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Contents

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Preface

The Energy Information Administration (EIA) prepares quarterly, short-term energy supply, demand, and price projections for publication in February, May, August, and November in the *Short-Term Energy Outlook* (*Outlook*). An annual supplement analyzes the performance of previous forecasts, compares recent cases with those of other forecasting services, and discusses current topics related to the short-term energy markets. (See *Short-Term Energy Outlook Annual Supplement*, DOE/EIA-0202.)

The forecast period for this issue of the *Outlook* extends from the fourth quarter of 1994 through the fourth quarter of 1995. Values for the third quarter of 1994, however, are preliminary EIA estimates (for example, some monthly values for petroleum supply and disposition are derived in part from weekly data reported in the *Weekly Petroleum Status Report*) or are calculated from model simulations using the latest exogenous information available (for example, electricity sales and generation are simulated using actual weather data). The historical energy data, compiled into the fourth quarter 1994 version of the Short-Term Integrated Forecasting System (STIFS) database, are mostly EIA data regularly published in the *Monthly Energy Review*, *Petroleum Supply Monthly*, and other EIA publications. Minor discrepancies between the data in these publications and the historical data in this *Outlook* are due to independent rounding. The STIFS database is archived quarterly and is available from the National Technical Information Service.

The cases are produced using the Short-Term Integrated Forecasting System (STIFS). The STIFS model is driven principally by three sets of assumptions or inputs: estimates of key macroeconomic variables, world oil price assumptions, and assumptions about the severity of weather. Macroeconomic estimates are produced by DRI/McGraw-Hill but are adjusted by EIA to reflect EIA assumptions about the world price of crude oil, energy product prices, and other assumptions which may affect the macroeconomic outlook. The EIA model is available on computer tape from the National Technical Information Service.

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Treatment of Petroleum Supply Monthly Reporting Change

The Energy Information Administration began reporting the series "Motor Gasoline Product Supplied" (equated in this report with gasoline demand) on a new basis for monthly data for January 1993 forward. These new-basis data are included in this issue of the *Outlook*. The reporting changes reflect data relating to fuel ethanol blended into gasoline as well as certain changes in product classification affecting reported motor gasoline quantities. Beginning with the fourth quarter 1993 edition of the *Outlook*, any references to data series affected by these changes are, for periods prior to 1993, strictly in terms of the new-basis definition. Thus, history for motor gasoline and miscellaneous product demands were restated so as to make comparisons as consistent as possible. Appendix B from the third quarter 1993 *Outlook* provides details on the significance of the data restatement.

Contents

Contents

Tables

Figures

Highlights

Note: The data referenced may be found in Table 1 or in the tables located in the back of this report.

Crude Oil and Product Prices Recede in Third Quarter 1994, Continue Rising Trend in 1995

Crude oil prices rose quickly in the second and third quarters of 1994, due in part to the uncertainty of Nigerian production. After stabilization of the Nigerian situation in September, crude oil prices receded. Iraq's troop movements towards the Kuwait border in early October resulted in a small, temporary increase in oil prices, with no change in market fundamentals. From here, market fundamentals point to an upward track for crude oil prices, which are expected to rise slowly to $18 by year-end 1995.

Winter Fuels Demand Likely to Diminish Versus 1993-1994 Heating Season

Barring a return of unusually cold weather patterns, the most likely scenario is for weaker heating fuel demand this winter compared to last year. Natural gas demand, which is experiencing solid growth overall, is expected to exhibit some weakness this winter compared to last year due to subdued expectations for residential demand under normal weather conditions. Fuel oil prices are expected to rise from last winter's level, but only because of expected higher crude oil prices.

U.S. Oil Demand Expected to Rise 2.5 Percent in 1994, Low Growth Seen for 1995

For the year 1994, robust economic growth, lower oil prices, and the extreme winter weather experienced in January and February, will help boost total petroleum demand by an expected 430,000 barrels per day, or 2.5 percent, in the United States. In 1995, slower economic growth, firmer product prices and assumed normal weather patterns are expected to slow domestic demand growth to 60,000 barrels per day.

Electricity Demand in 1994 Solid Despite Cool Summer Weather

Electricity demand growth is expected to continue to rise steadily in 1994 and 1995. First-half 1994 demand growth has exceeded expectations despite relatively low cooling degree day estimates.

Natural Gas Demand for Generation of Electricity Growing Fastest

Natural gas demand associated with increased output of electricity (by electric utilities and industrial cogenerators) accounts for the bulk of the nearly 1.2 trillion cubic feet of increased natural gas use expected (under base conditions) for the 1993 to 1995 period. In 1994, utility gas demand is expected to rise by 8.0 percent, and by an additional 3.5 percent in 1995. Demand for gas by nonutility generators is projected to expand even faster, at a rate of 9.6 percent in 1994 and 6.2 percent in 1995.

Coal Demand Increases Driven by Electricity Demand

Total coal consumption is expected to increase by 2.2 percent in 1994. Growth in electricity demand will be the only major source of growth in coal demand. Coal production gained about 35 million tons over first-half 1993 levels and is expected to increase a total of almost 80 million tons for all of 1994.

Table 1. U.S. Energy Supply and Demand Summary

	Price Case [a]	Year				Annual Percentage Change		
		1992	1993	1994	1995	1992-1993	1993-1994	1994-1995
Real Gross Domestic Product (GDP) (billion 1987 dollars)	Mid	4979	5135	5323	5435	3.1	3.7	2.1
Imported Crude Oil Price (nominal dollars per barrel)	Low			15.05	13.00		-6.7	-13.6
	Mid	18.20	16.13	15.68	17.27	-11.4	-2.8	10.2
	High			16.24	19.90		0.7	22.5
Petroleum Supply								
Crude Oil Production [b] (million barrels per day)	Low			6.61	6.21		-3.4	-6.1
	Mid	7.17	6.85	6.65	6.52	-4.5	-2.8	-2.0
	High			6.70	6.78		-2.2	1.2
Total Petroleum Net Imports (including SPR) (million barrels per day)	Low			8.05	8.58		5.6	6.6
	Mid	6.94	7.62	7.99	8.12	9.8	4.9	1.6
	High			7.94	7.78		4.2	-2.0
Energy Demand								
World Petroleum (million barrels per day)	Mid	66.81	67.13	68.09	68.99	0.5	1.4	1.3
U.S. Petroleum (million barrels per day)	Low			17.68	17.88		2.6	1.1
	Mid	17.10	17.24	17.67	17.73	0.8	2.5	0.3
	High			17.66	17.64		2.4	-0.1
Natural Gas (trillion cubic feet)	Low			20.97	21.30		3.3	1.6
	Mid	19.54	20.30	20.98	21.45	3.8	3.4	2.2
	High			20.99	21.55		3.4	2.6
Coal (million short tons)	Mid	892	926	946	954	3.8	2.2	0.9
Electricity [c] (billion kilowatthours)	Mid	2763	2862	2955	3009	3.6	3.3	1.8
Gross Energy [d] (quadrillion Btu)	Mid	85.2	87.1	89.2	90.2	2.3	2.4	1.2
Gross Energy Demand per Dollar of GDP (thousand Btu per 1987 Dollar)	Mid	17.10	16.96	16.75	16.60	-0.8	-1.2	-0.9
Renewable Energy as Percent of Total	Mid	7.1	7.3	7.3	7.5			

[a] Refers to the imported cost of crude oil to U.S. refiners assumed for the scenario depicted. In all cases on this table, the mid macroeconomic case and normal weather are used.

[b] Includes lease condensate.

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

[d] The gross energy concept shown here is revised to match that presented in Energy Information Administration, *Annual Energy Review 1993 (AER)*, DOE/EIA-0384(93), Table 10.1. The conversion from physical units to Btu is calculated using a subset of conversion factors used in the calculations performed for gross energy consumption in Energy Information Administration, *Monthly Energy Review (MER)*. Consequently, the historical data may not precisely match that published in the *MER* or the *AER*.

SPR: Strategic Petroleum Reserve.

Notes: Minor discrepancies with other published EIA historical data are due to independent rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); *Petroleum Supply Monthly*, DOE/EIA-0109(94/09); *Petroleum Supply Annual 1993*, DOE/EIA-0340(93)/2; *Natural Gas Monthly*, DOE/EIA-0130(94/08); *Electric Power Monthly*, DOE/EIA-0226(94/08); and *Quarterly Coal Report*, DOE/EIA-0121(94/2Q). Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0994.

Feature Article

1994-1995 Winter Fuels Outlook

by Michael Morris

This article summarizes the fuel demand and supply projections for the winter season, and compares them to the 1993-1994 winter experience. For the purposes of this analysis, winter is defined as the period from October 1 through March 31. In order to help put the upcoming heating season in better perspective, an alternative winter scenario involving a 10-percent-colder-than-normal first quarter 1995 is examined. Some qualitative analysis of unpredictable factors that may affect the winter fuels market is offered.

The Base Case Outlook

Assumptions

The base case for the October to March heating season, along with the colder winter scenario and the 1993-1994 results, is summarized in Table FE1 below. The outlook starts with the assumption that normal weather conditions (meaning average 1961-1990 heating degree-day patterns) will hold. Under this assumption, the weather for the Lower-48 States, on a population-weighted basis, is projected to be 4 percent milder than during the winter of 1993-1994. In the northeastern United States, the principal home heating oil market, the weather is expected to be 8 percent warmer than the last winter season. The predominant residential propane market, the North-Central region, is expected to experience a 4-percent heating degree-day decline compared to the winter of 1993-1994.

Real gross domestic product during the winter of 1994-1995 is projected to be 2.9 percent higher than the previous winter in the base case, while manufacturing production is expected to post a 4.9-percent gain over the same period. Base case assumptions concerning world oil markets lead to

a projected 1994-1995 winter average crude oil price of $16.50 per barrel compared to $13.55 per barrel during the previous winter. Despite these developments, increases in product prices are projected to have little or no effect on demand.

Demand

Winter-season oil consumption, which increased 460,000 barrels per day last year largely as a result of the cold weather,[1] is expected to grow much more slowly during the upcoming winter (about 100,000 barrels per day in the base case). Distillate fuel oil consumption is projected to decline slightly as weather-related declines in residential, commercial, and industrial use offset increases in transportation demand. The combined effects of normal weather and secular (fuel-switching) trends are expected to result in 30,000 and 70,000 barrels-per-day declines in residual fuel oil and liquefied petroleum gas (LPG) demand, respectively.

Winter natural gas demand, which rose 3.8 percent in 1993-1994,[2] is projected to increase by only 0.4 percent as a result of the weather-related decline in residential and commercial demand. Utility and industrial demand are expected to increase relative to last winter, as spot gas volumes should be available in greater quantities and at more favorable prices than last year if weather is normal.

Electricity demand, which grew by 2.9 percent last winter,[3] is relatively less affected by year-to-year changes in winter weather, and is projected to increase 3.9 percent. Half of that increase, however, is attributed to the rapidly growing commercial sector (Table 13).

Feature Article

Table FE1. Winter Fuels Outlook Summary

	1993-1994			1994-1995 Winter Scenarios					
				Base Case			10% Colder Than Normal		
	Q4	Q1	Winter	Q4	Q1	Winter	Q4	Q1	Winter
Assumption									
Real Gross Domestic Production									
Billion 1987 Dollars (Ann. Rate)	5218	5261	5240	5377	5402	5390	5377	5402	5390
Manufacturing Production									
(Index, 1987=1.000)	1.141	1.163	1.152	1.206	1.210	1.208	1.206	1.210	1.208
Heating Degree-Days									
U.S.	1706	2438	4144	1636	2327	3962	1636	2559	4195
Northeast [b]	2170	3428	5599	2089	3064	5153	2089	3370	5460
Gas-Weighted [c]	1733	2496	4229	1686	2426	4112	1686	2669	4355
Demand									
Total Petroleum (MMBD)	17.68	17.82	17.75	17.86	17.83	17.84	17.86	18.06	17.96
Distillate Fuel (MMBD)	3.19	3.53	3.35	3.21	3.45	3.33	3.21	3.57	3.39
Residual Fuel (MMBD)	1.18	1.24	1.21	1.16	1.19	1.18	1.16	1.24	1.20
Liquefied Petroleum Gas (MMBD) . .	1.93	2.10	2.01	1.94	1.94	1.94	1.94	2.01	1.97
Total Natural Gas (BCFD)	58.10	76.60	67.25	59.01	76.04	67.43	59.01	79.26	69.02
Total Electricity (BKWHD)	7.51	8.14	7.82	7.91	8.31	8.11	7.91	8.39	8.15
Petroleum Fuel Supply									
Distillate									
Ref. Production	3.43	3.08	3.26	3.21	2.92	3.07	3.21	2.92	3.07
Net Imports	-0.14	-0.01	-0.08	0.04	0.04	0.04	0.04	0.05	0.04
Stock Draw	-0.10	0.46	0.17	-0.04	0.50	0.22	-0.04	0.61	0.28
Residual Fuel									
Ref. Production	0.87	0.84	0.85	0.87	0.87	0.87	0.87	0.88	0.88
Net Imports	0.32	0.37	0.35	0.32	0.26	0.29	0.32	0.28	0.30
Stock Draw	-0.03	0.03	0.00	-0.04	0.00	-0.02	-0.04	0.01	-0.01
Price									
Imported Crude Oil (DPB) [d]	14.09	13.01	13.59	16.50	16.50	16.50	16.50	16.50	16.50
Residential Heating Oil (CPG)	87.7	90.3	89.2	90.3	94.4	92.8	90.3	97.7	94.9
Retail Residual Fuel (CPG)	30.3	33.8	32.1	34.5	35.9	35.2	34.5	36.2	35.3
Natural Gas Wellhead (DPMCF)	2.03	2.06	2.04	2.01	1.96	1.99	2.01	2.01	2.01
Residential Natural Gas (DPMCF) . .	6.22	6.05	6.12	6.22	6.05	6.12	6.22	6.06	6.12
Residential Electricity (CPKWH)	8.3	7.9	8.1	8.4	8.2	8.3	8.4	8.2	8.3

[a] Population-weighted degree days (except for gas-weighted figures). A degree day indicates the temperature variation from 65 degrees Fahrenheit (calculated as the simple average of the daily minimum and maximum temperatures) weighted by 1990 population. Normal level, as is used for the base case, is defined as the average number of degree days between 1961 and 1990 for a given period.

[b] Northeast heating degree-days covers the Mid Atlantic and New England Census Divisions.

[c] Gas-weighted heating degree-days refers to a national composite derived by weighting state degree-day averages to a national level, with the proportion of gas-heated homes in states, relative to the national total, serving as the weights.

[d] Refers to the cost of imported crude oil to U.S. refiners.

Notes: MMBD=million barrels per day; BCFD=billion cubic feet per day; BKWHD=billion kilowatthours per day; DPB=dollars per barrel; CPG=cents per gallon; DPMCF=dollars per thousand cubic feet; CPKWH-cents per kilowatthour.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); *Petroleum Supply Monthly*, DOE/EIA-0190(94/09); *Petroleum Supply Annual 1993*, DOE/EIA-0340(93)/2; *Natural Gas Monthly*, DOE/EIA-0130(94/08); *Electric Power Monthly*, DOE/EIA-0226(94/08). Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0994.

Feature Article

Supply

The outlook for fuel oil supply points to a likely increase in the importance of net imports of product to meet winter demand. In the case of distillate fuel, domestic suppliers are expected to move from a net export position to a small net import position this winter. With over 100,000 barrels per day increased demand expected for non-heating distillate fuels compared with last winter, it is assumed that somewhat less of a supply cushion from domestic refiners will be available from current production. In fact, pre-season buildup of inventories of heating oil to abnormally high levels points to a likely added emphasis on stockdraw during peak demand periods as well, even in the base case. Relative marginal profitability to refiners will ultimately determine yields, but, with relative margins for distillate fuel oil likely to fall from the lofty first-quarter 1994 levels this winter, base case projections result in somewhat lower domestic output for distillate fuel. High fuel prices abroad during peak demand periods in the United States, however, could change this equation.

Prices

Because crude oil prices are currently higher than last winter, most heating fuel prices are projected to rise. Many of these increases, however, are expected to lag the underlying inflation rate. Distillate fuel inventories that started the season well above normal levels present the possibility of significant downside price potential for heating oil, especially if autumn temperatures are mild. For the base case, retail heating oil prices are expected to increase by less than 4 cents per gallon for the winter over last year's level. Since crude oil prices are expected to rise by about 7 cents per gallon (3 dollars per barrel), aggregate gross margins for heating oil are expected to slip from last year's elevated levels. A similar pattern appears to hold for residual fuel oil prices.

For natural gas, wellhead prices appear likely to fall this winter from the same period last year, while residential prices should remain stable. Natural gas prices came under unexpectedly strong downward pressure at summer's end due to relatively high domestic inventories and the rapidly increasing availability of Canadian imports. These factors are expected to assist a reduction in weather-related winter demand, keeping wellhead prices relatively low compared to last winter.

Alternative Weather Scenario

While the stage appears to be set for a subdued and manageable heating season, the experience of last winter argues for consideration of the effects of more severe weather. Thus, a colder-than-normal winter weather pattern is examined here and qualitative discussion is offered for other factors that may argue against a too-complacent view of the outlook for winter fuels.

The alternative weather case is designed to determine how the overall winter fuel market balance would change under the assumption of winter weather being colder than that assumed in the base case. It assumes that heating degree-days (in all regions) are 10 percent above the base case assumptions in the first quarter of 1995. As such, this scenario assumes a uniformly colder winter throughout that period and hence does not reflect a winter characterized by extremes in temperature. Summary results are reported in Table FE1.

Demand

First-quarter demand for all of the heating fuels would be expected to rise. Distillate consumption would increase 110,000 barrels per day, but that would be only 40,000 barrels per day above the first quarter of 1994. Residual fuel demand would rise 50,000 barrels per day to levels similar to that of the previous winter. Propane consumption would increase by 70,000 barrels per day. This would still be 80,000 barrels per day less than in the previous first quarter. Natural gas demand and electricity consumption in the first quarter

Feature Article

would rise by 4 and 3 percent compared to the base case.

Supply

For petroleum products, the additional severe-winter requirement is presumed to be supplied from primary inventories, as indicated in the Table. The first-quarter distillate stock drawdown would average 610,000 barrels per day compared to 500,000 barrels per day in the base case. But that would be substantially less than the record 740,000 barrels per day drawdown observed last January, and would still leave end-of-season inventories above the most recent 3-year low of 92.1 million barrels recorded in April 1992.[4] Also, the 100,000 barrels-per-day average drawdown for residual fuel (compared to 50,000 barrels per day in the base case) would still be less than the 152,000 barrels per day seen last February.

For natural gas, the projected first-quarter consumption would be approximately 94 percent

of maximum sustainable deliverability of about 85 billion cubic feet per day, assuming a uniformly colder winter.[5] This, however, represents a national average and does not account for spot shortages that may occur in times of sudden weather fluctuations.

Prices

Retail product price responses to severe-weather requirements would be muted. Petroleum price behavior assumes that crude oil prices would remain unchanged, allowing for increased refinery margins. Distillate prices would experience the largest percentage price increase because of the lack of fuel-switching capability on the part of residential customers. Residential natural gas price hikes are subject to regulation and would be small and spread over several months, limiting average price hikes for the first quarter. Because petroleum products and natural gas constitute a small part of the baseload, electricity prices would remain almost unchanged in a severe-winter case.

