.54	158.50	145.04	593.66	146.16 ^b	137.82	162.72	153.24	599.94	155.81	145.95	
Retail and General Industry..	74.82	20.17	16.70	16.58	19.01	72.46	20.09 ^b	17.21	16.57	20.03	73.91	21.45	18.19	
Total Domestic Consumption	732.63	186.71	164.05	184.18	172.09	707.03 ^a	173.24 ^b	165.03	190.55	185.19	714.00	189.53	178.16	
Discrepancy ^d	-1.37	5.53	-2.85	-2.71	-1.73	-1.77	2.90 ^b	0.00	0.00	0.00	2.90	0.00	0.00	

^a

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

^b Estimated.^c

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

^d

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

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

Sources: Energy Information Administration, Monthly Energy Review, May 1983, and Quarterly Coal Report, April 1983.

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

	1981 Year	History						Projections						1984 1st	1984 2nd
		1st	2nd	1982 3rd	4th	Year	1st	2nd	1983 3rd	4th	Year	1st	2nd		
Generation															
Coal	1203.20	307.65	276.43	317.64	290.29	1192.00	296.45	279.42	329.90	310.68	1216.45	315.89	295.89		
Petroleum	206.42	49.39	31.48	35.50	30.44	146.80	38.02	30.43	35.86	38.77	163.09	45.90	35.28		
Natural Gas	345.78	67.14	75.48	95.41	67.23	305.26	56.06	66.62	2102.08	72.01	316.76	85.24	100.42		
Nuclear	272.67	68.62	67.45	75.84	70.86	282.77	71.19	65.23	79.60	77.56	293.67	78.44	73.00		
Hydroelectric	260.68	83.47	83.85	71.08	70.81	309.21	87.57	87.48	69.29	66.40	310.75	72.37	76.21		
Geothermal and Other ¹	6.05	1.12	1.17	1.43	1.44	5.16	1.36	1.45	1.60	1.62	6.02	1.57	1.55		
Total Generation	2294.81	577.39	535.85	596.90	531.06	2241.21	550.66	550.65	618.33	567.03	2286.67	599.42	582.37		
Total Net Imports	31.67	7.80	7.89	7.99	7.99	31.67	7.80	5.65	5.68	5.68	24.80	5.87	5.65		
T & D Loss ²	147.71	28.74	44.03	45.30	36.89	154.97	30.18	36.34	40.81	37.42	149.75	39.56	38.44		
Total Consumption (Sales) ...	2147.10	548.65	491.82	551.60	494.17	2086.24	520.48	514.30	577.52	529.61	2141.91	559.86	543.93		

¹Includes wood and waste.

²Transmission and distribution losses through the power network, calculated as total generation minus total sales.

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

Source: Energy Information Administration, Monthly Energy Review, May 1983,
and Electric Power Monthly, March 1983.

