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QUARTERLY PROJECTIONS

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1992

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Office of Energy Markets and End Use
Energy Information Administration

Fourth Quarter 1992

Quarterly Projections

Short-Term Energy Outlook

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

	Price Case ^a	Year				Annual Percentage Change		
		1990	1991	1992	1993	1990-1991	1991-1992	1992-1993
Real Gross Domestic Product (GDP)								
(billion 1987 dollars)	Mid	4877	4821	4907	5043	-1.1	1.8	2.8
Imported Crude Oil Price								
(nominal dollars per barrel)	Low			17.86	17.00		-4.4	-4.8
	Mid	21.75	18.69	18.65	20.00	-14.1	-0.2	7.2
	High			19.15	22.00		2.5	14.9
Petroleum Supply								
Crude Oil Production ^b	Low			7.14	6.77		-3.8	-5.2
(million barrels per day)	Mid	7.36	7.42	7.18	7.00	0.8	-3.2	-2.5
	High			7.21	7.18		-2.8	-0.4
Total Petroleum Net Imports (including SPR)	Low			7.06	7.89		6.6	11.8
(million barrels per day)	Mid	7.16	6.62	7.00	7.55	-7.5	5.7	7.9
	High			6.95	7.30		5.0	5.0
Energy Demand								
Petroleum	Low			17.06	17.45		2.1	2.3
(million barrels per day)	Mid	16.99	16.71	17.04	17.32	-1.6	2.0	1.6
	High			17.03	17.24		1.9	1.2
Natural Gas	Low			19.72	20.32		2.5	3.0
(trillion cubic feet)	Mid	18.71	19.24	19.79	20.67	2.8	2.9	4.4
	High			19.82	20.84		3.0	5.1
Coal								
(million short tons)	Mid	895	888	894	918	-0.8	0.7	2.7
Electricity ^c								
(billion kilowatthours)	Mid	2713	2759	2763	2852	1.7	0.1	3.2
Gross Energy ^d								
(quadrillion Btu)	Mid	81.3	81.6	82.7	85.1	0.4	1.3	2.9
Gross Energy Demand per Dollar of GDP								
(thousand Btu per 1987 dollar)	Mid	16.67	16.94	16.86	16.88	1.6	-0.5	0.1

^aRefers 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.

^bIncludes lease condensate.

^cTotal 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.

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

SPR: Strategic Petroleum Reserve

Notes: Minor discrepancies with other published EIA historical data are due to independent rounding. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by the following simulations of the Short-Term Integrated Forecasting System: C102092BBB14:56 for the mid oil price case, C101992PLB16:51 for the low oil price case, and C101992WHB16:35 for the high oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/07); *Petroleum Supply Monthly*, DOE/EIA-0190(92/05); *Petroleum Supply Annual 1991*, DOE/EIA-0340(91)/1; *Natural Gas Monthly*, DOE/EIA-0130(92/07); *Electric Power Monthly*, DOE/EIA-0226(92/07); and *Quarterly Coal Report*, DOE/EIA-0121(92/1Q). Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0892.

The Organization for Economic Cooperation and Development includes the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Japan, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States.

Normal is defined as the average degree-days between 1951 and 1980 for a given period, as defined by the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

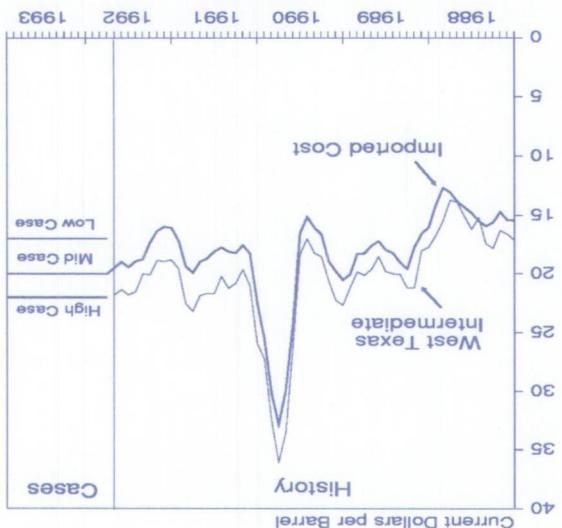
Denmark, Finland, France, Germany, Greece, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States to the above petroleum demand in the United States to the above "Petroleum Sensitivities" summarizes the sensitivity of production over the last 15 years for heating and cooling degree-days. The section "Petroleum Demand and deviations over the last 15 years for heating and cooling degree-days" represents one-half of the greatest quarterly representation cases are above and below normal weather cases are rate over the forecast period. The below the mid-case rate over the forecast period. The product of roughly 1.6 percentage points above and represented by a variation in growth in gross domestic product in the high and low macroeconomic cases is weather cases are also considered. The range of growth energy forecasts, but alternative macroeconomic and assumptions are used to generate the mid-price U.S. significance amplify the uncertainty of energy forecasts. The mid-macroeconomic case and normal weather uncertainty in macroeconomic growth and whether can is expected in 1993, as weather is assumed normal.

residential sectors. Thus, greatly increased energy use

Note: Imported prices are defined as the cost of imported crude oil to U.S. refiners.