Introducing the EIA's Short-Term Energy Model for the Personal Computer

The Short-Term Energy Model Icon

Concurrent with release of the fourth quarter 1994 *Short-Term Energy Outlook*, the Energy Information Administration (EIA) is releasing a new information tool, designed to bring the data, assumptions and modeling capability used to produce its short-term forecasts onto the desktops of energy analysts and energy information clients everywhere. The product, known simply as the **Short-Term Energy Model**, was developed by EIA in order to make key energy forecast information available on a timely, expanded, and interactive basis so that clients may maximize the usefulness of EIA's periodic market analysis and forecasts. It is based directly on the short-term forecasting model that EIA has developed and run for over a decade, a model which is updated every quarter from EIA's internal database operations.

The Short-Term Energy Model is a personal computer application (for Microsoft Windows, Version 3.1 and higher) that incorporates all of the information used by EIA to produce its quarterly *Short-Term Energy Outlook*, including up to two years of historical data and up to two years of forecast information for 270 energy and related economic and noneconomic variables. The model provides a user-friendly graphical interface that serves several purposes, including: 1) allowing the user to visualize, plot and print energy data and forecasts of interest; 2) servi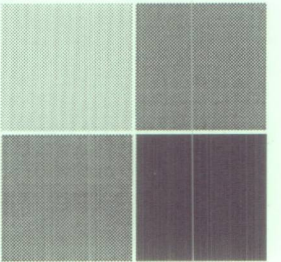ng as a platform from which the user may design and compute alternative forecast scenarios using EIA's short-term forecasting model, a compiled version of which is included in the package; 3) serving as a tool with which a rich, national-level dataset, containing the variables used in EIA's short-term forecasts, may be extracted with ease for use in various other user programs and applications. The information displayed in the Short-Term Energy model ranges from monthly, to quarterly, to annual, depending upon the desire of the user.

As a relatively compact Windows application, the Short-Term Energy Model offers point-and-click simplicity to navigating the underpinnings of EIA's short-term energy forecasts, while ensuring portability and compatibility with a wide range of desktop configurations. Menu-driven operations, with extensive context-sensitive help files included, provide a user-friendly environment for obtaining key short-term energy information.

The Short-Term Energy Model requires an IBM-compatible PC with Microsoft Windows 3.1 (or higher) installed. It is highly recommended that the PC be equipped with an 80486 processor (or better), with speed rating of 50 megahertz (or better), and with 8 megabytes (or higher) of random access memory. Less powerful machines will run the Short-Term Energy Model, but solution speed will be reduced.

To order the Short-Term Energy Model diskettes, call the Office of Scientific and Technical Information (OSTI) at (615) 576-8401, or write to OSTI, P.O. Box 62, Oak Ridge, TN 37831. Diskettes are also available from the National Technical Information Service (NTIS) at (703) 487-4650.

The Outlook

Outlook Assumptions

World Oil Prices

- Three price scenarios, based on overall market conditions, are addressed here, as significant uncertainty surrounds the world oil market. In the mid-price case, the world oil price, defined as the average cost of imported crude for U.S. refiners, is expected to gradually increase from about $16 per barrel at the end of September, to $18 by late 1995, assuming some increase in OPEC production (Figure 1). As of this writing, markets have reacted calmly to the recent crisis in Iraq.

- The low-price scenario ($13 per barrel) assumes that world demand growth is minimal due to worldwide recession, and/or oil markets are oversupplied.

- The high-price scenario (world oil price rises to $21 per barrel by late 1995) assumes that world oil demand increases, and/or supply decreases, cause stocks to be drawn down, resulting in a tight supply situation.

Economic Outlook

- In 1994, U.S. economic activity is expected to show strong growth early in the year, slowing later in 1994 and 1995 as increased demand puts pressure on prices and interest rates. Growth in real Gross Domestic Product (GDP) is expected to average 3.7 percent in 1994, and 2.1 percent in 1995. Disposable income mirrors the pattern of GDP, growing by 3.2 percent in 1994, and tapering off to 2.5 percent in 1995 (Figure 2 and Table 2).

- Much of the 1995 growth slowdown can be explained by investment reactions to rising interest rates early in 1994. Business fixed investment is forecast to increase 12 percent in 1994, but only 5 percent in 1995 because of the forecast of higher interest rates.

- Manufacturing production increases by 5.9 percent in 1994, slowing to 2.5 percent in 1995 as domestic consumption and investment growth decelerates. Total employment will increase over the forecast.

Weather Assumptions

- Heating and cooling degree-days are assumed to be normal in the forecast period (Table 9).

Figure 1. U.S. Monthly Crude Oil Prices

Sources: Fourth Quarter 1994 STIFS database and Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

Figure 2. U.S. Macroeconomic Indicators

Sources: Fourth Quarter 1994 STIFS database, U.S. Commerce Department, and Federal Reserve Board. Details provided in Figure References section, p. 42.

Outlook Assumptions

Special Assumptions for Environmental, Tax, and Other Energy-Related Policies

This section summarizes the potential impacts of current legislative actions on the short-term energy forecasts for the United States and shows how these impacts are incorporated in this *Outlook*. The impacts are anticipated to directly affect energy prices, consumption, or production.

Effective Date	Description	Impact on Forecast
Autumn 1993	FERC Order 636-A implemented.	Market-driven changes will continue. Reliance on natural gas storage levels for peak demand likely to rise, but pricing expected to be more competitive.
October 1993	Motor Fuel Tax Increase	Federal excise tax increase of 4.3 cents per gallon for motor gasoline and diesel fuel, and 48.5 cents per thousand cubic feet for compressed natural gas used in motor vehicles.
October 1994	Third season for oxygenated gasoline required to be sold in carbon monoxide nonattainment areas during winter months of each year.	Motor gasoline prices expected to be 3 to 5 cents per gallon higher in the nonattainment areas, compared to other regions, raising national prices by an average of 1 to 2 cents per gallon during winter months.[4]
January 1995	Phase I reformulated gasoline in 9 high-ozone cities (plus opt-in areas).	Approximately 6 cents per gallon higher cost in affected cities.[5]
January 1995	Phase I reduction in sulfur dioxide emissions from electric utility steam generation units fired by fossil fuels, by a system of tradeable allowances, switching or blending with lower sulfur fuels, and retrofitting with scrubbers.	Electricity prices will be slightly higher.

[1]Oil production impacts are estimates from the Energy Information Administration, Office of Oil and Gas, Reserves and Natural Gas Division.

[2]Environmental Protection Agency, *Technical Guidance: Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities*, EPA-450/391-022A, November 1991.

[3]Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

[4]Energy Information Administration, "Demand, Supply, and Price Outlook for Oxygenated Gasoline, Winter 1992-1993", *Monthly Energy Review*, DOE/EIA-0035(92/08), (Washington, DC, August 1992), pp. 5 and 9.

[5]Energy Information Administration, "Demand, Supply, and Price Outlook for Reformulated Motor Gasoline, 1995", *Monthly Energy Review*, DOE/EIA-0035(94/07), (Washington, DC, July 1994), p. 2.

International Oil Demand

- World oil demand is expected to rise by more than 900,000 barrels per day per year in both 1994 and 1995, after increasing by only 320,000 barrels per day in 1993. This development reflects upward revisions in oil demand growth in Western Europe and a smaller decline in demand in the former Soviet Union (FSU). After declining by about 1.0 million barrels per day in 1993, oil demand in the FSU and Eastern Europe is expected to decline by about 680,000 barrels per day in 1994, and by roughly 330,000 barrels per day in 1995 (Table 4). As these countries attempt to move toward Western-style economies, oil demand should decline by a smaller amount each succeeding year in the forecast.
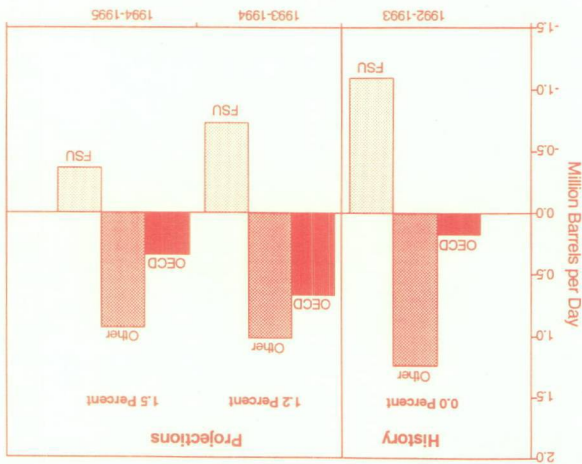
- Oil demand in countries of the Organization for Economic Cooperation and Development (OECD) is expected to increase by about 670,000 barrels per day in 1994, due largely to a 430,000 barrel per day increase in the United States. Oil demand in OECD countries is expected to grow by an additional 330,000 barrels per day in 1995 (mostly outside the United States) as economic performance in Western Europe and Japan improves (Figure 3).

- Oil demand in Asia is expected to increase by 5 to 6 percent in 1994 and 1995. In Latin America, Africa, and the Middle East, oil demand is estimated to grow by 2 to 4 percent in 1994 and 1995.[6]

- After rising by nearly 1.2 million barrels per day in 1993, oil demand in the Asia and Other region is expected to rise by about 970,000 barrels per day in 1994, and by another 890,000 barrels per day in 1995. Oil demand in these countries continues to increase substantially each year as robust economic growth continues (Figure 4).

- The expected effect of the assumed rates of economic growth in the OECD and in the developing countries, combined with a reduction in the decline rate in the economies of the FSU, is a 1.9 million barrels per day increase in world oil demand between 1993 and 1995 (Table 4).

Figure 3. World Petroleum Demand

Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

Figure 4. World Oil Demand Changes by Region

Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

International Oil Supply

Figure 5. World Oil Production
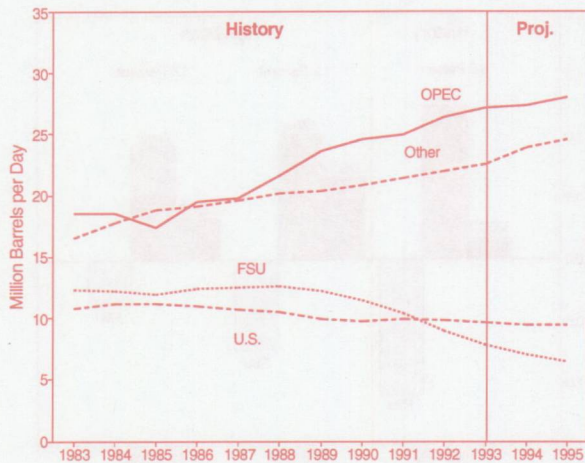
Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

Figure 6. OPEC Oil Production and Capacity

Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.
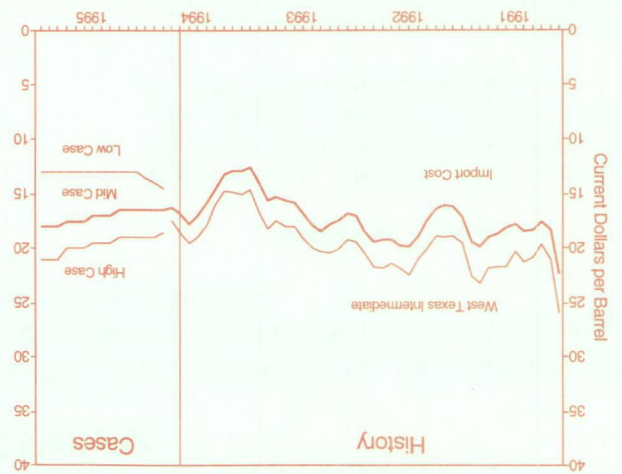
- After decreasing by an estimated 40,000 barrels per day in 1993, world petroleum production is expected to increase by 460,000 barrels per day in 1994, and by 830,000 barrels per day in 1995 (Table 4 and Figure 5).

- A large share of this increase will come from the Organization of Petroleum Exporting Countries (OPEC). OPEC production is expected to increase by almost 200,000 barrels per day in 1994, and by close to 700,000 barrels per day in 1995.

- Petroleum production in the North Sea is expected to increase by nearly 750,000 barrels per day in 1994, and by another 240,000 barrels per day in 1995. Production by non-OPEC developing countries is expected to rise by 410,000 barrels per day in 1994, and by 420,000 barrels per day in 1995.

- U.S. petroleum production is expected to continue its declining trend throughout the forecast period, falling by an average of 120,000 barrels per day between 1994 and 1995 (Table 7).

- In the FSU, petroleum production is expected to continue to fall, albeit at an attenuated rate compared to recent years. Following a 1.1 million barrel per day decline in 1993, production is expected to decline by about 830,000 barrels per day in 1994, and by a further 520,000 barrels per day in 1995

- While OPEC production is projected to increase significantly in the forecast, rising OPEC production capacity is expected to more than offset increases in production through 1994 (Figure 6).

- Average OPEC excess production capacity in 1994 and 1995 is expected to be 2.8 million barrels per day. Most of the excess capacity is from Saudi Arabia (1.7 million barrels per day), and Kuwait (300,000 barrels per day).[7] Iraq could add nearly 2 million barrels per day by end-1995 to OPEC capacity if United Nations sanctions were dropped.

World Oil Stocks and Net Trade
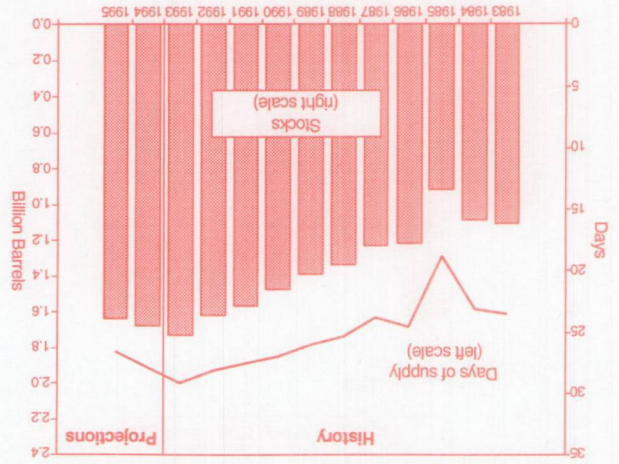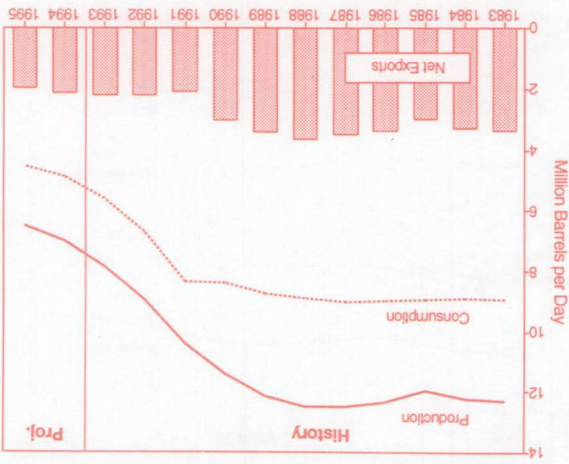
- Although petroleum stock levels in the Market Economies (which exclude the former centrally planned economies) have increased each year since 1986, this *Outlook* projects that stock levels will remain relatively stable in 1994 and 1995 (Figure 7).

- "Days of Supply" is the number of days of consumption that can be supplied by non-government stocks above the minimum operating level. Since consumption is expected to increase while stocks are expected to decline slightly, the "Days of Supply" measure declines in 1994 and 1995. However, this measure would still remain at above-average levels through the forecast.

- The United States contributed to world increases in stock levels with a 4.2 percent increase in (nonstrategic) stocks between year-end 1992 and year-end 1993.[8] With prices forecast to gradually increase over the next 2 years, there will be some incentive to draw down stocks from current levels.

- Net exports from the FSU are estimated to decline from 2.2 million barrels per day in 1993 to 2.1 million barrels per day in 1994, and 2.0 million barrels per day in 1995 (Figure 8 and Table 4). This reflects the expectation that the sharp decline in consumption that occurred after 1991, and counterbalanced production losses, will steadily moderate through the forecast.

- Although exports of petroleum are a major source of hard currency for the FSU, and thus a strong incentive in maintaining exports, expected oil production declines will make it difficult for the FSU to maintain oil exports even at the sharply reduced levels of recent years.

- An exacerbation of this situation, such as would occur if consumption in the region stabilized or began to grow again, could add significantly to production requirements in OPEC. The situation in the FSU is one of the main wildcards in the world oil market over the next 2 years.

Figure 7. Market Economies' Commercial Oil Stocks

Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

Figure 8. FSU Oil Output, Demand, and Net Exports

Sources: Energy Information Administration, Energy Markets and Contingency Information Division. Details provided in Figure References Section, p. 42.

U.S. Oil Demand

Figure 9. U.S. Petroleum Demand

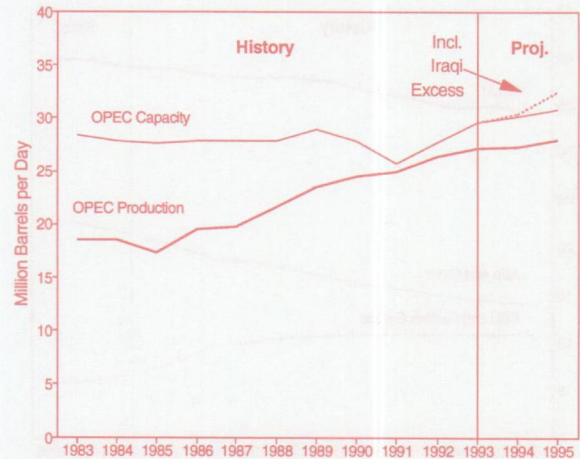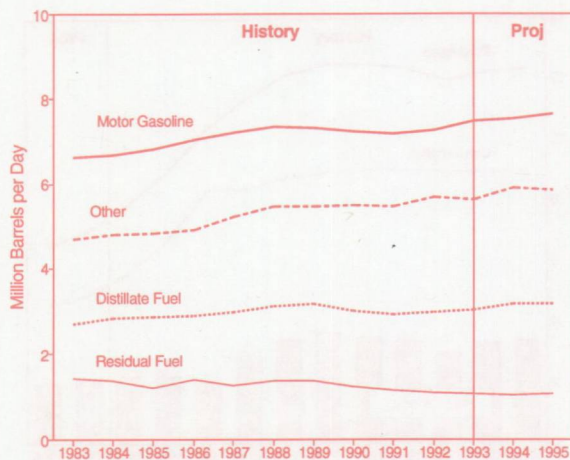Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 10. Gasoline Market Indicators

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

- U.S. oil demand is expected to show strong growth of 2.5 percent this year, but level off to 0.3 percent in 1995. Much of the year-to-date growth reported by the EIA has been the result of unusual weather factors and a particularly robust economy. With economic growth expected to slow by late 1994, and with a low probability of another severe winter, U.S. oil demand growth is expected to be slower in 1995 (Figure 9 and Table 7).

- Motor gasoline demand in 1994 is projected to increase by only 0.7 percent, due in part to the severe weather early this year (Table 3). Assumptions of normal weather in 1995 result in a 1.6-percent demand increase despite a slowing economy. Projected fuel efficiency increases averaging only 1.3 percent reflect a lack of fuel economy growth in new vehicles; a decline in the retirement rate of older, less fuel-efficient, ones; and the introduction of reformulated gasoline in 1995 (Figure 10).