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

	History							Projections						
	1981		1982					1983		1984				
	Year		1st	2nd	3rd	4th	Year	1st	2nd	3rd	4th	Year	1st	2nd
Supply														
Production														
Petroleum ¹	20.45	5.06	5.12	5.19	5.21	20.59	5.08	5.14	5.17	5.16	20.56	5.09	5.07	
Natural Gas ²	19.70	4.86	4.52	4.33	4.32	18.03	4.32	4.24	4.24	4.39	17.19	4.52	4.43	
Coal	18.44	4.94	4.83	4.48	4.39	18.65	4.19	4.36	4.36	4.70	17.61	4.57	4.83	
Nuclear	2.97	0.75	0.74	0.83	0.77	3.08	0.78	0.71	0.87	0.85	3.20	0.86	0.80	
Hydroelectric ³	2.74	0.88	0.88	0.75	0.74	3.25	0.92	0.73	0.70	3.26	0.76	0.80		
Geothermal and Other ⁴	0.13	0.02	0.03	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.13	0.03	0.03	
Subtotal	64.44	16.52	16.11	15.61	15.47	63.71	15.32	15.40	15.40	15.83	61.96	15.83	15.96	
Net Imports														
Crude Oil	8.85	1.50	1.65	1.95	1.73	6.85	1.21	1.72	2.05	2.03	7.01	1.85	2.10	
Other Petroleum	2.61	0.57	0.47	0.52	0.56	2.11	0.38	0.47	0.56	0.60	2.00	0.81	0.57	
Natural Gas (Dry)	0.88	0.28	0.20	0.19	0.25	0.93	0.27	0.22	0.20	0.26	0.95	0.27	0.22	
Liquefied Natural Gas	-0.02	-0.01	-0.00	-0.01	0.01	0.00	0.03	0.03	0.03	0.03	0.13	0.03	0.03	
Coal and Coke	-2.94	-0.67	-0.83	-0.66	-0.62	-2.79	-0.40	-0.67	-0.62	-0.68	-2.37	-0.48	-0.75	
Electricity	0.33	0.08	0.08	0.08	0.08	0.33	0.08	0.06	0.06	0.06	0.26	0.06	0.06	
Subtotal	9.71	1.76	1.57	2.08	2.02	7.43	1.58	1.82	2.28	2.30	7.98	2.54	2.23	
Primary Stocks														
Net Withdrawals	0.11	1.78	-0.54	-1.13	0.13	0.24	1.51	-0.41	-1.10	0.53	0.56	1.16	-0.70	
SPR Fill Rate Additions(-)	-0.71	-0.11	-0.09	-0.08	-0.09	-0.37	-0.10	-0.13	-0.14	-0.08	-0.45	-0.08	-0.08	
Utility Stocks ⁵														
Net Withdrawals	0.46	0.17	-0.41	0.18	-0.09	-0.15	0.13	-0.22	0.28	0.08	0.26	0.15	-0.20	
Total Supply ⁶	74.01	20.12	16.64	16.66	17.44	70.86	18.43	16.46	16.71	18.66	70.30	19.59	17.21	
Consumption														
Nonutility Uses														
Petroleum	29.73	7.27	7.23	7.03	7.25	28.77	7.02	6.88	7.05	7.51	28.47	7.47	7.28	
Natural Gas ⁷	16.19	5.60	3.01	2.50	3.94	15.04	4.90	3.09	2.40	4.40	14.78	4.91	3.01	
Coal	3.37	0.82	0.68	0.67	0.70	2.87	0.67	0.67	0.69	0.79	2.82	0.84	0.80	
Subtotal	49.29	13.69	10.92	10.20	11.88	46.68	12.59	10.64	10.14	12.71	46.08	13.21	11.09	
Electric Utility Inputs														
Petroleum	2.20	0.53	0.34	0.38	0.33	1.57	0.40	0.33	0.39	0.42	1.54	0.50	0.38	
Natural Gas	3.74	0.72	0.82	1.03	0.73	3.31	0.61	0.95	1.12	0.79	3.46	0.93	1.10	
Coal	12.59	3.24	2.88	3.34	3.06	12.52	3.11	2.94	3.47	3.26	12.78	3.32	3.11	
Nuclear	2.97	0.75	0.74	0.83	0.77	3.08	0.78	0.71	0.87	0.85	3.20	0.86	0.80	
Hydroelectric ⁸	3.07	0.96	0.96	0.83	0.83	3.58	1.00	0.98	0.79	0.76	3.52	0.82	0.86	
Geothermal and Other	0.13	0.02	0.03	0.03	0.03	0.11	0.03	0.03	0.03	0.03	0.13	0.03	0.03	
Subtotal	24.83	6.22	5.76	6.44	5.78	24.17	5.93	5.93	6.66	6.11	24.63	6.46	6.28	
Gross Energy Consumption ⁹	73.99	19.91	16.68	16.63	17.63	70.85	18.52	16.57	16.80	18.82	70.71	19.67	17.36	
Electric Utility Adjustments														
Conversion Loss ⁷	16.88	4.25	3.93	4.41	3.96	16.53	4.02	4.03	4.53	4.15	16.73	4.39	4.27	
Total Net Energy	57.40	15.69	12.78	12.22	13.70	54.38	14.49	12.54	12.27	14.67	53.98	15.28	13.10	
Unaccounted for	0.02	0.19	-0.04	0.03	-0.19	0.01	-0.09	-0.11	-0.09	-0.16	-0.41	-0.08	-0.15	
Total Disposition	74.01	20.12	16.64	16.66	17.64	70.86	18.43	16.46	16.71	18.66	70.30	19.59	17.21	

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 natural gas used as refinery fuel.

⁶Includes all secondary coal stocks.

⁷Includes plant use.

⁸This total excludes approximately 2 quadrillion Btu of wood.

⁹Includes industrial hydroelectric production and net imports of electricity.

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: Energy Information Administration, Monthly Energy Review, May 1983, and Electric Power Monthly, March 1983.

See note above.

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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		
Coke		Btu Out/Btu In
Synthetic Gas		0.68
		0.95

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