Sources: History; Energy Information Administration, Monthly Energy Review (September 1992); and Oil and Gas Journal/Energy Database. Cases: Table 5.

Figure 1. U.S. Crude Oil Prices



World Oil Prices

The world oil price is defined as the refiner acquisition cost of imported crude oil, or the weighted average of the cost of imported crude oil, or the weighted average of other major energy consuming countries. The following discussion reviews the key input assumptions.

Introduction

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Figure 1. Deaths per 100,000 people

that the older person is associated with an increased risk of death. In addition, the association between age and death is not limited to the elderly, as the young also experience an increased risk of death with increasing age.

The question therefore arises, what is the mechanism by which age influences the risk of death? One possibility is that the increased risk of death in the elderly is due to a higher prevalence of chronic diseases, such as heart disease, stroke, and cancer. These diseases can lead to functional decline and increased dependency on others, which may contribute to the increased risk of death. Another possibility is that the increased risk of death in the elderly is due to a combination of biological factors, such as genetic predisposition, environmental exposures, and lifestyle choices. For example, smoking, alcohol use, and poor diet have all been shown to increase the risk of death in the elderly. Additionally, the physical activity levels of the elderly may be lower than those of younger adults, which can contribute to the increased risk of death.

It is important to note that while age is a risk factor for death, it is not the only factor. Other factors, such as gender, race, ethnicity, socioeconomic status, and health behaviors, also play a role in determining the risk of death. For example, men tend to have a higher risk of death than women, and African Americans tend to have a higher risk of death than white Americans.

Overall, the relationship between age and death is complex and multifactorial. While age is a risk factor for death, it is not the only factor, and other factors must be considered when trying to understand the causes of death.

It is important to remember that death is a natural part of life.

Age and HO photo

Photochemical reactions with an electron acceptor molecule (such as oxygen or nitrate) to reduce a hydroxyl radical to an electron donor molecule (such as water or nitrite) are called photochemical reactions. The HO radical is formed by the HO radical to the HO radical intermediate via reaction with HO radical to form HO radical and HO radical.

Photochemical reactions with an electron acceptor molecule (such as oxygen or nitrate) to reduce a hydroxyl radical to an electron donor molecule (such as water or nitrite) are called photochemical reactions.

Termination pathways of photochemical

photochemical reactions. In this paper, photochemical reactions involving photochemical reduction of hydroxyl radicals (HO) to the formation of electron acceptor molecules (such as oxygen or nitrate) are studied. The reaction mechanism involves the formation of an electron-rich intermediate (such as HO radical) and its subsequent reduction by an electron acceptor molecule (such as oxygen or nitrate). The reaction mechanism involves the formation of an electron-rich intermediate (such as HO radical) and its subsequent reduction by an electron acceptor molecule (such as oxygen or nitrate).

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The "call" on crude oil production from OPEC is equal to the projected requirement for total oil supply from OPEC of about 27.2 million barrels per day (Table 4) less an assumed rate of production of non-crude oil liquids (including lease condensates, natural gas plant liquids, and refinery gains) of about 2.1 million barrels per day.

Average increase of about 60,000 barrels per day in 1992. (Table 2). Gasoline demand is expected to show an although overall demand growth should not accelerate tend to increase demand growth in 1993 for some fuels, the mild winter and summer temperatures in 1992, will be assumed for the mid-price case (Table 7). The expected for the mid-price case (Table 7). The of about 300,000 barrels per day in 1992 and 1993 are far in 1992, and the 1993 outlook is similar. Increases U.S. petroleum demand has exhibited modest growth so

Non-OECD demand is expected to decrease by 90,000 barrels per day in 1992, to 28.5 million barrels per day, and then increase by 460,000 barrels per day in 1993.