- Jet fuel demand in 1994 is projected to increase by 4.1 percent. This reflects the 5- and 6-percent increases in capacity and revenue ton-

miles (Table 3) due to strong economic growth and a 6-percent decline in real ticket prices. In 1995, a slowdown in utilization and capacity growth to 1.9 and 4.0 percent, respectively, contributes to smaller, 1.3-percent, jet fuel demand growth (Table 3).

- 1994 distillate demand is projected to grow by 4.3 percent, due largely to weather effects and economic expansion. The assumption of normal weather, combined with an economic slowdown, is expected to result in a slight decline in consumption next year (see "1994-1995 Winter Fuels Outlook" above).

- Residual fuel oil demand is projected to decline by 1.8 percent in 1994 despite a weather-related demand boost. Demand is expected to rise by 1.8 percent in 1995.

- Growth in petrochemicals, as well as weather-related growth in propane, asphalt, and road-oil demand, contribute to the 4.8-percent growth in other oils in 1994. Weather patterns, assumed to be normal, account for most of the 1.8-percent decline in 1995.

U.S. Oil Supply
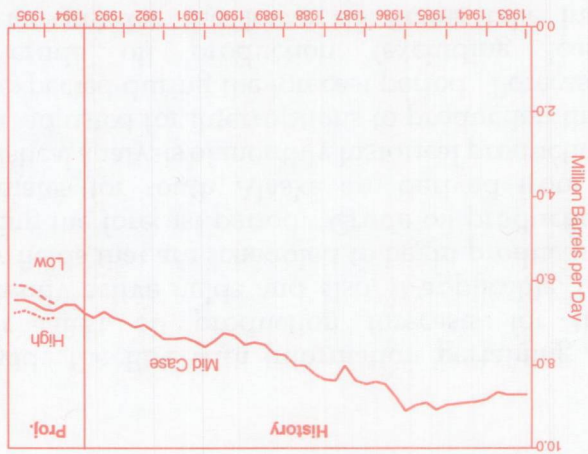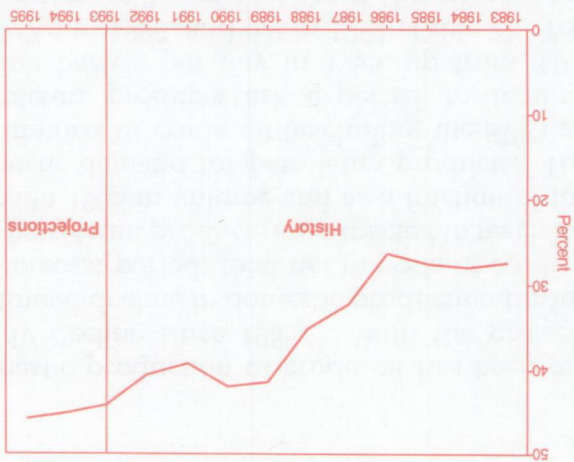
- At mid-case prices, total U.S. domestic crude oil production is expected to decline by 200,000 barrels per day (2.9 percent) in 1994, and an additional 130,000 barrels per day (2.0 percent) in 1995 (Table 7 and Figure 11).

- Oil production in the lower 48 States is expected to drop by 160,000 barrels per day in 1994, and by 80,000 barrels per day in 1995 (Table 7). Oil production from new projects in Federal offshore waters (the Santa Ynez unit in the Pacific, and the Auger project in the Gulf of Mexico) is expected to account for about 1.9 percent of total U.S. oil production by the end of 1994, if development goes as scheduled. Production from the Point Arguello Field in the Pacific Federal Offshore is expected to be maintained at 80,000 barrels per day throughout the forecast period.[9]

- Oil production in Alaska is expected to decline by 1.3 percent in 1994, and by another 3.8 percent in 1995 (Table 7). The Point McIntyre Field started producing in late 1993 and is expected to produce about 100,000 barrels per day during the forecast period. The Niakuk Field came online in the second quarter of

Field came online in the second quarter of 1994 and is expected to produce about 15,000 barrels per day during the forecast period.[10]

- Crude oil production could be as high as 6.75 million barrels per day by the fourth quarter of 1995, given the high price case (Table 8) and production from new projects in the Federal Offshore, or as low as 6.08 million barrels per day under the low price scenario (Table 6).

- Declining oil production and rising demand in the United States means an increase in net imports of crude oil and products of 500,000 barrels per day between 1993 and 1995. Total net imports will equal 45.8 percent of total petroleum demand in 1995 in the base case (Figure 12). The net import share of demand could range from 48.0 percent in the low price case to 44.1 percent in the high price case in 1995 (Tables 6 and 8).

- According to Baker Hughes, Inc., the rig count for 1993 averaged 754 and is expected to average 765 in 1994. If the economy improves in 1995 as projected, the rig count is expected to exceed 850 during that year.[11]

Sources: Fourth Quarter 1994 STIFS database and Energy Information Administration, Reserves and Natural Gas Division. Details provided in Figure References Section, p. 42.

Figure 11. U.S. Crude Oil Production

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 12. U.S. Net Oil Imports' Share of Demand

Crude Oil Production Forecasts

Domestic production of crude oil has been on a steady decline since 1985.[12] With the projected continued decline in domestic production through the forecast period, total net imports of crude oil and petroleum products are expected to reach new highs in 1995 in volume and as a fraction of total domestic demand for petroleum products. Total net imports of crude oil (excluding the SPR) and petroleum products are expected to total 8.1 million barrels per day in 1995, up from 8.0 in 1994, 7.6 in 1993, and 6.9 in 1992 (Table 7). Total net imports will represent about 46 percent of total domestic petroleum product demand in 1995, compared to 45 percent in 1994, 44 percent in 1993, and 41 percent in 1992.

Increases in product demand over the last 10 years have contributed to the higher dependence on foreign sources of petroleum. Total demand for petroleum products is expected to show an increase of about 1.5 million barrels per day between 1986 and 1995 (a total increase of about 9 percent over the 10-year period).[13] Total net imports of crude oil and petroleum products are expected to increase by 2.7 million barrels per day over the same 10-year period from 1986 to 1995. A decline in domestic crude oil production almost as large as the increase in product demand has added to the increase in dependence on foreign oil sources. Total domestic crude oil production is expected to decline by 200 thousand barrels per day in 1994, with a further decline of 130 thousand barrels per day in 1995.

Domestic crude oil production forecasts are prepared for the *Short-Term Energy Outlook* by EIA's Office of Oil and Gas, Reserves and Production Branch.[14] Quarterly crude oil production forecasts for the United States are the sum of separate estimates for Alaska and the lower 48 States. Crude oil production estimates for Alaska consist of separate estimates for the North Slope fields and the south Alaska fields. Each quarter, operators of the North Slope fields

provide the EIA with information pertaining to their latest oil production forecasts for the currently active fields and also, if applicable, for new fields that are scheduled to begin production during the forecast period. Crude oil production estimates for south Alaska are derived from a statistical analysis of monthly historical production data, adjusted for interruptions to production that are expected during the forecast period. Forecasts of crude oil production (excluding lease condensate) for the lower 48 States take into account the decline rate of old oil, the impact on production from marginal wells, and new oil added by drilling. Monthly estimates of lease condensate production are based on historical production patterns.

A decline in proved reserves of crude oil has accompanied the decline in domestic crude oil production. Proved reserves of crude oil have declined for 6 straight years since 1987 (Figure 13). Proved reserves of crude oil in 1993 were 22,957 million barrels, 3.3 percent (788 million barrels) less than in 1992.[15] This decline was more than twice the average annual decline of 1.5 percent experienced during the prior 10 years. Low oil prices and a continuing string of new lows for oil drilling are the major factors.

Five areas accounted for 80 percent of the total proved reserves of crude oil as of December 31, 1993:[16]

Area	Percent U.S. Oil Reserves
Texas	27
Alaska	25
California	16
Gulf of Mex. Fed. Offshore	9
New Mexico	3
Total	**80**

The Gulf of Mexico Federal Offshore had an oil reserve increase of 237 million barrels in 1993. Five other States/areas had minor gains or no

U.S. Oil Supply

change. The remainder had losses. Texas, Alaska, and California accounted for 82 percent of the overall U.S. decline.

Here's how the five largest oil reserve areas fared in 1993:[17]

Oil Reserves Change	
Area	(million barrels)
Texas	-270
Alaska	-247
California	-129
Gulf of Mexico Federal Offshore	+237
New Mexico	-50
United States	-788

While the number of oil wells drilled has generally been declining since 1984, the forecast is for an upturn in the rig count. According to Baker Hughes, Inc., the rig count for 1993 averaged 754. The rig count is expected to average 765 rigs in 1994 and 853 in 1995.[18] One factor that complicates the relationship between oil production and number of rigs is that drilling, if successful, can result in production of gas only, or oil with associated gas. Baker Hughes, Inc., started classifying active rigs in 1987 into those drilling for oil and those drilling for gas, including a relatively small number classified as miscellaneous. In 1988, 554 rigs were drilling for oil and 354 were drilling for gas, a ratio of 1.6 oil rigs to 1 gas rig. In the first half of 1994, the oil rigs averaged 330, and the gas rigs averaged 403, a ratio of 0.8 oil rig to 1 gas rig. Recent history indicates that both oil rig drilling efficiency and the quality of completed oil wells have increased. Rig efficiency has improved over the years and contributes towards completing more wells with fewer rigs. Rig efficiency is influenced by improved technology, the mix between oil and gas wells being drilled, as well as

the type of wells being drilled. Recent increases in horizontal wells, which take longer to drill, have had a positive impact on rig efficiency. For example, rigs per well totaled 23 in 1981 during a period of intense drilling, increased to 41 in 1986 and then dropped to 31 in 1993.

In recent years, total discoveries of crude oil per exploratory well drilled have increased according to EIA's *U.S. Crude Oil, Natural Gas and Natural Gas Liquids Reserves, 1993 Annual Report*.[19] New field discoveries of 319 million barrels of crude oil in 1993 were the highest in 23 years. This is 3 times the prior 10-year average for new field discoveries, and a tremendous turnaround from the exceptionally low 1992 level of 8 million barrels. Almost all of the new field discoveries in 1993 were in the Gulf of Mexico Federal Offshore.

Figure 13. U.S. Crude Oil Proved Reserves, 1983-1993

Sources: Details provided in Figure References Section, p. 42.

U.S. Energy Prices

Figure 14. U.S. Petroleum Prices
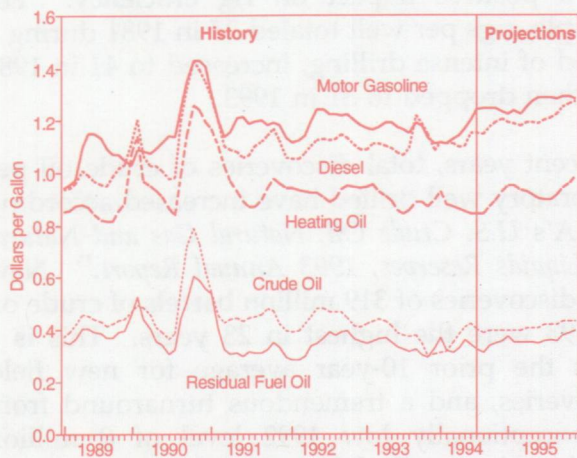
Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 15. Gross Refined Product Margins (Change from Year Ago)

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

- Crude oil prices rose in the second and third quarters of 1994, due partly to the uncertainty of Nigerian production. After the Nigerian situation stabilized in September, crude oil prices receded once again. Assuming no further disruptions, crude oil prices should stabilize at about current levels through early 1995, but then rise to about $18 per barrel by year-end (Figure 14 and Table 5).

- Most major refined petroleum products were priced above year-ago levels during the third quarter of 1994, due largely to higher crude oil prices. Heating oil prices, the exception, were slightly below third quarter 1993 levels. Projected growth in retail margins and state and local taxes should drive motor gasoline prices 1 cent higher in 1994, even as crude oil prices fall for the year.

- The average gross refiner margin for petroleum products fell in the second quarter of 1994, compared to the robust performance in the first quarter. Motor gasoline refiner margins fell by about 1 cent per gallon during this period, even though demand was relatively strong (Figure 15).

- Second quarter net income for major U.S. petroleum companies and independent refiners fell by about 10 percent from 1993 levels.[20] Average refiner margins are projected to be below 1993 levels for the remainder of 1994.

- Gradually increasing crude oil prices and continued growth in demand are expected to lift average U.S. product prices during the rest of 1994, and in 1995. Unit profitability should stabilize between 1994 and 1995 under normal weather and moderate price conditions. Reformulated gasoline supply costs should add an extra 1-2 cents per gallon to the price of motor gasoline in the U.S overall, and 4-6 cents in the mandated areas.[21] Possible tight supply situations might temporarily result in further price hikes in those affected areas.

- Motor gasoline retail prices, depressed during the first half of this year due to low oil prices, rebounded in the third quarter because of the sharp crude oil price increase and the relatively low primary inventories at mid-summer. Pump prices are expected to post a 9-cent increase in 1995.

U.S. Energy Prices

- Spot natural gas wellhead prices fell by over one dollar per thousand cubic feet from February through September 1994 and averaged nearly 80 cents below year ago levels.[22] This was largely the result of considerably higher levels of underground storage, and lower demand caused by cool summer weather. Although prices should rise during the upcoming heating season, the average annual wellhead price is expected to decline in 1994 by more than 10 cents per thousand cubic feet (Figure 16 and Table 5).

- High storage levels, better overall inventory management, continued increases in Canadian natural gas imports, and lower crude oil prices all contribute to lower projected wellhead prices in 1994 than in 1993. In 1995, the average annual wellhead price is projected to increase by a moderate 8 cents per thousand cubic feet, as crude oil prices and natural gas demand are both expected to rise.

- The expected seasonality of wellhead prices appears to be shifting, becoming flatter throughout the year and peaking in the fourth quarter, as opposed to the first quarter as in the past. This seasonal price shift is also

reflected in the current natural gas futures market.[23] The shift in seasonality and the relatively moderate projected price increases are due to several recent phenomena, some of which are the result of the Federal Energy Regulatory Commission (FERC) Order 636. Over the past few years, marketers have been controlling more of the inventories in their production areas. Coordination has grown between the pipelines and distribution companies. Storage is being utilized more efficiently in meeting demand peaks, with less reliance on production. Canadian imports have been rising annually, particularly during the winter, thus easing pressure on domestic supply sources. Finally, there has been increasing use of the natural gas futures market as a hedge against price risks. These developments reflect a more efficient market in which supply and demand fundamentals are driving price changes.[24]

- Residential natural gas prices are projected to increase by 25 cents per thousand cubic feet in 1994 (Figure 17 and Table 5). This increase may be due to the higher costs associated with industry restructuring under FERC Order 636.

Figure 16. U.S. Natural Gas Wellhead Prices

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 17. Residential Natural Gas Prices

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

U.S. Energy Prices

Figure 18. Fossil Fuel Prices to Electric Utilities

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 19. Residential Electricity Prices
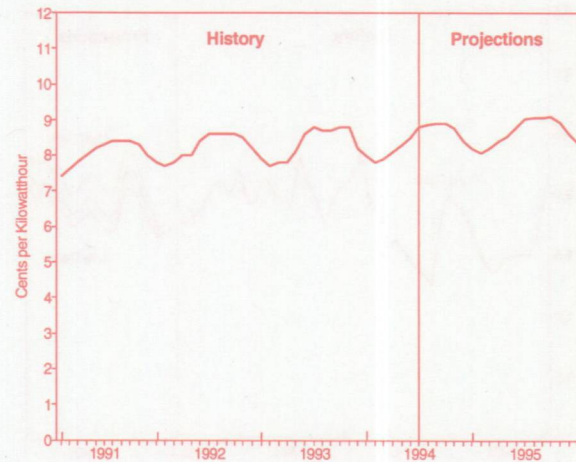
Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

- Margins (the difference between the residential price and the wellhead price) are projected to increase by 36 cents in 1994. Assuming that margins remain relatively flat in nominal terms for 1995, the residential price is expected to rise by about the amount of the wellhead price increase, 9 cents per thousand cubic feet.

- In 1991 and 1992, natural gas generally had a price advantage over residual fuel oil in the electric utility sector (Figure 18). In 1993, residual fuel prices were somewhat lower as demand fell. In 1994, the prices of the two competing fuels have converged, a trend that is expected to continue through 1995.

- The cost of coal to electric utilities has been gradually declining every year since 1984, with the exception of 1990. Dramatic productivity increases, and a shift away from underground coal towards less expensive surface-mined coal are the primary reasons. However, the cost of coal to electric utilities is expected to rise slightly in 1995.

- After increasing by only 0.1 cent per kilowatthour per year from 1991 through 1994, residential electricity prices are expected to increase by 0.3 cent in 1995, due to higher fossil fuel and capital costs and the cost of compliance with Phase I of the Clean Air Act Amendments of 1990 (Figure 19).

- A range of crude oil prices are plausible for the current *Outlook*, depending upon world supply and demand conditions. Mainly due to the uncertainty in crude oil prices, petroleum product prices are expected to move within ranges of about 5 to 10 cents per gallon above or below the mid price case

- There is similar uncertainty regarding natural gas wellhead prices (Figure 16). These prices, while influenced by movements in oil prices to some extent, depend most heavily on the strength in domestic gas markets.

U.S. Oil Demand and Supply Sensitivities
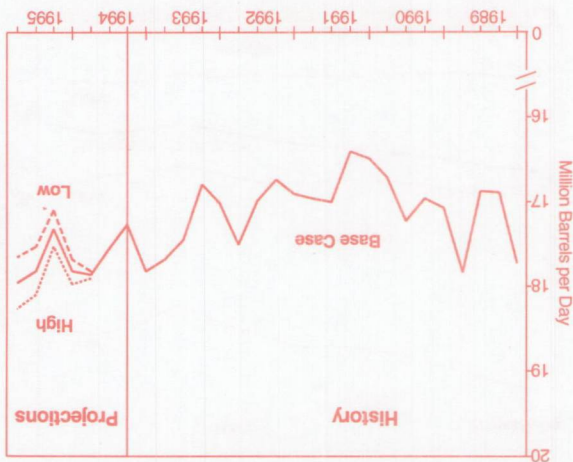
sectors.
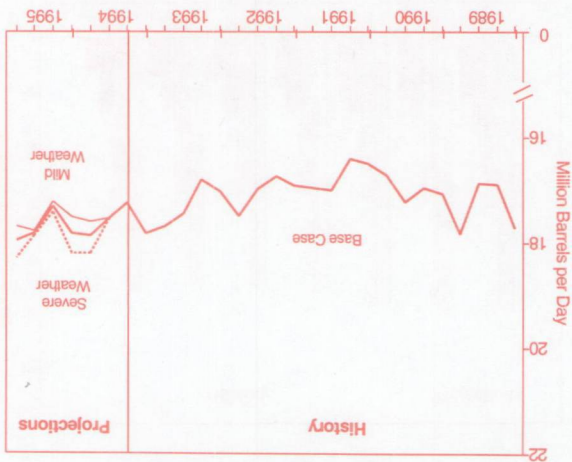
- The petroleum demand and supply outlook for the mid-price case is based on normal temperatures and a particular set of macroeconomic assumptions. To enhance the usefulness of the mid-case forecast, ranges of possible outcomes for petroleum demand and supply, using alternative macroeconomic, price, and weather assumptions, are also derived (Table 9). Plausible macroeconomic and weather-related petroleum demand cases are illustrated in Figures 20 and 21.

- The petroleum price sensitivity assumes that nonpetroleum prices remain constant. The weather sensitivities assume deviations above and below normal that correspond to one-half of the largest quarterly deviations from normal in heating and cooling degree-days over the last 15 years.

- A 1-percent increase in real GDP raises petroleum demand by about 130,000 barrels per day. Actual impacts from shifts in economic growth may vary depending upon the distribution of incremental growth across energy intensive and non-energy-intensive sectors.

- A $1-per-barrel increase in crude oil prices, assuming no price response from non-petroleum energy sources, reduces demand by about 29,000 barrels per day.

- A $1-per-barrel increase in crude oil prices boosts domestic oil supply (crude oil and natural gas liquids production) by 69,000 barrels per day.

- A 1-percent increase in heating degree-days increases demand by about 18,000 barrels per day. The impact of heating degree-day deviations from normal is not likely to be symmetrical. Extremely cold weather could result in indirect effects on fuel oil markets due to potential natural gas supply constraints that have no counterparts in the case of mild weather (Figure 21).

- A 1-percent increase in cooling degree-days increases petroleum demand by about 5,000 barrels per day.

(See Appendix A for sensitivity calculation methodology.)

Figure 20. Total Petroleum Demand: Macro Cases

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 21. Total Petroleum Demand: Weather Cases

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

U.S. Natural Gas Demand

Figure 22. Natural Gas Demand for Power Generation and Other Uses

Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 23. U.S. Natural Gas Demand Trends

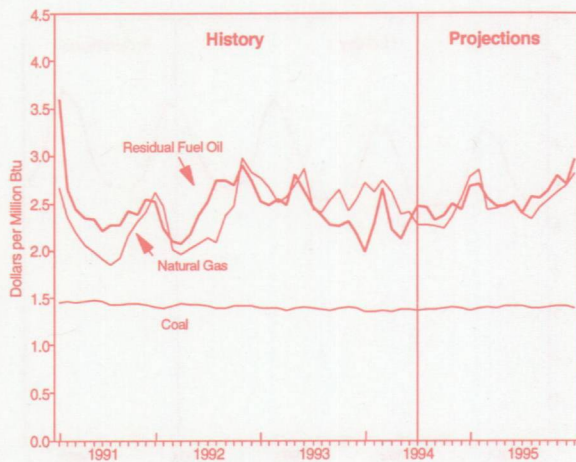Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

- U.S. natural gas demand continues to grow at a steady pace, with underlying momentum being supplied by rapid growth in gas demand for electric power generation, including that produced by nonutility generators. This category includes independent power producers and industrial facilities with cogeneration capability (Table 11 and Figure 22)

- Gas demand is expected to reach 20.98 trillion cubic feet in 1994, an increase of 3.4 percent compared with 1993, due in part to the severe weather in January and February. In 1995, despite the likelihood that weather conditions will not surpass the 1994 winter in severity, and the expected slowing of economic growth, gas demand is projected to grow by an additional 2.2 percent, to 21.45 trillion cubic feet (Figure 23).

- Of the nearly 1.2 trillion cubic feet in additional gas demand expected for the 1993 to 1995 period, over 660 billion cubic feet is expected to be the result of increased electric power generation, with more than half of that category accounted for by increased electricity output by nonutility generators, mainly industrial cogenerators. With this projection, nonutility generators are expected to account for 1.2 trillion cubic feet, or about 45 percent, of the increase in domestic natural gas demand between 1989 and 1995.

- Industrial demand (excluding nonutility electricity generation) for natural gas is forecast to increase by 1.7 percent in 1994, and by 2.2 percent in 1995. This category is newly defined for this *Outlook*, replacing the previous definition, which included gas use for nonutility electricity output.

- Residential sector demand in 1994 is expected to be up by 1.8 percent, primarily reflecting the continued addition of new natural gas customers, but also the severe winter weather experienced in the first quarter of 1994. Under the assumption of normal weather in 1995, residential demand is projected to increase by 1.4 percent over 1994 levels.

U.S. Natural Gas Supply
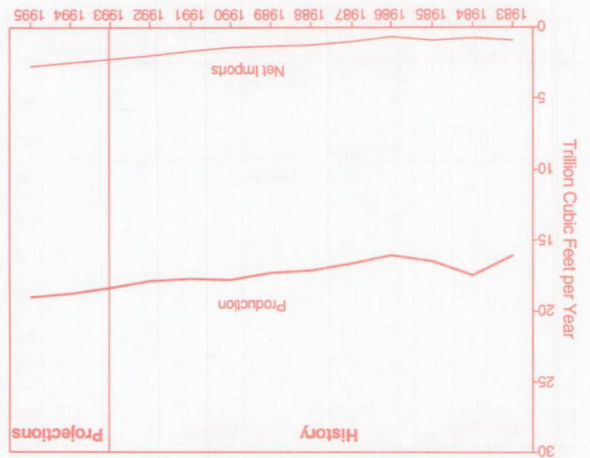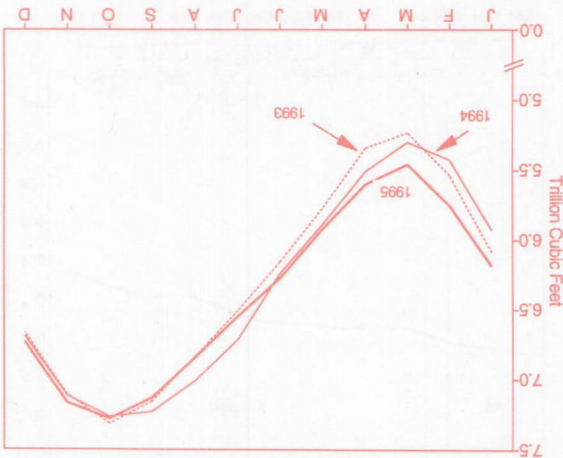
- U.S. dry gas production continues to rise steadily, although not as fast as demand. In 1994, dry gas production is forecast to increase by 2.5 percent over the previous year. Total dry gas production in 1994 is projected at 18.8 trillion cubic feet, and in 1995, at 19.0 trillion cubic feet (Figure 24 and Table 11).

- Natural gas storage levels rose quickly in May and June after ending the heating season at below average levels. Working gas storage was estimated at 50 percent full in mid-June, and the early rise in storage levels has been a major influence in the natural gas market this summer. Lower spot market prices relative to year ago encouraged the strong start to the injection season (Figure 25), and the high level of storage injection in the face of otherwise lower demand, in turn, influenced the continued slide in wellhead prices.

- Gas in underground storage is expected to total 7.23 trillion cubic feet by end of September, 1994, somewhat higher than a year ago. Less reliance on production in meeting demand peaks is the result of more efficient utilization of storage.

- The U.S. natural gas system can currently deliver 25 trillion cubic feet per year and approximately 124 billion cubic feet on a peak day. By 1995, the National Petroleum Council estimates that total U.S. deliverability will increase to nearly 26 trillion cubic feet per year and about 126 billion cubic feet on a peak day. High deliverability storage facilities is a key factor in balancing the relatively constant supply from production areas and the wide seasonal variation in demand.[26]

- Net natural gas imports growth is forecast to continue to expand, by 11.3 percent in 1994, and 9.8 percent in 1995. The high growth of imports in 1994 is due partly to the January cold snap, and also to the relatively high level of imports in July through September, much of which went into storage. A slowing of the rate of imports growth in 1995 is probable as Canada approaches its export ceiling of 3 trillion cubic feet per year, as estimated in a study for the Canadian National Energy Board.[25]

Figure 24. U.S. Dry Gas Production and Net Imports

Sources: Fourth Quarter 1994 STIFS database and Energy Information Administration, Reserves and Natural Gas Division. Details provided in Figure References Section, p. 42.

Figure 25. Total Gas in Underground Storage

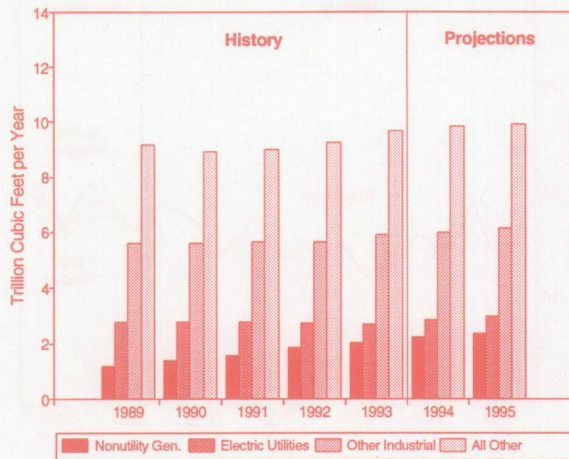Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

U.S. Coal Demand and Supply

Figure 26. U.S. Coal Demand Trends
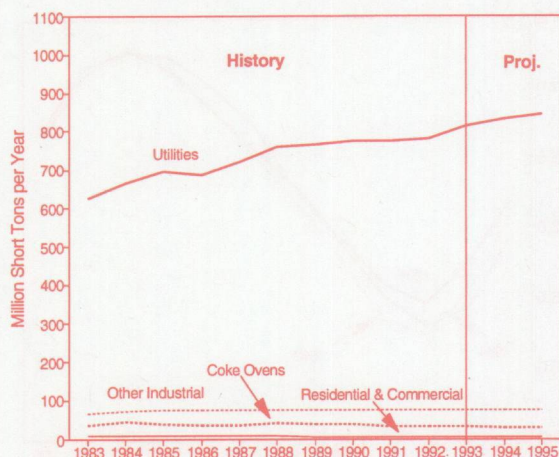
Figure 27. Components of U.S. Coal Supply
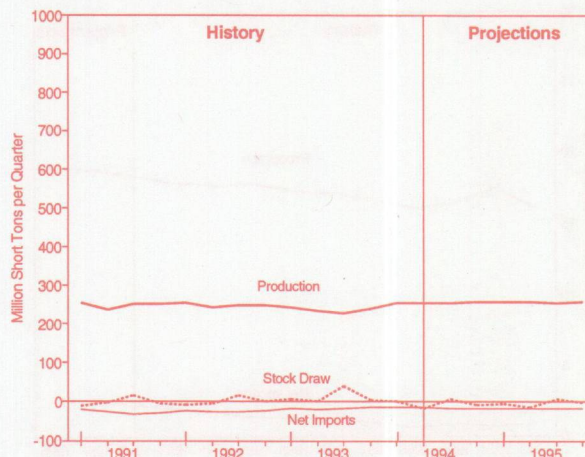
- Total coal consumption will increase by 2.2 percent in 1994 (Table 12). Growth in electricity demand will be the main impetus to growth in coal demand, but consumption in other coal consuming sectors also increases (Figure 26). Coal consumption in 1995 is expected to grow by 0.9 percent.

- Utility coal demand is expected to increase by 2.5 percent in 1994. Growing demand for electricity, combined with declines in electricity generation from petroleum and nuclear power, leads to a 1.1-percent increase in utility coal demand for 1995 (Table 12). Coal-fired electricity generation accounts for approximately 57 percent of electricity produced by utilities.

- Demand for coal at coke plants is expected to decline in 1994 despite increased raw steel production. In 1995 demand for coal at coke plants will grow by 1.3 percent. Imports of coal coke, production of steel by electric arc furnaces, and capacity limitations at domestic coking plants are expected to constrain future domestic coal demand growth in steel production.

- Coal demand by the retail and general industry sectors grows by 1.6 percent in 1994. Severe weather in the first quarter led to sharp increases in the consumption of coal by the industrial, residential and commercial sectors. Consumption in 1995 is expected to decrease by 1.7 percent. Demand from these sectors shrinks as normal weather is assumed, and coal begins to be displaced to meet environmental regulations and conservation initiatives.

- U.S. coal exports are not expected to experience growth until 1995. Exports continue declining and decrease by 12.8 percent in 1994. In 1995, export growth recovers along with the global economy, increasing by 14.5 percent (Table 12).

- Coal production is expected to grow by 8.1 percent in 1994, as stocks are replenished, and coal consumption increases (Figure 27). Production grows modestly in 1995, increasing by 9 million short tons, or 0.9 percent.

U.S. Electricity Demand and Supply

Figure 28. Electricity Demand Changes by Sector
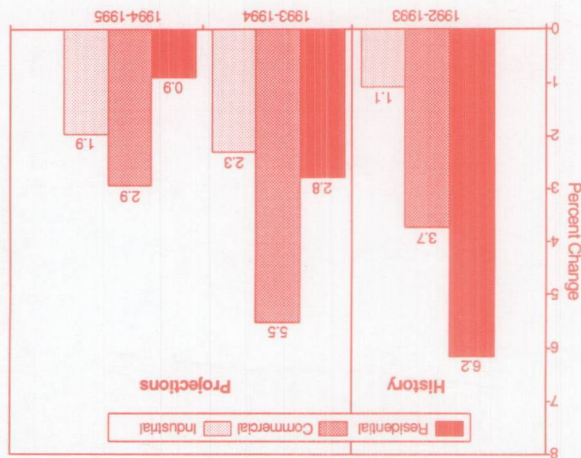
Sources: Fourth Quarter 1994 STIFS database. Details provided in Figure References Section, p. 42.

Figure 29. U.S. Electricity Supply Trends
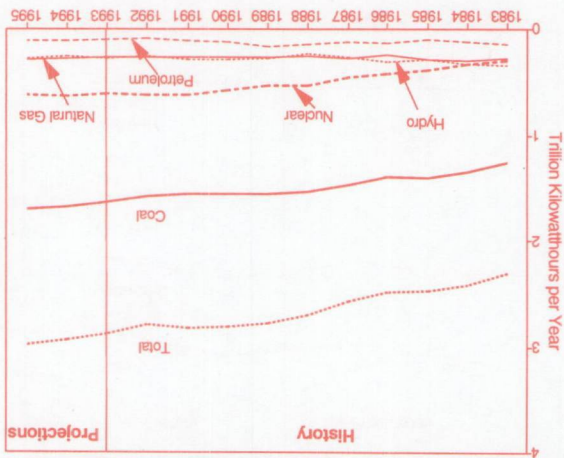
Sources: Fourth Quarter 1994 STIFS database and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. Details provided in Figure References Section, p. 42.

- Electricity demand growth is expected to continue to rise in 1994 at a rate of 3.3 percent, close to the 1993 rate. In 1995, the slowing economy and assumed normal weather results in somewhat lower growth in electricity demand than in 1994.

- Growth in residential demand for electricity in 1994 is projected at 2.8 percent. Growth in commercial sector demand is projected at 5.5 percent in 1994, and 2.9 percent in 1995, due primarily to expanding employment (Figure 28 and Table 13).

- Industrial demand growth in 1994 is projected at 2.3 percent, and in 1995 it is projected to rise by 1.9 percent, reflecting the increases in manufacturing production (Table 13).

- Oil and natural gas generation are expected to experience the greatest expansion in 1994, while hydropower decreases. Lower prices for oil and gas prompt rising utility use of these fuels, and below normal water conditions in the West, particularly in the Northwest, restrict hydropower (Figure 29).

- Net imports of electricity from Canada are expected to be high in 1994. This is due mainly to increased interruptible purchases from Ontario Hydro and Hydro Quebec, which have been pursuing markets for their surplus electricity. They have good water conditions and offer competitive prices compared to other available electricity in the surrounding areas. Imports are not expected to be as high in 1995, as the surplus electricity may be needed to meet internal Canadian demand.

- Coal generation in 1994 and 1995 will not be growing as rapidly as in 1993 due to compliance with the Clean Air Act. In 1994 nuclear generation is expected to grow by 2.5 percent because of projected increases in capacity and efficiency. In 1995, no further increases in nuclear capacity are expected.

- U.S. utilities are expected to generate about 2.1 and 1.2 percent more electricity in 1994 and 1995, respectively. Nonutility generation is expected to increase at even faster rates of 9.0 percent in 1994, and 6.6 percent in 1995, as a result of capacity additions.

U.S. Renewable Energy Demand

Figure 30. Renewable Energy Use for Electricity
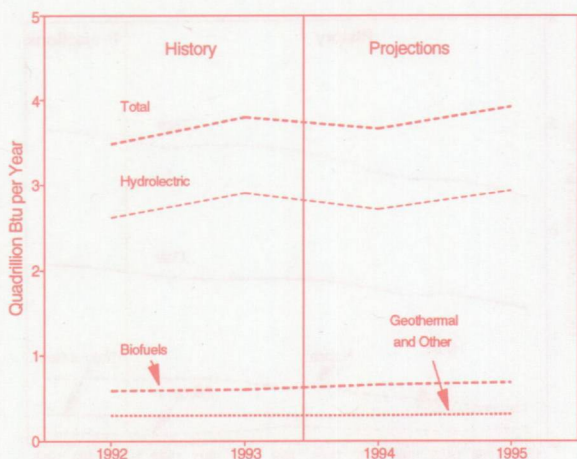
Figure 31. Renewable Energy Use by Sector
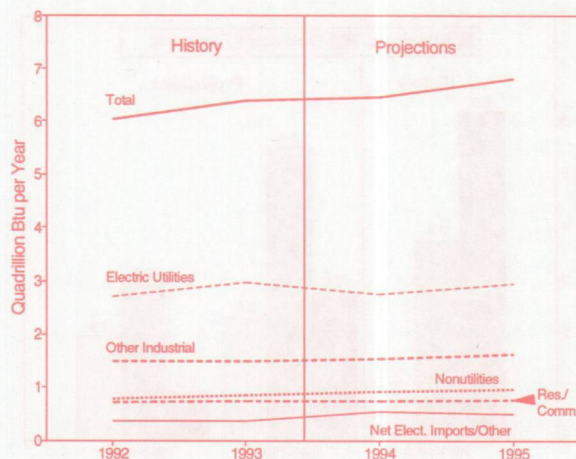
- Renewable energy use in the United States amounted to approximately 6.04 quadrillion Btu (quads), or about 7.1 percent of total domestic gross energy demand in 1992 (Figure 30 and Tables 1 and 14). Since then renewables have grown steadily, the main impetus for growth coming from the electricity producing sector of the economy. By 1995, renewable energy sources are expected to account for 7.5 percent of the domestic energy demand total.

- More than half of all renewable energy use measured by EIA is associated with the production of electricity. While the biggest component of electricity producers' use of renewables is hydroelectric power generated by regulated electric utilities, a significant and growing share of renewables use is observed at nonutility generating facilities.

- Most of the industrial use of renewables involves biofuels, principally wood and wood by-products. However, all of the major forms of renewables use at nonutilities (including hydropower) seem to be steadily growing.

- On balance, it is expected that of a 0.44 quad increase over the three year period of 1992 through 1995 in total renewables use in the power generation sector, about 40 percent will have come from expansion of nonutility power.

- Currently, aside from power generation, the most significant area of renewables use is in the industrial sector (23.8 percent in 1994)(Figure 31), and again this component relates principally to biofuels for process heat.