Region	1991	1992	1993
China	2.82	2.63	2.46
Latin America	5.46	5.33	5.23
Asia	6.95	6.34	5.71
Middle East	6.87	3.52	3.52
Africa	2.35	2.17	2.17
Total	21.45	20.24	19.08

Demand in non-OECD regions other than the former Soviet Union and Eastern Europe is expected to increase by about 1.2 million barrels per day in both 1992 and 1993, with the largest increases occurring in Asia, China, and the Middle East. Petroleum demand in 1992 and 1993, (in million barrels per day) for other non-OECD regions is as follows:

In Europe, in 1993, OECD demand is expected to increase by 590,000 barrels per day, if OECD economic growth in 1992 is expected to occur in the United States and More than 85 percent of the growth in OECD demand economic growth will be 1.7 percent in 1992 (Table 2). This estimate is based on the assumption that OECD economies. In 1992, OECD demand for petroleum is expected to average 38.5 million barrels per day, up 500,000 barrels per day from the 1991 level. This transition from centrally planned economies to market

Outlook for Petroleum

Petroleum demand is expected to increase in most regions of the world in 1992 and 1993. The former Soviet Union and the European countries outside the Organization for Economic Cooperation and Development (OECD) are the major exceptions, where economic activity as these nations struggle to make the decisions in demand are expected due to declining

to be followed by a larger increase of 1.1 million barrels in 1992, to 67.0 million barrels per day. This is expected to increase by 410,000 barrels per day in mid-price case, world demand for petroleum products based on supply and demand patterns that reflect the

Demand for petroleum, as discussed in this report, is synonymous with "petroleum product supplied," which is defined as the sum of petroleum production (including refinery gain), imports minus exports, and changes in primary stocks.

Demand

earlier levels or an oil stock drawdown that is faster than assumed. The former Soviet Union that are significantly above year on OPEC crude oil production are oil exports from the Other possible causes for a lower than projected "call" normal or economic growth is weaker than expected. than projected because there is lower than short of the expected level if oil demand is lower than projected for crude oil production from OPEC could earlier levels or an oil stock drawdown that is faster than assumed. The former Soviet Union that are significantly above year on OPEC crude oil production are oil exports from the Other possible causes for a lower than expected. Demand for petroleum other than oil products is expected to increase by 2.9 percent. In 1992, it is expected to increase by 590,000 barrels per day, if OECD economic growth in 1992 is expected to occur in the United States and More than 85 percent of the growth in OECD demand economic growth will be 1.7 percent in 1992. This estimate is based on the assumption that OECD economies are expected to average 38.5 million barrels per day, up 500,000 barrels per day from the 1991 level. This transition from centrally planned economies to market

Gasoline demand growth in 1993 is uncertain but is not likely to rise very quickly since highway travel growth is expected to taper off slightly, while modest increases in automobile efficiency continue (Tables 2 and 7 and Figure 2). Growth in distillate fuel oil demand is projected to be about 140,000 barrels per day in 1993 (Table 7). Heating oil markets should get a boost from assumed normal winter temperatures, and increased truck traffic is expected to push diesel fuel demand steadily higher. Despite rising natural gas prices, however, the mid-price case outlook for growth in residual fuel oil demand remains weak and is up by less than 1 percent in 1993, after declining by 4 percent in 1992. Demand for other petroleum products showed strong growth through the summer of this year.

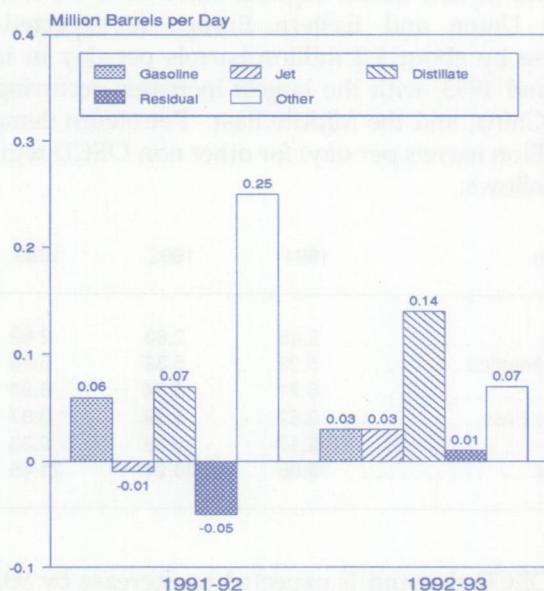


Figure 2. Annual Change in U.S. Petroleum Demand by Fuel

Source: Table 7.

Growth is projected to continue through 1993 but at a slower pace. A stronger residential propane market caused by an assumed return to normal winter temperatures should keep liquefied petroleum gas (LPG) demand relatively high, while demand for other oils will depend heavily on the nature of the economic recovery, particularly in construction and manufacturing.

In the short term, deviations from normal weather patterns can account for much of the forecasting error for petroleum demand. However, the likelihood of particular deviations occurring diminishes as more and more severe conditions are considered. For example, the probability of the first quarter being 10 percent warmer than normal is 14 percent; but the probability of it being 15 percent warmer than normal is only 4 percent.⁴ The weather induced change in petroleum demand is more than 0.6 million barrels per day (3.7 percent) in the context of a 15-percent deviation in heating degree-days from normal. Variations in economic growth also impact petroleum projections. If economic growth followed the low growth path shown in Table 2, petroleum demand in 1993 would be about 264,000 barrels per day below the mid-price case average.⁵ When the world oil price is assumed to range from \$17 to \$22 per barrel over the forecast period, the corresponding demand variation is projected to be about 205,000 barrels per day.⁶

Supply

World oil production is expected to increase by about 200,000 barrels per day in 1992 to 66.7 million barrels per day (Table 4). This minor change in world oil supply, however, masks significant, offsetting swings in production in major producing regions. A large production decline in the former Soviet Union (1.3 million barrels per day this year) is expected to be largely offset by a significant production increase in OPEC. Oil supply from the OECD countries will be almost unchanged in 1992, as a production increase from the North Sea offsets production declines from the United States and the other OECD region.