- Renewables use in the combined residential and commercial sector, at about 0.73 quad this year, accounts for about 11.3 percent of total domestic renewables demand. Most of this energy relates to estimates of wood used for home heating, with only a very small amount having to do with solar heating.

- A fairly significant and growing portion of total renewables demand is net electricity imports. This category is counted as renewable energy because it stems largely from hydropower output in Canada.[27]

Table 2. U.S. Macroeconomic and Weather Assumptions

	Macro Case	1993 1st	1993 2nd	1993 3rd	1993 4th	1994 1st	1994 2nd	1994 3rd	1994 4th	1995 1st	1995 2nd	1995 3rd	1995 4th	Year 1993	Year 1994	Year 1995
Macroeconomic [a]																
Real Gross Domestic Product	High								5393	5456	5506	5553	5592		5327	5527
(billion 1987 dollars)	Mid	5075	5105	5139	5218	5261	5310	5341	5377	5402	5419	5440	5477	5135	5323	5435
	Low								5361	5348	5332	5328	5362		5319	5342
	High								3.4	3.7	3.7	4.0	3.7		3.7	3.8
Percentage Change from Prior Year ...	Mid	3.2	3.2	3.0	3.1	3.7	4.0	3.9	3.0	2.7	2.0	1.9	1.9	3.1	3.7	2.1
	Low								2.7	1.7	0.4	-0.2	0.0		3.6	0.4
Annualized Percent Change	High								3.9	4.7	3.6	3.4	2.8			
from Prior Quarter	Mid	1.2	2.4	2.6	6.1	3.3	3.7	2.3	2.7	1.9	1.3	1.6	2.7			
	Low								1.5	-1.0	-1.2	-0.3	2.5			
GDP Implicit Price Deflator	High								1.270	1.277	1.282	1.286	1.293		1.261	1.285
(Index, 1987=1.000)	Mid	1.229	1.234	1.237	1.241	1.250	1.259	1.265	1.271	1.281	1.289	1.295	1.302	1.235	1.261	1.292
	Low								1.272	1.285	1.295	1.304	1.311		1.261	1.299
	High								2.4	2.2	1.9	1.7	1.8		2.1	1.9
Percentage Change from Prior Year ...	Mid	2.5	2.2	2.1	1.8	1.7	2.0	2.2	2.5	2.5	2.4	2.4	2.4	2.2	2.1	2.4
	Low								2.6	2.8	2.9	3.1	3.0		2.1	3.0
Real Disposable Personal Income	High								3880	3930	3972	4010	4036		3826	3987
(billion 1987 Dollars)	Mid	3659	3701	3708	3748	3779	3807	3837	3867	3889	3906	3924	3949	3704	3823	3917
	Low								3855	3848	3840	3839	3862		3820	3847
	High								3.5	4.0	4.3	4.5	4.0		3.3	4.2
Percentage Change from Prior Year ...	Mid	1.5	2.2	2.0	0.5	3.3	2.9	3.5	3.2	2.9	2.6	2.3	2.1	1.5	3.2	2.5
	Low								2.9	1.8	0.9	0.0	0.2		3.1	0.7
Manufacturing Production	High								1.214	1.237	1.257	1.272	1.279		1.187	1.261
(Index, 1987=1.000)	Mid	1.103	1.112	1.118	1.141	1.163	1.180	1.191	1.206	1.210	1.213	1.216	1.221	1.119	1.185	1.215
	Low								1.198	1.182	1.169	1.159	1.163		1.183	1.168
	High								6.4	6.4	6.5	6.8	5.4		6.1	6.2
Percentage Change from Prior Year ...	Mid	4.8	4.1	4.5	5.0	5.5	6.1	6.5	5.7	4.0	2.8	2.1	1.2	4.6	5.9	2.5
	Low								5.0	1.7	-0.9	-2.6	-2.9		5.8	-1.2
OECD Economic Growth (percent) [b] ...														1.4	2.6	2.4
Weather [c]																
Heating Degree-Days																
U.S.		2351	534	109	1706	2438	486	104	1636	2327	524	89	1636	4700	4664	4576
New England		3413	845	148	2322	3631	858	211	2269	3267	915	171	2269	6728	6969	6621
Middle Atlantic		3049	677	105	2117	3357	631	127	2026	2993	716	105	2026	5948	6141	5839
U.S. Gas-Weighted		2367	539	115	1733	2496	520	107	1686	2426	539	81	1686	4754	4809	4732
Cooling Degree-Days (U.S.)		29	317	810	62	34	391	755	72	30	334	758	72	1218	1252	1193

[a] Macroeconomic projections from DRI/McGraw-Hill model forecasts are seasonally adjusted at annual rates and modified as appropriate to the mid world oil price case. These mid-case macroeconomic projections are then modified by the low and high world oil price cases (as shown in Table 5) and by various explicit economic assumptions, with the low world oil price case applied to the high macroeconomic case, and the high world oil price case applied to the low macroeconomic case.

[b] OECD: Organization for Economic Cooperation and Development.

[c] Population-weighted degree days. A degree day indicates the temperature variation from 65 degrees Fahrenheit (calculated as the simple average of the daily minimum and maximum temperatures) weighted by 1980 population. Normal is used for the forecast period and is defined as the average number of degree days between 1951 and 1980 for a given period.

Note: Historical data are printed in bold, forecasts are in italic.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/08); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, August 1994; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Monthly State, Regional, and National Heating/Cooling Degree Days Weighted by Population*; Federal Reserve System, *Statistical Release G.17(419)*, August 1994. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0994.

Table 3. U.S. Energy Indicators: Mid World Oil Price Case

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Macroeconomic [a]															
Real Fixed Investment (billion 1987 dollars)	771	787	809	852	873	892	911	925	936	945	953	963	805	900	949
Real Exchange Rate (index)	1.292	1.254	1.273	1.290	1.288	1.260	1.222	1.235	1.252	1.272	1.273	1.273	1.277	1.251	1.267
Business Inventory Change (billion 1987 dollars)	-1.8	3.9	2.5	-7.7	9.9	3.3	6.5	7.8	11.2	3.9	0.6	-2.0	-0.8	6.9	3.4
Wholesale Price Index (index, 1980-1984=1.000)	1.186	1.195	1.187	1.189	1.197	1.199	1.202	1.210	1.226	1.233	1.237	1.242	1.189	1.202	1.235
Consumer Price Index (index, 1980-1984=1.000)	1.431	1.442	1.449	1.460	1.467	1.477	1.490	1.501	1.513	1.525	1.536	1.547	1.446	1.484	1.530
Petroleum Product Price Index (index, 1980-1984=1.000)	0.627	0.654	0.611	0.588	0.551	0.565	0.576	0.585	0.643	0.638	0.630	0.628	0.620	0.569	0.635
Non-Farm Employment (millions)	109.72	110.25	110.75	111.36	111.98	112.99	113.80	114.41	114.98	115.48	115.93	116.40	110.52	113.29	115.70
Commercial Employment (millions)	72.25	72.82	73.35	73.92	74.47	75.36	76.11	76.67	77.19	77.64	78.08	78.56	73.09	75.65	77.87
Total Industrial Production (index, 1987=1.000)	1.097	1.103	1.111	1.129	1.152	1.164	1.174	1.186	1.189	1.192	1.194	1.199	1.110	1.169	1.194
Housing Stock (millions)	106.19	106.48	106.78	107.10	107.44	107.80	108.10	108.50	108.80	109.13	109.50	109.80	106.64	107.96	109.31
Miscellaneous															
Gas Weighted Industrial Production (index, 1987=1.000)	1.093	1.103	1.109	1.124	1.127	1.153	1.159	1.164	1.161	1.157	1.153	1.157	1.107	1.151	1.157
Vehicle Miles Traveled (million miles per day)	5707	6487	6705	6163	5799	6697	6844	6296	6039	6838	7010	6445	6268	6411	6585
Vehicle Fuel Efficiency (miles per gallon)	19.29	20.39	20.59	19.50	19.21	20.76	21.17	19.85	19.43	21.36	21.15	19.98	19.96	20.27	20.50
Real Vehicle Fuel Cost (cents per mile)	4.24	4.04	3.90	4.11	3.94	3.74	3.96	4.17	4.18	3.90	3.96	4.16	4.06	3.95	4.04
Air Travel Capacity (available ton-miles)	335.4	342.1	359.1	346.9	340.2	360.4	384.4	371.2	365.4	376.0	395.1	378.6	345.9	364.2	378.8
Aircraft Utilization (revenue ton-miles)	175.2	190.2	205.0	191.6	185.9	204.7	222.3	198.9	191.2	208.1	225.8	201.9	190.6	203.0	206.8
Aircraft Yield (cents per ton-mile)	14.47	13.64	12.92	13.53	13.90	13.33	12.33	13.16	13.47	12.43	11.48	12.39	13.61	13.14	12.39
Residential Natural Gas Customers (millions)	52.35	51.71	51.34	51.73	52.47	52.17	51.84	52.33	53.07	52.90	52.74	53.24	51.78	52.20	52.99
Commercial Natural Gas Customers (millions)	4.50	4.40	4.32	4.40	4.52	4.47	4.40	4.50	4.63	4.57	4.50	4.60	4.40	4.47	4.57
Raw Steel Production (millions)	23.62	24.14	23.94	24.20	23.92	24.56	23.98	24.62	23.95	24.61	24.37	24.77	95.91	97.09	97.70

[a] Macroeconomic projections from DRI/McGraw-Hill model forecasts are seasonally adjusted at annual rates and modified as appropriate to the mid world oil price case. These mid-case macroeconomic projections are then modified by the low and high world price cases (as shown in Table 5) and by various explicit economic assumptions, with low world oil price case applied to the high macroeconomic case, and high world oil price case applied to the low macroeconomic case.

Note: Historical data are printed in bold, forecasts are in italic.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, August 1994; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Monthly State, Regional, and National Heating/Cooling Degree Days Weighted by Population*; Federal Reserve System, *Statistical Release G.17(419)*, August 1994. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0994.

Table 4. International Petroleum Supply and Demand: Mid World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Demand [a]															
OECD															
U.S. (50 States)	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.86	17.83	17.32	17.81	17.96	17.24	17.67	17.73
U.S. Territories	0.22	0.24	0.22	0.27	0.24	0.28	0.24	0.24	0.24	0.29	0.24	0.24	0.24	0.25	0.25
Canada	1.64	1.61	1.71	1.69	1.69	1.64	1.73	1.72	1.71	1.66	1.76	1.75	1.66	1.70	1.72
Europe [b]	13.62	12.95	13.57	14.28	13.71	13.27	13.67	13.92	13.88	13.43	13.83	14.09	13.61	13.64	13.81
Japan	6.14	5.04	4.79	5.56	6.20	5.07	5.10	5.70	6.26	5.12	5.18	5.79	5.38	5.52	5.58
Australia and New Zealand	0.87	0.89	0.87	0.91	0.89	0.91	0.90	0.90	0.89	0.92	0.91	0.91	0.88	0.90	0.91
Total OECD	39.50	37.52	38.60	40.40	40.55	38.62	39.19	40.34	40.81	38.74	39.74	40.73	39.01	39.67	40.01
Non-OECD															
Former Soviet Union	6.33	5.60	5.15	5.35	5.32	4.70	4.58	4.87	4.84	4.33	4.26	4.58	5.60	4.87	4.50
China	2.78	2.90	3.00	3.10	3.12	3.15	3.19	3.26	3.29	3.32	3.36	3.39	2.95	3.18	3.34
Europe	1.27	1.17	1.12	1.17	1.29	1.21	1.18	1.26	1.33	1.25	1.22	1.30	1.18	1.24	1.27
Other Non-OECD	18.32	18.18	18.04	19.05	19.03	18.86	18.77	19.86	19.76	19.58	19.48	20.63	18.40	19.13	19.86
Total Non-OECD	28.69	27.85	27.31	28.67	28.75	27.93	27.73	29.25	29.22	28.49	28.32	29.89	28.13	28.41	28.98
Total World Demand	68.19	65.37	65.91	69.06	69.30	66.55	66.92	69.59	70.03	67.23	68.06	70.62	67.13	68.09	68.98
Supply [c]															
OECD															
U.S. (50 States)	9.84	9.55	9.46	9.56	9.35	9.30	9.36	9.49	9.48	9.37	9.29	9.31	9.60	9.38	9.36
Canada	2.09	2.16	2.30	2.27	2.31	2.32	2.35	2.33	2.33	2.31	2.33	2.34	2.21	2.33	2.33
North Sea [d]	4.35	4.28	4.58	5.09	5.20	5.27	5.25	5.57	5.57	5.37	5.53	5.78	4.58	5.32	5.56
Other OECD	1.42	1.42	1.42	1.36	1.41	1.45	1.48	1.49	1.49	1.47	1.48	1.49	1.40	1.46	1.48
Total OECD	17.69	17.42	17.76	18.29	18.27	18.34	18.43	18.88	18.86	18.52	18.63	18.91	17.79	18.48	18.73
Non-OECD															
OPEC	27.42	26.66	27.30	27.18	27.33	27.31	27.18	27.50	27.71	27.81	28.01	28.51	27.14	27.33	28.01
Former Soviet Union	8.28	8.04	7.55	7.43	7.19	7.01	6.94	6.83	6.61	6.45	6.46	6.36	7.82	6.99	6.47
China	2.88	2.93	2.89	2.94	2.91	2.94	2.96	2.99	2.94	2.95	2.96	2.97	2.91	2.95	2.96
Mexico	3.10	3.15	3.15	3.22	3.20	3.18	3.23	3.25	3.25	3.27	3.29	3.31	3.16	3.21	3.28
Other Non-OECD	8.20	8.18	8.28	8.43	8.48	8.56	8.58	8.71	8.84	8.90	8.95	9.06	8.27	8.58	8.94
Total Non-OECD	49.88	48.97	49.17	49.20	49.11	49.00	48.89	49.28	49.35	49.37	49.66	50.20	49.30	49.07	49.65
Total World Supply	67.57	66.38	66.93	67.48	67.39	67.34	67.33	68.16	68.21	67.89	68.29	69.12	67.09	67.55	68.38
Stock Changes and Statistical Discrepancy															
Net Stock Withdrawals or Additions (-)															
U.S. (50 States including SPR)	0.02	-0.84	0.01	0.20	0.77	-0.43	-0.59	0.21	0.57	-0.58	-0.27	0.18	-0.15	-0.01	-0.03
Other	0.22	0.05	-1.73	0.51	0.90	-0.76	-0.35	0.66	0.75	-0.60	-0.48	0.82	-0.24	0.11	0.12
Total Stock Withdrawals	0.24	-0.79	-1.72	0.71	1.67	-1.18	-0.94	0.88	1.32	-1.18	-0.75	1.00	-0.39	0.10	0.09
Statistical Discrepancy	0.39	-0.22	0.70	0.87	0.24	0.39	0.53	0.56	0.50	0.51	0.52	0.51	0.44	0.43	0.51
Closing Stocks (billion barrels) [e]	5.56	5.63	5.79	5.72	5.57	5.68	5.76	5.68	5.57	5.67	5.74	5.65	5.72	5.68	5.65
Non-OPEC Supply	40.14	39.72	39.63	40.31	40.05	40.02	40.15	40.66	40.51	40.08	40.28	40.61	39.95	40.22	40.37
Net Exports from Former Soviet Union	1.95	2.44	2.40	2.08	1.87	2.30	2.36	1.97	1.78	2.12	2.19	1.78	2.22	2.13	1.97

[a] Demand for petroleum by the OECD countries is synonymous with "petroleum product supplied" which is defined in the glossary of the EIA *Petroleum Supply Monthly*, DOE/EIA-0109. Demand for petroleum by the non-OECD countries is "apparent consumption" which includes internal consumption, refinery fuel and loss, and bunkering.

[b] OECD Europe includes eastern Germany.

[c] Includes production of crude oil (including lease condensates), natural gas plant liquids, other hydrogen and hydrocarbons for refinery feedstocks, refinery gains, alcohol, and liquids produced from coal and other sources.

[d] Includes offshore supply from Denmark, Germany, the Netherlands, Norway, and the United Kingdom.

[e] Excludes stocks held in the Former CPEs.

OECD: Organization for Economic Cooperation and Development
OPEC: Organization of Petroleum Exporting Countries
SPR: Strategic Petroleum Reserve
Former CPEs: Albania, Bulgaria, Cambodia, China, Cuba, the Czech and Slovak Federal Republic, Hungary, Laos, Mongolia, North Korea, Poland, Romania, the Former Soviet Union, Vietnam, and Former Yugoslavia

Notes: Minor discrepancies with other published EIA historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Energy Information Administration, *International Petroleum Statistics Report*, DOE/EIA-0520(94/09); and *International Energy Annual 1992*, DOE/EIA-0219(92); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through September 1994.

Table 5. U.S. Energy Prices
(Nominal Dollars)

	Price Case	1993 1st	1993 2nd	1993 3rd	1993 4th	1994 1st	1994 2nd	1994 3rd	1994 4th	1995 1st	1995 2nd	1995 3rd	1995 4th	Year 1993	Year 1994	Year 1995
Imported Crude Oil [a]	Low								14.01	13.00	13.00	13.00	13.00		15.05	13.00
(dollars per barrel)	Mid	17.34	17.67	15.60	14.09	13.01	15.81	16.94	16.50	16.50	17.00	17.50	18.00	16.13	15.68	17.27
	High								18.83	19.00	19.50	20.00	21.00		16.24	19.90
Natural Gas Wellhead	Low								1.89	1.82	1.82	1.83	2.01		1.87	1.87
(dollars per thousand cubic feet)	Mid	1.89	2.09	2.03	2.03	2.06	1.83	1.72	2.01	1.96	1.93	1.92	2.12	2.01	1.90	1.98
	High								2.13	2.15	2.12	2.08	2.29		1.93	2.16
Petroleum Products																
Gasoline Retail [b]	Low								1.20	1.15	1.18	1.18	1.17		1.17	1.17
(dollars per gallon)	Mid	1.17	1.19	1.16	1.17	1.11	1.15	1.23	1.24	1.23	1.27	1.28	1.29	1.17	1.18	1.27
	High								1.29	1.29	1.33	1.34	1.36		1.19	1.33
No. 2 Diesel Oil, Retail	Low								1.13	1.11	1.10	1.11	1.15		1.12	1.11
(dollars per gallon)	Mid	1.10	1.10	1.08	1.19	1.10	1.10	1.15	1.19	1.19	1.19	1.21	1.26	1.12	1.14	1.21
	High								1.24	1.24	1.25	1.27	1.33		1.15	1.27
No. 2 Heating Oil, Wholesale	Low								0.48	0.45	0.44	0.45	0.47		0.50	0.45
(dollars per gallon)	Mid	0.57	0.56	0.52	0.51	0.53	0.51	0.51	0.54	0.54	0.54	0.56	0.60	0.54	0.52	0.56
	High								0.60	0.60	0.60	0.62	0.67		0.54	0.62
No. 2 Heating Oil, Retail	Low								0.85	0.86	0.82	0.80	0.85		0.88	0.85
(dollars per gallon)	Mid	0.95	0.91	0.85	0.88	0.90	0.86	0.84	0.90	0.94	0.92	0.90	0.97	0.91	0.89	0.94
	High								0.96	1.00	0.98	0.96	1.04		0.90	1.01
No. 6 Residual Fuel Oil, Retail [c]	Low								12.61	12.47	11.71	11.70	12.48		13.54	12.12
(dollars per barrel)	Mid	14.73	15.13	13.53	12.71	14.20	13.84	13.56	14.49	15.06	14.63	14.95	16.14	13.97	14.07	15.22
	High								16.23	16.91	16.47	16.78	18.36		14.55	17.17
Electric Utility Fuels																
Coal	Low								1.37	1.37	1.38	1.36	1.36		1.37	1.37
(dollars per million Btu)	Mid	1.38	1.39	1.38	1.38	1.36	1.38	1.38	1.39	1.39	1.42	1.40	1.40	1.38	1.38	1.40
	High								1.41	1.42	1.46	1.45	1.46		1.39	1.45
Heavy Fuel Oil [d]	Low								2.26	2.17	2.01	2.07	2.24		2.34	2.12
(dollars per million Btu)	Mid	2.50	2.60	2.30	2.14	2.38	2.32	2.37	2.56	2.59	2.46	2.58	2.83	2.36	2.41	2.61
	High								2.84	2.88	2.75	2.87	3.19		2.47	2.92
Natural Gas	Low								2.43	2.41	2.31	2.30	2.55		2.38	2.38
(dollars per million Btu)	Mid	2.58	2.63	2.51	2.54	2.65	2.34	2.26	2.55	2.57	2.45	2.42	2.68	2.56	2.41	2.52
	High								2.65	2.75	2.63	2.58	2.86		2.44	2.69
Other Residential																
Natural Gas	Low								6.10	5.95	6.69	8.03	6.36		6.37	6.39
(dollars per thousand cubic feet)	Mid	5.70	6.46	7.88	6.22	6.05	6.95	7.82	6.22	6.05	6.84	8.13	6.45	6.15	6.40	6.49
	High								6.33	6.21	7.02	8.96	6.66		6.43	6.67
Electricity	Low								8.2	8.0	8.5	8.8	8.3		8.3	8.4
(cents per kilowatthour)	Mid	7.8	8.5	8.7	8.3	7.9	8.6	8.9	8.4	8.2	8.8	9.1	8.6	8.3	8.4	8.7
	High								8.8	8.8	9.4	9.7	9.2		8.7	9.3

[a] Cost of imported crude oil to U.S.
[b] Average for all grades and services.
[c] Average for all sulfur contents.
[d] Includes fuel oils No. 4, No. 5, and No. 6 and topped crude fuel oil prices.

Notes: Data are estimated for the third quarter of 1994. Prices exclude taxes, except prices for gasoline, residential natural gas, and diesel. Price cases are derived by simulating all energy product price models under the assumptions of the three world oil price cases using the mid macroeconomic case and normal weather assumptions for all simulations. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); and *Petroleum Marketing Monthly*, DOE/EIA-0380(94/09).

Table 6. U.S. Petroleum Supply and Demand: Low World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Crude Oil Supply															
Domestic Production [a]	6.96	6.84	6.72	6.87	6.75	6.62	6.56	6.53	6.41	6.23	6.10	6.08	6.85	6.61	6.21
Alaska	1.64	1.56	1.48	1.65	1.61	1.53	1.49	1.58	1.55	1.47	1.41	1.42	1.58	1.55	1.46
Lower 48	5.32	5.28	5.24	5.22	5.14	5.09	5.06	4.95	4.87	4.76	4.69	4.66	5.26	5.06	4.74
Net Imports (including SPR) [b]	6.17	6.87	6.77	6.94	6.13	7.04	7.52	6.82	6.68	7.49	7.86	7.46	6.69	6.88	7.37
Gross Imports (excluding SPR)	6.31	6.94	6.83	7.01	6.18	7.14	7.62	6.94	6.82	7.62	7.97	7.58	6.77	6.97	7.50
SPR Imports	0.01	0.04	0.01	0.00	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Exports	0.14	0.11	0.07	0.06	0.09	0.11	0.10	0.13	0.14	0.13	0.11	0.13	0.10	0.11	0.13
Other SPR Supply	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01
SPR Stock Withdrawn or Added (-)	-0.03	-0.06	-0.03	-0.02	-0.04	-0.02	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.03	-0.02	-0.01
Other Stock Withdrawn or Added (-)	-0.21	-0.17	0.34	-0.16	-0.02	0.17	-0.05	0.01	-0.09	-0.01	-0.02	0.04	-0.05	0.03	-0.02
Product Supplied and Losses	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Unaccounted-for Crude Oil	0.13	0.36	0.15	0.04	0.33	0.34	0.33	0.26	0.25	0.27	0.27	0.26	0.17	0.31	0.26
Total Crude Oil Supply	13.01	13.83	13.94	13.66	13.13	14.15	14.34	13.60	13.24	13.96	14.21	13.83	13.61	13.81	13.81
Other Supply															
NGL Production	1.77	1.76	1.74	1.67	1.65	1.71	1.72	1.75	1.74	1.72	1.72	1.74	1.74	1.71	1.73
Other Hydrocarbon and Alcohol Inputs	0.33	0.21	0.22	0.26	0.26	0.21	0.25	0.27	0.33	0.34	0.34	0.34	0.25	0.25	0.34
Crude Oil Product Supplied	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Processing Gain	0.78	0.73	0.78	0.76	0.70	0.76	0.83	0.77	0.74	0.78	0.80	0.78	0.76	0.77	0.78
Net Product Imports [c]	0.86	0.86	1.05	0.94	1.26	1.19	0.93	1.30	1.19	1.20	1.15	1.28	0.93	1.17	1.21
Gross Product Imports [c]	1.77	1.77	1.89	1.91	2.08	1.96	1.84	2.28	2.13	2.09	2.02	2.25	1.83	2.04	2.12
Product Exports	0.90	0.91	0.84	0.97	0.83	0.77	0.92	0.98	0.94	0.89	0.87	0.97	0.90	0.88	0.92
Product Stock Withdrawn or Added (-) [d]	0.26	-0.62	-0.30	0.37	0.83	-0.59	-0.53	0.22	0.67	-0.55	-0.24	0.15	-0.07	-0.02	0.01
Total Supply	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.92	17.93	17.46	17.99	18.14	17.24	17.68	17.88
Demand															
Motor Gasoline	7.04	7.57	7.75	7.53	7.19	7.68	7.70	7.58	7.46	7.68	7.96	7.76	7.48	7.54	7.72
Jet Fuel	1.46	1.45	1.49	1.48	1.51	1.53	1.53	1.57	1.53	1.54	1.58	1.56	1.47	1.53	1.55
Distillate Fuel Oil	3.33	2.83	2.82	3.19	3.53	3.03	2.93	3.21	3.46	3.05	2.97	3.22	3.04	3.17	3.17
Residual Fuel Oil	1.08	0.99	1.07	1.18	1.24	0.98	0.84	1.18	1.23	1.05	1.07	1.21	1.08	1.06	1.14
Other Oils [e]	4.10	3.95	4.31	4.31	4.35	4.22	4.54	4.37	4.26	4.14	4.41	4.39	4.17	4.37	4.30
Total Demand	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.92	17.93	17.46	17.99	18.14	17.24	17.68	17.88
Total Petroleum Net Imports	7.04	7.73	7.82	7.88	7.38	8.23	8.45	8.12	7.87	8.68	9.02	8.74	7.62	8.05	8.58
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) [f]	337	352	321	335	338	322	327	326	334	335	337	333	335	326	333
Total Motor Gasoline	230	221	208	226	214	212	210	224	220	221	213	223	226	224	223
Finished Motor Gasoline	189	184	171	187	176	177	173	184	180	184	174	183	187	184	183
Blending Components	41	37	37	39	38	35	37	39	40	38	39	39	39	39	39
Jet Fuel	42	45	41	40	38	42	45	43	44	43	43	46	40	43	46
Distillate Fuel Oil	97	110	131	141	100	120	145	149	104	107	126	141	141	149	141
Residual Fuel Oil	40	46	44	44	41	39	41	44	39	41	42	45	44	44	45
Other Oils [g]	265	310	334	273	257	291	311	272	264	310	320	274	273	272	274
Total Stocks (excluding SPR)	1013	1084	1080	1060	987	1025	1079	1058	1005	1056	1080	1062	1060	1058	1062
Crude Oil in SPR	578	583	586	587	590	592	592	593	594	596	597	598	587	593	598
Total Stocks (including SPR)	1590	1667	1665	1647	1578	1616	1671	1651	1600	1652	1677	1660	1647	1651	1660

[a] Includes lease condensate.
[b] Net imports equals gross imports plus SPR imports minus exports.
[c] Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.
[d] Includes an estimate of minor product stock change based on monthly data.
[e] Includes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.
[f] Includes crude oil in transit to refineries.
[g] Includes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.
SPR: Strategic Petroleum Reserve
NGL: Natural Gas Liquids
Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.
Sources: Historical data: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109(93/01-94/09); and *Weekly Petroleum Status Report*, DOE/EIA-0208(various issues).

Table 7. U.S. Petroleum Supply and Demand: Mid World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Crude Oil Supply															
Domestic Production [a]	6.96	6.84	6.72	6.87	6.75	6.62	6.56	6.70	6.67	6.52	6.44	6.45	6.85	6.65	6.52
Alaska	1.64	1.56	1.48	1.65	1.61	1.53	1.49	1.60	1.58	1.51	1.46	1.47	1.58	1.56	1.50
Lower 48	5.32	5.28	5.24	5.22	5.14	5.09	5.06	5.10	5.09	5.02	4.98	4.98	5.26	5.10	5.02
Net Imports (including SPR) [b]	6.17	6.87	6.77	6.94	6.13	7.04	7.52	6.63	6.37	7.13	7.50	6.98	6.69	6.83	7.00
Gross Imports (excluding SPR)	6.31	6.94	6.83	7.01	6.18	7.14	7.62	6.75	6.51	7.26	7.61	7.10	6.77	6.93	7.13
SPR Imports	0.01	0.04	0.01	0.00	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Exports	0.14	0.11	0.07	0.06	0.09	0.11	0.10	0.13	0.14	0.13	0.11	0.13	0.10	0.11	0.13
Other SPR Supply	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01
SPR Stock Withdrawn or Added (-)	-0.03	-0.06	-0.03	-0.02	-0.04	-0.02	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.03	-0.02	-0.01
Other Stock Withdrawn or Added (-)	-0.21	-0.17	0.34	-0.16	-0.02	0.17	-0.05	0.01	-0.09	-0.01	-0.02	0.04	-0.05	0.03	-0.02
Product Supplied and Losses	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Unaccounted-for Crude Oil	0.13	0.36	0.15	0.04	0.33	0.34	0.33	0.26	0.25	0.26	0.27	0.26	0.17	0.31	0.26
Total Crude Oil Supply	13.01	13.83	13.94	13.66	13.13	14.15	14.34	13.58	13.18	13.90	14.18	13.72	13.61	13.80	13.75
Other Supply															
NGL Production	1.77	1.76	1.74	1.67	1.65	1.71	1.72	1.75	1.74	1.72	1.72	1.74	1.74	1.71	1.73
Other Hydrocarbon and Alcohol Inputs	0.33	0.21	0.22	0.26	0.26	0.21	0.25	0.27	0.33	0.34	0.34	0.34	0.25	0.25	0.34
Crude Oil Product Supplied	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Processing Gain	0.78	0.73	0.78	0.76	0.70	0.76	0.83	0.77	0.74	0.78	0.80	0.78	0.76	0.77	0.77
Net Product Imports [c]	0.86	0.86	1.05	0.94	1.26	1.19	0.93	1.26	1.15	1.12	1.00	1.22	0.93	1.16	1.12
Gross Product Imports [c]	1.77	1.77	1.89	1.91	2.08	1.96	1.84	2.25	2.09	2.02	1.87	2.19	1.83	2.03	2.04
Product Exports	0.90	0.91	0.84	0.97	0.83	0.77	0.92	0.98	0.94	0.89	0.87	0.97	0.90	0.88	0.92
Product Stock Withdrawn or Added (-) [d]	0.26	-0.62	-0.30	0.37	0.83	-0.59	-0.53	0.22	0.67	-0.55	-0.24	0.15	-0.07	-0.02	0.01
Total Supply	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.86	17.83	17.32	17.81	17.96	17.24	17.67	17.73
Demand															
Motor Gasoline	7.04	7.57	7.75	7.53	7.19	7.68	7.70	7.55	7.40	7.62	7.89	7.68	7.48	7.53	7.65
Jet Fuel	1.46	1.45	1.49	1.48	1.51	1.53	1.53	1.57	1.53	1.53	1.58	1.55	1.47	1.53	1.55
Distillate Fuel Oil	3.33	2.83	2.82	3.19	3.53	3.03	2.93	3.21	3.45	3.04	2.95	3.21	3.04	3.17	3.16
Residual Fuel Oil	1.08	0.99	1.07	1.18	1.24	0.98	0.84	1.16	1.19	0.99	0.99	1.14	1.08	1.06	1.08
Other Oils [e]	4.10	3.95	4.31	4.31	4.35	4.22	4.54	4.37	4.25	4.13	4.40	4.38	4.17	4.37	4.29
Total Demand	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.86	17.83	17.32	17.81	17.96	17.24	17.67	17.73
Total Petroleum Net Imports	7.04	7.73	7.82	7.88	7.38	8.23	8.45	7.89	7.52	8.25	8.51	8.20	7.62	7.99	8.12
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) [f]	337	352	321	335	338	322	327	326	334	335	337	333	335	326	333
Total Motor Gasoline	230	221	208	226	214	212	210	224	220	221	213	223	226	224	223
Finished Motor Gasoline	189	184	171	187	176	177	173	184	180	184	174	183	187	184	183
Blending Components	41	37	37	39	38	35	37	39	40	38	39	39	39	39	39
Jet Fuel	42	45	41	40	38	42	45	43	44	43	43	46	40	43	46
Distillate Fuel Oil	97	110	131	141	100	120	145	149	104	107	126	141	141	149	141
Residual Fuel Oil	40	46	44	44	41	39	41	44	39	41	42	45	44	44	45
Other Oils [g]	265	310	334	273	257	291	311	272	264	310	320	274	273	272	274
Total Stocks (excluding SPR)	1013	1084	1080	1060	987	1025	1079	1058	1005	1056	1080	1062	1060	1058	1062
Crude Oil in SPR	578	583	586	587	590	592	592	593	594	596	597	598	587	593	598
Total Stocks (including SPR)	1590	1667	1665	1647	1578	1616	1671	1651	1600	1652	1677	1660	1647	1651	1660

[a] Includes lease condensate.

[b] Net imports equals gross imports plus SPR imports minus exports.

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

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

[e] Includes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.

[f] Includes crude oil in transit to refineries.

[g] Includes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.

SPR: Strategic Petroleum Reserve

NGL: Natural Gas Liquids

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, Petroleum Supply Monthly, DOE/EIA-0109(93/01-94/06); and Weekly Petroleum Status Report, DOE/EIA-0208(various issues).

Table 8. U.S. Petroleum Supply and Demand: High World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Crude Oil Supply															
Domestic Production [a]	6.96	6.84	6.72	6.87	6.75	6.62	6.56	6.86	6.89	6.77	6.70	6.75	6.85	6.70	6.78
Alaska	1.64	1.56	1.48	1.65	1.61	1.53	1.49	1.61	1.61	1.54	1.49	1.50	1.58	1.56	1.53
Lower 48	5.32	5.28	5.24	5.22	5.14	5.09	5.06	5.25	5.28	5.23	5.21	5.25	5.26	5.13	5.24
Net Imports (including SPR) [b]	6.17	6.87	6.77	6.94	6.13	7.04	7.52	6.45	6.10	6.83	7.19	6.62	6.69	6.79	6.69
Gross Imports (excluding SPR)	6.31	6.94	6.83	7.01	6.18	7.14	7.62	6.57	6.25	6.97	7.30	6.75	6.77	6.88	6.82
SPR Imports	0.01	0.04	0.01	0.00	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Exports	0.14	0.11	0.07	0.06	0.09	0.11	0.10	0.13	0.14	0.13	0.11	0.13	0.10	0.11	0.13
Other SPR Supply	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.01
SPR Stock Withdrawn or Added (-)	-0.03	-0.06	-0.03	-0.02	-0.04	-0.02	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.03	-0.02	-0.01
Other Stock Withdrawn or Added (-)	-0.21	-0.17	0.34	-0.16	-0.02	0.17	-0.05	0.01	-0.09	-0.01	-0.02	0.04	-0.05	0.03	-0.02
Product Supplied and Losses	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Unaccounted-for Crude Oil	0.13	0.36	0.15	0.04	0.33	0.34	0.33	0.26	0.25	0.26	0.27	0.26	0.17	0.31	0.26
Total Crude Oil Supply	13.01	13.83	13.94	13.66	13.13	14.15	14.34	13.56	13.15	13.85	14.13	13.65	13.61	13.80	13.70
Other Supply															
NGL Production	1.77	1.76	1.74	1.67	1.65	1.71	1.72	1.75	1.74	1.72	1.72	1.74	1.74	1.71	1.73
Other Hydrocarbon and Alcohol Inputs	0.33	0.21	0.22	0.26	0.26	0.21	0.25	0.27	0.33	0.34	0.34	0.34	0.25	0.25	0.34
Crude Oil Product Supplied	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Processing Gain	0.78	0.73	0.78	0.76	0.70	0.76	0.83	0.77	0.73	0.78	0.80	0.77	0.76	0.77	0.77
Net Product Imports [c]	0.86	0.86	1.05	0.94	1.26	1.19	0.93	1.23	1.12	1.09	0.96	1.19	0.93	1.15	1.09
Gross Product Imports [c]	1.77	1.77	1.89	1.91	2.08	1.96	1.84	2.22	2.06	1.98	1.83	2.16	1.83	2.03	2.01
Product Exports	0.90	0.91	0.84	0.97	0.83	0.77	0.92	0.98	0.94	0.89	0.87	0.97	0.90	0.88	0.92
Product Stock Withdrawn or Added (-) [d]	0.26	-0.62	-0.30	0.37	0.83	-0.59	-0.53	0.22	0.67	-0.55	-0.24	0.15	-0.07	-0.02	0.01
Total Supply	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.82	17.76	17.23	17.71	17.86	17.24	17.66	17.64
Demand															
Motor Gasoline	7.04	7.57	7.75	7.53	7.19	7.68	7.70	7.52	7.36	7.58	7.85	7.64	7.48	7.52	7.61
Jet Fuel	1.46	1.45	1.49	1.48	1.51	1.53	1.53	1.57	1.52	1.53	1.58	1.55	1.47	1.53	1.55
Distillate Fuel Oil	3.33	2.83	2.82	3.19	3.53	3.03	2.93	3.21	3.45	3.03	2.95	3.20	3.04	3.17	3.16
Residual Fuel Oil	1.08	0.99	1.07	1.18	1.24	0.98	0.84	1.14	1.16	0.95	0.94	1.10	1.08	1.05	1.04
Other Oils [e]	4.10	3.95	4.31	4.31	4.35	4.22	4.54	4.38	4.26	4.13	4.40	4.38	4.17	4.37	4.29
Total Demand	17.02	16.79	17.44	17.68	17.82	17.45	17.54	17.82	17.76	17.23	17.71	17.86	17.24	17.66	17.64
Total Petroleum Net Imports	7.04	7.73	7.82	7.88	7.38	8.23	8.45	7.68	7.22	7.92	8.15	7.81	7.62	7.94	7.78
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) [f]	337	352	321	335	338	322	327	326	334	335	337	333	335	326	333
Total Motor Gasoline	230	221	208	226	214	212	210	224	220	221	213	223	226	224	223
Finished Motor Gasoline	189	184	171	187	176	177	173	184	180	184	174	183	187	184	183
Blending Components	41	37	37	39	38	35	37	39	40	38	39	39	39	39	39
Jet Fuel	42	45	41	40	38	42	45	43	44	43	43	46	40	43	46
Distillate Fuel Oil	97	110	131	141	100	120	145	149	104	107	126	141	141	149	141
Residual Fuel Oil	40	46	44	44	41	39	41	44	39	41	42	45	44	44	45
Other Oils [g]	265	310	334	273	257	291	311	272	264	310	320	274	273	272	274
Total Stocks (excluding SPR)	1013	1084	1080	1060	987	1025	1079	1058	1005	1056	1080	1062	1060	1058	1062
Crude Oil in SPR	578	583	586	587	590	592	592	593	594	596	597	598	587	593	598
Total Stocks (including SPR)	1590	1667	1665	1647	1578	1616	1671	1651	1600	1652	1677	1660	1647	1651	1660

[a] Includes lease condensate.
[b] Net imports equals gross imports plus SPR imports minus exports.
[c] Includes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.
[d] Includes an estimate of minor product stock change based on monthly data.
[e] Includes crude oil product supplied, natural gas liquids, liquefied refinery gas, other liquids, and all finished petroleum products except motor gasoline, jet fuel, distillate, and residual fuel oil.
[f] Includes crude oil in transit to refineries.
[g] Includes stocks of all other oils such as aviation gasoline, kerosene, natural gas liquids (including ethane), aviation gasoline blending components, naphtha and other oils for petrochemical feedstock use, special naphthas, lube oils, wax, coke, asphalt, road oil, and miscellaneous oils.
SPR: Strategic Petroleum Reserve
NGL: Natural Gas Liquids
Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.
Sources: Historical data: Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109(93/01-94/09); and *Weekly Petroleum Status Report*, DOE/EIA-0208(various issues).

Table 9. U.S. Petroleum Demand Sensitivities

	1994	1995
	One Quarter[a]	Four Quarters[a]
Economic Activity		
Gross Domestic Product (billion 1987 dollars)	5,361 - 5,393	5,342 - 5,527
Resulting Change in Petroleum Demand (million barrels per day)[b]	0.08	0.47
Energy Prices		
Imported Crude Oil (nominal dollars per barrel)[c]	$14.01 - $18.83	$13 - $19.90
Resulting Change in Petroleum Demand (million barrels per day)[b]		
Due to Changes in the Crude Oil Price	-0.11	-0.24
Weather		
Heating Degree-Days[d]	16.39 - 19.97	20.28 - 23.99
Resulting Change in Petroleum Demand (million barrels per day)	0.30	0.33
Cooling Degree-Days[d]	-	5.57 - 6.58
Resulting Change in Petroleum Demand (million barrels per day)[b]	-	0.07

[a] In the weather case, calculations apply to certain quarters only, as follows: for heating degree-days: for 1994, the fourth quarter only is used; for 1995: the average of first and fourth quarters only are used; for cooling degree-days in 1994, the third quarter only is used; in 1995, the average of the second and third quarters is used.
[b] Ranges of petroleum product supplied associated with varying each determinant (or determinants), holding other things equal.
[c] Cost of imported crude oil to U.S. refiners.
[d] Heating and cooling degree-days are U.S. 1990 population-weighted.
Source: Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division, Short-Term Integrated Forecasting System.

Table 10. Forecast Components for U.S. Crude Oil Production
(Million Barrels per Day)

	High Price Case	Low Price Case	Difference		
			Total	Uncertainty	Price Impact
United States	6.75	6.08	0.67	0.14	0.53
Lower 48 States	5.25	4.66	0.59	0.11	0.48
Alaska	1.50	1.42	0.08	0.03	0.05

Note: Components provided are for the fourth quarter 1995; totals are from Tables 6 and 8. Totals may not add to sum of components due to independent rounding.
Source: Energy Information Administration, Office of Oil and Gas, Reserves and Natural Gas Division.

Table 11. U.S. Natural Gas Supply and Demand: Mid World Oil Price Case
(Trillion Cubic Feet)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Total Dry Gas Production [a]	4.59	4.52	4.55	4.69	4.69	4.62	4.73	4.76	4.74	4.70	4.75	4.82	18.35	18.81	19.01
Net Imports	0.55	0.51	0.55	0.60	0.60	0.59	0.58	0.68	0.72	0.65	0.61	0.71	2.21	2.46	2.70
Supplemental Gaseous Fuels	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.04	0.03	0.03	0.04	0.13	0.13	0.13
Total New Supply	5.18	5.06	5.12	5.32	5.33	5.25	5.34	5.48	5.51	5.39	5.39	5.56	20.69	21.39	21.84
Gas in Underground Storage															
Opening	6.64	5.23	6.16	7.16	6.66	5.30	6.24	7.23	6.69	5.46	6.28	7.14	6.64	6.66	6.69
Closing	5.23	6.16	7.16	6.66	5.30	6.24	7.23	6.69	5.46	6.28	7.14	6.73	6.66	6.69	6.73
Net Withdrawals	1.41	-0.93	-1.00	0.50	1.36	-0.94	-0.99	0.54	1.23	-0.81	-0.86	0.41	-0.02	-0.03	-0.04
Total Supply [a]	6.59	4.14	4.12	5.82	6.70	4.31	4.35	6.02	6.73	4.57	4.53	5.97	20.67	21.37	21.80
Balancing Item [b]	0.04	0.13	-0.07	-0.47	0.20	0.13	-0.12	-0.59	0.11	0.28	-0.27	-0.47	-0.37	-0.38	-0.35
Total Primary Supply [a]	6.63	4.27	4.05	5.35	6.89	4.44	4.22	5.43	6.84	4.85	4.26	5.50	20.30	20.98	21.45
Demand															
Lease and Plant Fuel	0.30	0.30	0.30	0.31	0.31	0.30	0.30	0.31	0.32	0.30	0.30	0.31	1.20	1.23	1.24
Pipeline Use	0.20	0.13	0.12	0.16	0.21	0.13	0.13	0.16	0.19	0.15	0.14	0.16	0.61	0.63	0.64
Residential	2.31	0.85	0.39	1.41	2.44	0.83	0.44	1.34	2.32	0.99	0.45	1.37	4.96	5.05	5.12
Commercial	1.20	0.54	0.36	0.80	1.28	0.55	0.35	0.77	1.22	0.58	0.36	0.78	2.91	2.96	2.95
Industrial (Incl. Cogenerators)	2.04	1.80	1.87	1.98	2.08	1.82	1.94	2.11	2.16	1.97	1.95	2.13	7.69	7.96	8.21
Cogenerators [c]	0.42	0.42	0.46	0.46	0.47	0.50	0.49	0.48	0.50	0.53	0.52	0.51	1.77	1.94	2.06
Electricity Production															
Electric Utilities	0.52	0.60	0.95	0.62	0.51	0.74	0.98	0.66	0.56	0.78	0.98	0.67	2.68	2.89	2.99
Nonutilities (Excl. Cogen.)	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.25	0.28	0.31
Total Demand	6.63	4.27	4.05	5.35	6.89	4.44	4.22	5.43	6.84	4.85	4.26	5.50	20.30	20.98	21.45

[a] Excludes nonhydrocarbon gases removed.

[b] The balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

[c] Quarterly estimates and projections for gas consumption by nonutility generators are based on estimates for quarterly gas-fired generation at nonutilities, supplied by the Office of Coal, Nuclear, Electric and Alternate Fuels, Energy Information Administration (EIA), based on Annual data reported to EIA on Form EIA-867. Detail on Independent power producers share of nonutility generation derived from reference case simulation of the National Energy Modeling System, Office of Integrated Analysis and Forecast, Energy Information Administration.

Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); *Natural Gas Monthly*, DOE/EIA-0130(94/08); *Electric Power Monthly*, DOE/EIA-0226(94/08); Form EIA-867(annual nonutility items).

Table 12. U.S. Coal Supply and Demand: Mid World Oil Price Case
(Million Short Tons)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Production	243.4	233.8	227.1	241.1	254.3	256.3	256.1	255.7	257.8	258.8	255.9	259.1	945.4	1022.4	1031.6
Primary Stock Levels [a]															
Opening	34.0	38.5	34.8	27.2	25.3	34.1	35.8	33.0	31.0	32.0	33.0	32.0	34.0	25.3	31.0
Closing	38.5	34.8	27.2	25.3	34.1	35.8	33.0	31.0	32.0	33.0	32.0	32.0	25.3	31.0	32.0
Net Withdrawals	-4.5	3.6	7.6	1.9	-8.8	-1.7	2.8	2.0	-1.0	-1.0	1.0	0.0	8.7	-5.7	-1.0
Imports	1.2	1.1	2.1	2.9	1.8	1.6	1.7	1.8	1.7	1.7	1.8	1.8	7.3	6.9	6.9
Exports	18.9	19.9	18.5	17.2	14.9	15.8	17.0	17.3	18.2	18.8	18.3	19.0	74.5	65.0	74.4
Total Net Domestic Supply	221.3	218.5	218.4	228.7	232.4	240.4	243.6	242.1	240.3	240.7	240.3	241.9	886.9	958.6	963.2
Secondary Stock Levels [b]															
Opening	163.7	152.6	154.8	121.9	120.5	112.1	126.5	122.5	126.9	128.1	140.9	134.0	163.7	120.5	126.9
Closing	152.6	154.8	121.9	120.5	112.1	126.5	122.5	126.9	128.1	140.9	134.0	135.8	120.5	126.9	135.8
Net Withdrawals	11.1	-2.2	32.9	1.5	8.3	-14.3	4.0	-4.5	-1.1	-12.8	6.9	-1.8	43.2	-6.5	-8.9
Total Supply	232.4	216.3	251.3	230.2	240.7	226.0	247.6	237.7	239.1	227.9	247.2	240.1	930.2	952.1	954.3
Demand															
Coke Plants	7.8	7.9	8.0	7.7	7.4	7.6	7.6	7.4	7.5	7.7	7.7	7.5	31.3	30.0	30.4
Electric Utilities	200.3	187.7	223.1	202.3	207.9	196.3	220.9	208.4	210.1	201.0	220.8	210.9	813.5	833.5	842.8
Retail and General Industry [c]	21.1	19.2	18.8	22.1	22.0	19.4	19.1	21.9	21.5	19.2	18.7	21.7	81.1	82.5	81.1
Total Demand	229.2	214.8	249.9	232.1	237.3	223.3	247.6	237.7	239.1	227.9	247.2	240.1	925.9	946.0	954.3
Discrepancy [d]	3.2	1.5	1.5	-1.9	3.4	2.7	0.0	0.0	0.0	0.0	0.0	0.0	4.2	6.1	0.0

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

[b] Secondary stocks are held by users.

[c] Synfuels plant demand in 1992 was 1.7 million tons per quarter, and is assumed to remain at that level in 1993, 1994, and 1995.

[d] Historical period discrepancy reflects an unaccounted-for shipper and receiver reporting difference.

Notes: Rows and columns may not add due to independent rounding. Zeros indicate amounts of less than 500,000 tons. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); and *Quarterly Coal Report*, DOE/EIA-0221(94/2Q).

Table 13. U.S. Electricity Supply and Demand: Mid World Oil Price Case
(Billion Kilowatthours)

	1993				1994				1995				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1993	1994	1995
Supply															
Net Utility Generation															
Coal	404.8	378.7	448.6	407.0	417.4	393.6	442.8	419.6	423.9	406.2	441.8	424.3	1639.2	1673.4	1696.3
Petroleum	22.7	18.3	33.1	25.4	32.2	24.5	29.0	24.8	29.7	23.6	28.5	24.6	99.5	110.6	106.4
Natural Gas	50.4	56.9	90.9	60.7	49.6	71.7	92.8	62.6	53.0	73.8	92.8	63.2	258.9	276.6	282.8
Nuclear	157.0	146.2	162.7	144.4	154.6	143.5	171.3	156.2	156.0	137.5	168.8	155.5	610.3	625.6	617.8
Hydroelectric	67.8	81.1	60.3	55.9	61.1	70.9	56.9	58.0	68.3	73.9	62.2	62.5	265.1	246.9	266.9
Geothermal and Other [a]	2.5	2.2	2.4	2.4	2.3	2.1	2.2	2.2	2.1	2.0	2.1	2.1	9.6	8.8	8.3
Subtotal	705.2	683.4	798.0	695.9	717.2	706.3	795.0	723.5	732.9	717.1	796.2	732.3	2882.5	2942.0	2978.5
Nonutility Generation [b]															
Coal	12.7	12.8	13.9	14.0	13.9	14.7	14.6	14.4	14.9	15.7	15.6	15.3	53.4	57.6	61.6
Petroleum	3.2	3.2	3.5	3.5	3.5	3.7	3.7	3.6	3.8	4.0	4.0	3.9	13.4	14.4	15.8
Natural Gas	41.4	41.7	45.5	45.7	46.0	48.6	48.3	47.4	49.1	51.9	51.5	50.6	174.3	190.3	203.2
Renewables/Other	20.0	20.1	22.0	22.1	22.3	23.6	23.4	23.0	23.6	24.9	24.7	24.3	84.2	92.2	97.5
Subtotal	77.2	77.8	85.0	85.3	85.7	90.6	89.9	88.3	91.4	96.6	95.9	94.2	325.2	354.6	378.1
Total Generation	782.4	761.2	883.0	781.2	803.0	796.9	884.9	811.8	824.4	813.7	892.1	826.5	3207.8	3296.6	3356.6
Net Imports	6.6	3.4	10.1	8.4	11.4	9.8	12.4	10.0	10.5	9.4	10.4	9.2	28.4	43.7	39.4
Total Supply	789.0	764.6	893.1	789.5	814.4	806.7	897.3	821.8	834.8	823.1	902.5	835.6	3236.2	3340.3	3396.1
Lost and Unaccounted for [c]	51.1	63.0	59.6	62.4	46.5	83.2	50.2	57.4	50.0	63.4	59.3	59.3	236.1	237.4	232.0
Demand															
Electric Utility Sales															
Residential	260.1	210.1	292.1	231.2	273.7	219.6	286.3	241.6	269.4	235.1	278.7	247.0	993.6	1021.2	1030.2
Commercial	186.8	189.0	224.0	189.9	194.6	197.4	234.2	207.0	205.1	206.1	235.0	211.3	789.7	833.2	857.6
Industrial	234.9	246.4	256.0	245.8	240.3	246.3	263.9	255.1	249.0	255.5	265.1	255.6	983.1	1005.6	1025.2
Other	23.4	23.1	25.4	24.0	23.6	22.6	25.3	24.0	24.0	23.4	25.2	23.9	95.9	95.5	96.5
Subtotal	705.2	668.6	797.5	691.0	732.2	685.9	809.7	727.7	747.5	720.2	804.0	737.9	2862.3	2955.5	3009.4
Nonutility Gener. for Own Use [b]	32.7	33.0	36.0	36.1	35.6	37.7	37.4	36.7	37.4	39.5	39.2	38.5	137.8	147.4	154.6
Total Demand	737.9	701.6	833.5	727.1	767.9	723.5	847.1	764.4	784.8	759.7	843.2	776.4	3000.1	3102.9	3164.0
Memo:															
Utility Purchases from															
Nonutilities [b]	44.5	44.8	49.0	49.1	50.1	52.9	52.6	51.6	54.1	57.1	56.7	55.7	187.4	207.2	223.6

[a] Other includes generation from wind, wood, waste, and solar sources.
[b] Electricity received from nonutility sources, including cogenerators and small power producers. Quarterly estimates and projections for nonutility net sales, own use, and generation by fuel source supplied by the Office of Coal, Nuclear, Electric and Alternate Fuels, Energy Information Administration (EIA), based on annual data reported to EIA on Form EIA-867.
[c] Balancing item, mainly transmission and distribution losses.
Notes: Minor discrepancies with other EIA published historical data are due to rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.
Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(94/09); *Electric Power Monthly*, DOE/EIA-0226(94/08); Form EIA-867 (annual nonutility items).

Table 14. U.S. Renewable Energy Use by Sector: Mid World Oil Price Case
(Quadrillion Btu)

	Year				Annual Percentage Change		
	1992	1993	1994	1995	1992-1993	1993-1994	1994-1995
Electric Utilities							
Hydroelectric Power [a]	2.511	2.778	2.588	2.797	10.6	-6.8	8.1
Geothermal Energy	0.170	0.159	0.145	0.137	-6.6	-9.0	-5.2
Biofuels [b]	0.022	0.021	0.020	0.019	-4.9	-2.3	-7.2
Solar and Wind Energy [c]	0.000*	0.000*	0.000*	0.000*	16.3	8.0	4.0
Total	2.703	2.958	2.753	2.953	9.4	-6.9	7.3
Nonutility Power Generator							
Hydroelectric Power [a]	0.098	0.119	0.124	0.134	21.9	3.9	8.6
Geothermal, Solar and Wind Energy	0.126	0.142	0.156	0.167	12.6	10.0	6.8
Biofuels [b]	0.555	0.577	0.633	0.664	4.0	9.7	5.0
Total	0.779	0.838	0.913	0.966	7.6	8.9	5.8
Total Power Generation	3.482	3.796	3.666	3.919	9.0	-3.4	6.9
Other Sectors							
Residential and Commercial [d]	0.710	0.728	0.731	0.765	2.5	0.5	4.6
Industrial [e]	1.472	1.489	1.542	1.616	1.1	3.6	4.8
Transportation [f]	0.079	0.076	0.076	0.088	-3.4	-0.3	16.2
Total	2.261	2.292	2.349	2.468	1.4	2.5	5.1
Net Imported Electricity [g]	0.293	0.294	0.452	0.408	0.3	53.7	-9.7
Total Renewable Energy Demand	6.036	6.383	6.467	6.795	5.7	1.3	5.1

[a] Conventional hydroelectric power only. Hydroelectricity generated by pumped storage is not included in renewable energy.

[b] Biofuels are fuelwood, wood byproducts, waste wood, municipal solid waste, manufacturing process waste, and alcohol fuels.

[c] Also includes photovoltaic thermal energy.

[d] Includes biofuels and solar energy consumed in the residential and commercial sectors.

[e] Includes industrial hydroelectric power, geothermal energy, biofuels, solar and wind energy consumed in the industrial sector, including consumption by nonutility power generators.

[f] Ethanol blended into gasoline.

[g] Net imports of electricity are included in renewables because they stem principally from hydroelectric power generators in Canada. However, it should be noted that in actuality, only about 76 percent of gross imports of electricity from Canada were attributable to renewable energy sources, based on statistics from Natural Resources Canada, *Electric Power in Canada, 1992,* (Ottawa: 1993), p. 87.

* Less than 500 billion Btu.

Notes: Minor discrepancies with other published EIA historical data are due to independent rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System.

Sources: Historical data: 1992: Energy Information Administration, *Annual Energy Review, 1993,* DOE/EIA-0384(93); 1993: Estimates derived from Energy Information Administration, Short-Term Integrated Forecasting System database, fourth quarter 1994 and Office of Coal, Nuclear, Electric and Alternate Fuels Energy Information Administration; Projections: renewables growth in sectors other than electric utilities taken from Energy Information Administration, *Annual Energy Outlook 1994* database and Office of Coal, Nuclear, Electric and Alternate Fuels Energy Information Administration.

Computation of Petroleum Demand Sensitivities

Table 9 summarizes the response of forecasts of U.S. total petroleum demand to changes in assumptions for economic growth, world crude oil prices, and weather. The values in this table are computed using the Short-Term Integrated Forecasting Model (STIFS). The STIFS model is documented in EIA's *Short-Term Integrated Forecasting System: 1993 Model Documentation Report* (DOE/EIA-M041, May 1993). The purpose of the model is to generate forecasts of U.S. energy supply, demand, and prices. Key inputs include assumptions for the imported price of crude oil, the rate of U.S. economic growth, and weather (cooling and heating degree-days). Forecasts are generated for production, imports, exports, demand, and prices for refined petroleum products, natural gas, coal, and electricity.

A key relationship shown in Table 9 is that between petroleum demand and economic activity. Gross domestic product (GDP) is varied from low to high for each of the two projection years, and the resulting change in petroleum demand is calculated. For each of the 2 years, the percentage difference in GDP is computed as the difference between the low and high case levels shown in Table 2, divided by the midpoint of this range. Thus, the percentage difference in GDP for 1994 is as follows: (5327 - 5319) / ((5327 + 5319) / 2), or 0.2 percent. For each period, the petroleum demand difference (in million barrels per day) is divided by the percentage difference in GDP. For 1994, the average petroleum demand difference is 20,000 barrels per day; thus, a 1-percent change in GDP corresponds to a change in demand of

(20,000/0.2), or 100,000 barrels per day. For 1995, a 3.4-percent change in GDP corresponds to a change in demand of 470,000 barrels per day; thus, a 1-percent change in GDP corresponds to a demand change of 138,000 barrels per day. The average of the 1994 and 1995 results (weighting the 1994 by 92 days and 1995 results by 365 days) is 130,000 barrels per day per 1 percent difference in GDP. Table 9 also shows the differences in petroleum demand due to changes in energy prices caused by varying the world crude oil price. The change in petroleum demand (in million barrels per day) is divided by the change in the crude oil price (in dollars per barrel), and the result is averaged over the two projection years to get an estimate of the change in petroleum demand per dollar of change in the crude oil price.

The influence of weather on petroleum demand is also calculated, using the mid-case values for economic activity and imported crude oil prices. The percentage changes in heating or cooling degree-days are computed and divided by the changes in petroleum demand, and the result is averaged over the two projection periods to get an estimate of the change in petroleum demand per 1-percent change in heating and cooling degree-days. The changes in demand due to changes in heating degree-days apply only to the heating season, roughly the first and fourth quarters of the year, while the changes in demand due to changes in cooling degree-days apply only to the cooling season, roughly the second and third quarters of the year.

Text References and Notes

1994-1995 Winter Fuels Outlook

[1]Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S5.

[2]Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130, Table 4.

[3]Compiled from monthly data used in publication of Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0130, Table 4.

[4]Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S5.

[5]Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130, Table 4, and monthly information on natural gas productive capacity provided by the Energy Information Administration, Reserves and Natural Gas Division.

International Oil Demand

[6]Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

International Oil Supply

[7]Excess capacity data by country provided by Energy Information Administration, Energy Markets and Contingency Information Division.

World Oil Stocks and Net Trade

[8]Based on comparison of 1992 ending stocks data in Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340(92/1) and estimates for 1993 ending stocks given in Table 7.

U.S. Oil Supply

[9]Estimate provided by the Energy Information Administration, Reserves and Natural Gas Division.

[10]Estimate provided by the Energy Information Administration, Reserves and Natural Gas Division.

[11]Drilling rig projections provided by the Energy Information Administration, Reserves and Natural Gas Division.

[12]Energy Information Administration, *Petroleum Supply Annual 1993*, Volume 1, DOE/EIA-0340(93)/1 (Washington, DC, June 1994), p. 6.

[13]Table 7 and Energy Information Administration, *Petroleum Supply Annual 1993* (DOE/EIA-0202), various issues.

[14]Detailed documentation of the U.S. crude oil production forecasting models is available in Energy Information Administration, *Short-Term Integrated Forecasting System, 1993 Model Documentation Report*, DOE/EIA-M041(93) (Washington, DC, May 1993). During the six quarters through the fourth quarter 1993, the average absolute error of the quarterly domestic crude oil production forecast was 1.3 percent, Energy Information Administration, *Short-Term Energy Outlook Annual Supplement, 1994*, DOE/EIA-0202(94) (Washington, DC, August 1994), p.58.

[15]Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1993 Annual Report*, DOE/EIA-0216(93) (Washington, DC).

[16]Based on comparison of stocks data for ending 1992 in Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340(92/1) and estimates for 1993 ending stocks given in Table 7.

[17]Based on comparison of stocks data for ending 1992 in Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340(92/1) and estimates for 1993 ending stocks given in Table 7.

[18]Drilling rig projections provided by the Energy Information Administration, reserves and Natural Gas Division. Historical Baker Hughes rig counts from EIA, *Annual Energy Review 1993*, (DOE/EIA-0384(93) (Washington, DC, July 1994).

[19]Energy Information Administration, *Advance Summary, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1993 Annual Report*, DOE/EIA-0216(93)Advance Summary (Washington, DC, August 1994).

U.S. Energy Prices

[20]See Energy Information Administration, *U.S. Energy Industry Financial Developments, 1994 First Quarter*, DOE/EIA-0543 (94/2Q).

[21]Energy Information Administration, *Short-Term Energy Outlook Annual Supplement 1994*, DOE/EIA-0202(94), "Demand, Supply and Price Outlook for Reformulated Gasoline, 1995."

[22]*Natural Gas Week*, October 3, 1994.

[23]*Wall Street Journal*, "Futures Prices", p. C18, October 20, 1994.

[24]See Energy Information Administration, *Natural Gas Productive Capacity for the Lower 48 States, 1983 through 1995*, DOE/EIA-00542 (94); *Natural Gas 1994 Issues and Trends*, DOE/EIA-0560(94), Chapters 1, 2, and 4; *Natural Gas 1992 Issues and Trends*, DOE/EIA-0560(92), Chapter 7.

U.S. Natural Gas Supply

[25]Cited in *Natural Gas Intelligence*, June 13, 1994.

[26]Energy Information Administration, *Natural Gas 1994: Issues and Trends*, DOE/EIA-0560(94), July 1994.

U.S. Renewable Energy Demand

[27]While it is generally true that the majority of these imports stem from hydroelectric power output in Canada, in 1992 about 24 percent of the gross electricity imports from Canada were estimated to be associated with nonrenewable energy sources, Natural Resources Canada, **Electric Power in Canada 1992** (Ottawa, Ontario, 1993), p.87.

Figure References _____

The following is a list of references for the figures appearing in this issue of the *Short-Term Energy Outlook*. Except where noted, all data for figures are taken from datasets containing monthly values of each variable depicted, aggregated to quarterly or annual values as required using appropriate weights. The datasets are created by particular runs of the Short-Term Integrated Forecasting System (STIFS) Model, depending on the scenario or set of scenarios depicted. Also, except when noted, all figures refer to the base or "BBB" case. Other cases referred to are: the high world oil price "BHB"; low world oil price "BLB"; severe weather "BBS"; mild weather "BBL"; strong economic growth "HBB"; weak economic growth "LBB"; weak economic growth with high world oil prices "WHB"; and strong economic growth with low world oil prices "PLB."

1. **History:** Import cost: Compiled from monthly data for the refiner acquisition cost of imported crude oil used in publication of Energy Information Administration, *Petroleum Marketing Annual 1991*, DOE/EIA-0487(91) and *Petroleum Marketing Annual 1992*, DOE/EIA-0487(92), Table 1 for historical series; for recent values, *Petroleum Marketing Monthly*, DOE/EIA-0380, Table 1; West Texas Intermediate spot price, *Oil and Gas Journal* Database, June 22, 1994. **Projections:** Fourth quarter 1994 STIFS database, BBB, BLB, and BHB cases; and Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

2. **History:** Manufacturing Production: Federal Reserve System, Statistical Release G 17; GDP: U.S. Department of Commerce Bureau of Economic Analysis, *National Income and Product Accounts of the U.S.* **Projections:** DRI/McGraw-Hill Forecast CONTROL0994, modified by EIA's Office of Integrated Analysis and Forecasting with STIFS energy price forecasts.

3. **History:** Compiled from annual data used in publication of Energy Information Administration, *International Energy Annual*, DOE/EIA-0219, Table 8 for historical series; for recent values, *International Petroleum Statistics Report*, DOE/EIA-0520, Table 2.4; Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Administration. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

4. **History:** Compiled from annual data used in publication of Energy Information Administration, *International Energy Annual*, DOE/EIA-0219(92), Table 8 for historical series; for recent values, *International Petroleum Statistics Report*, DOE/EIA-0520, Table 2.4; and Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Administration. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

5. **History:** Compiled from annual data used in publication of Energy Information Administration, *International Petroleum Statistics Report*, DOE/EIA-0520, Table 4.1 for historical series and recent data; and Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

6. **History:** Compiled from annual data used in publication of Energy Information Administration, *International Petroleum Statistics Report*, DOE/EIA-0520, Table 4.2 for historical series and recent data; Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and

Contingency Information Administration. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

7. **History:** Compiled from annual data used in publication of Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035, Table 10.3 for historical series and recent data. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

8. **History:** Compiled from annual data used in publication of Energy Information Administration, *International Energy Annual*, DOE/EIA-0219(92), Table 1; Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division. **Projections:** Energy Information Administration, Office of Energy Markets and End Use, Energy Markets and Contingency Information Division.

9. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Tables S4 through S10; *Petroleum Supply Monthly*, DOE/EIA-0109, Tables S4 through S10, adjusted in years prior to 1993 for new (1993) reporting basis for fuel ethanol blended into motor gasoline (See *Short-Term Energy Outlook*, DOE/EIA-0202(93/3Q), Appendix B). **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

10. **History:** Travel: Compiled from monthly data used in the Federal Highway Administration publication, *Traffic Volume Trends*; Demand: Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Table S4 for historical series, adjusted for 1993 reporting basis (see note 9 above); for recent values, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S4; MPG is calculated as Travel (in miles)/Demand (in gallons). **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

11. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Table S1 for historical series; for recent values, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S1. **Projections:** Fourth quarter 1994 STIFS database, cases "BBB," "WHB," and "PLB;" and EIA's Reserves and Natural Gas Division.

12. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Table S1 for historical series; for recent values, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S1. **Projections:** Fourth quarter 1994 STIFS database, case "BBB." The imports share variable is calculated as the ratio of total net petroleum imports divided by total petroleum demand.

13. Energy Information Administration, "U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1993 Annual Report," DOE/EIA-0216(93), Washington, D.C.

14. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487, Tables 2, 4, and, 15, for historical series; for recent values, *Petroleum Marketing Monthly*, DOE/EIA-0380, Tables 2, 4 and 15. **Projections:** Fourth quarter 1994 STIFS database.

15. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Marketing Annual*, DOE/EIA-0487, Tables 2, 4, and, 15, for historical series; for recent values, *Petroleum Marketing Monthly*, DOE/EIA-0380, Tables 2, 4 and 15. **Projections:** Fourth quarter 1994

Figure References

STIFS database. Gross margins are defined, for the purpose of Figure 14, as the difference between the refiner price for a fuel less the composite refiner acquisition cost of crude oil (CRAC), where the prices and the CRAC are on a per-gallon basis. The CRAC refers to the cost reported in Table 1 in Energy Information Administration, *Petroleum Marketing Monthly*, DOE/EIA-0380. Temporal aggregations (to quarterly values) involve monthly quantity weights corresponding to monthly barrels of refinery production of the respective fuels. The average for major products is a weighted average of motor gasoline, number 2 fuel oil, jet fuel and residual fuel oil, where the weights are respective refinery output volumes. Refinery outputs are compiled in the STIFS database from monthly data regularly reported in Energy Information Administration, *Petroleum Supply Monthly*, DOE/EIA-0109.

16. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130, Table 4. **Projections:** Fourth quarter 1994 STIFS database, cases "BBB," "BLB," and "BHB."

17. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130, Table 4. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

18. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226, Table 34. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

19. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Electric Power Monthly*, DOE/EIA-0226, Table 60. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

20. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Table S1 for historical series adjusted for 1993 reporting basis (see note 9 above); for recent values, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S1. **Projections:** Fourth quarter 1994 STIFS database, cases "BBB," "BBS," and "BBL."

21. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Petroleum Supply Annual, Volume 1*, DOE/EIA-0340/1, Table S1 for historical series adjusted for 1993 reporting basis (see note 9 above); for recent values, *Petroleum Supply Monthly*, DOE/EIA-0109, Table S1. **Projections:** Fourth quarter STIFS database, cases "BBB," "HBB," and "LBB."

22. **History:** Nonutility Generators, 1989-1993: Energy Information Administration, Form EIA-867 (1993 preliminary); other volumes compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Annual, Volume 2*, DOE/EIA-0131, Table 3 for historical series; for recent values, Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130. **Projections:** Nonutility Generators: Office of Coal, Nuclear, Electric and Alternate Fuels, Energy Information Administration; other volumes: Fourth quarter 1994 STIFS database, case "BBB."

23. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Annual, Volume 2*, DOE/EIA-0131, Table 3 for historical series; for recent values, Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130. **Projections:** Fourth quarter 1994 database, case "BBB."
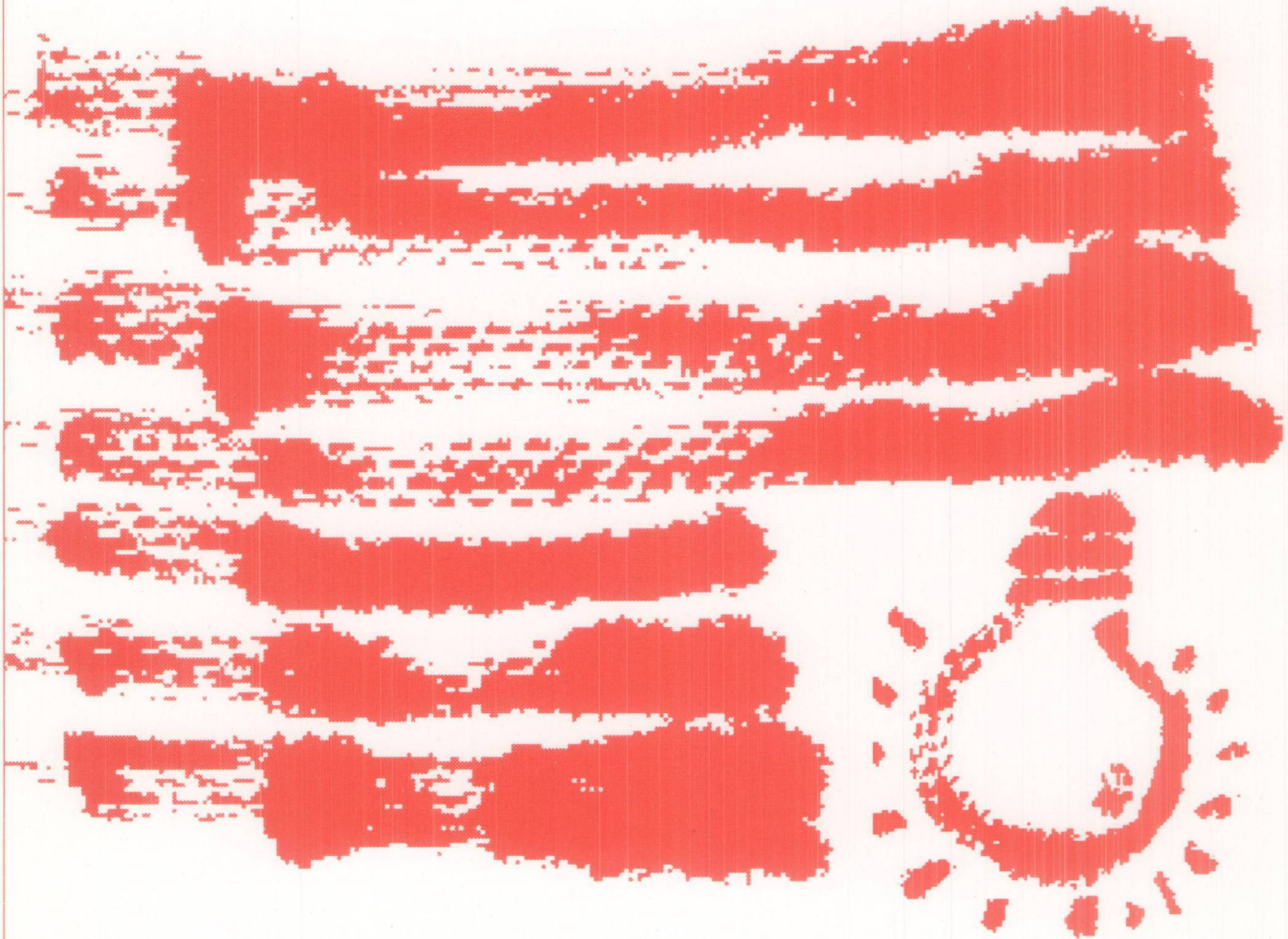
24. **History:** Production and net imports of natural gas compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Annual, Volume 2,* DOE/EIA-0131/2, Table 2 for historical series; for recent production data, *Natural Gas Monthly,* DOE/EIA-0130. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

25. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Natural Gas Annual, Volume 2,* DOE/EIA-0131, Table 3 for historical series; for recent values, Energy Information Administration, *Natural Gas Monthly,* DOE/EIA-0130. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

26. **History:** Compiled from quarterly data used in publication of Energy Information Administration, *Quarterly Coal Report,* DOE/EIA-0121, Table 45. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

27. **History:** Compiled from quarterly data used in publication of Energy Information Administration, *Quarterly Coal Report,* DOE/EIA-0121, Table 1. **Projections:** Fourth quarter 1994 STIFS database, case "BBB"; and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

28. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Electric Power Monthly ,* DOE/EIA-0226, Table 51. **Projections:** Fourth quarter 1994 STIFS database, case "BBB."

29. **History:** Compiled from monthly data used in publication of Energy Information Administration, *Electric Power Monthly ,* DOE/EIA-0226, Table 3 and Form EIA-759. **Projections:** Fourth quarter 1994 STIFS database, case "BBB"; and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels for hydroelectric and nuclear power forecasts.

30. **History:** 1992: Energy Information Administration, *Annual Energy Review 1993,* DOE/EIA-0384(93), Table 10.1; 1993 (preliminary estimates): Fourth quarter 1994 STIFS database and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. **Projections:** Fourth quarter 1994 STIFS database and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

31. **History:** 1992: Energy Information Administration, *Annual Energy Review 1993,* DOE/EIA-0384(93), Table 10.1; 1993 (preliminary estimates): Fourth quarter 1994 STIFS database and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels. **Projections:** Fourth quarter 1994 STIFS database and Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels.

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