⁴This calculation is based on 15 years of heating degree-day data (first-quarter months) using the assumption that the data are normally distributed. See Appendix of this report for details on the weather calculations.

⁵Based on internal calculations from the Short-Term Integrated Forecasting System model. The 264,000 barrels per day corresponds to about one-half the demand range for 1993 shown in Table 9 under "Economic Activity." The high growth case would result in roughly a similar difference from the base case in 1993 in the upward direction. The 540,000 barrels per day in Table 9 for 1993 "Economic Activity" sensitivity is the sum of the differences from the mid-price case for the low and high economic growth cases. Detailed results for these high and low growth cases are not published in this report but are available on computer files of the Energy Markets and Contingency Information Division.

⁶Based on calculations from the Short-Term Integrated Forecasting System model. In this case, prices of coal and natural gas are assumed to remain constant.

- In the former Soviet Union, the production and consumption of oil are expected to decline. Export volumes will be determined by the relative decline rates of production and consumption and by the competition needed for hard currency in the emerging market economies of the new republics. Oil prices for oil products in the Russian Republic are finally decentralised and allowed to reach world market levels. Oil production is more dependent on the amount of foreign investment in the oil sector. In the short-term, little can be done to arrest the decline in oil production. Revenues from the vast quantities of oil held elsewhere for the vast quantity to restore current oil imports are necessary to restore current oil imports and to develop new resources.
- Two OPEC countries, Kuwait and Iraq, are in the process of restoring their pre-war production capacity and export facilities. Kuwait is expected to increase production by about 400,000 barrels per day in 1992, and remain unchanged in 1993 (Figure 3). Capacity restoration in Kuwait and capacity expected to offset increases in Saudi Arabia and Iran are expected additions in Saudi Arabia and Iran are expected to more than offset increases in actual OPEC
- Excess production capacity. Excess capacity is uncertainities could influence oil prices: Two other factors affect the extent to which these

near term, it necessary, while exports from Kuwait OPEC members to increase their production in the OPEC production depends on the willingness of other OPEC members to increase their production against OPEC exports remains in effect. Aggragate OPEC long as the United Nations embargo against Israel is restored. Iraqi production and exports as capacity is to increase production and exports as capacity is capacity and export facilities. Kuwait is expected to remain below normal.

U.S. total petroleum net imports are expected to increase between 1992 and 1993, if demand increases and U.S. oil production declines. For the mid-price and U.S. oil price case in 1993, total net imports are expected to use a since winter (oxygenated) gasoline is expected to some what hand, total net imports may be restrained by 550,000 barrels per day (7.9 percent). On the other case, total net imports are projected to increase by 500,000 barrels per day (7.9 percent). Demand for petroleum could variabilty is weather. The most important factor affecting oil imports past. The higher proportion of midgrade product (because of domestic oxygenate production capability) than in the high since winter (oxygenated) gasoline is expected to use a hand, total net imports may be restrained by 550,000 barrels per day (7.9 percent).

The potential sensitivities of domestic oil production to price variations are depicted in Tables 6 and 8. Domestic oil production may range from 180,000 barrels per day above to 230,000 barrels per day below the mid-price case in 1993. Table 10 provides a disaggregation of the range of oil production expected for the fourth quarter of 1993 between the high and low price cases. The two main factors affecting this range are price uncertainty and uncertainties relating to the timing of expected maintenance and development are price cases. The two main factors affecting this range for the fourth quarter of 1993 between the high and low price cases. Although the rig count should improve in 1993, total wells drilled are not expected to reach 1991 levels in September 1992, down 7 percent from the year-earlier the Baker-Hughes rig count at 717 at the end of the Bakker-Hughes rig count in 1993 in a slump, with mid-price case. Drilling activity is still in 1993 in the expected to be 7.0 million barrels per day in 1993 in the however, and total U.S. petroleum production is estimates for the lower-48 States in the third quarter of 1992. These effects were generally short-lived, 1992. Although the rig count should improve in 1993 in the Bakker-Hughes rig count in 1993 is somewhat less pronounced than last year. The effects of the decline between 1992 and 1993 is somewhat less crude oil prices steady at about \$20 per barrel. crude oil prices remained steady at about \$20 per barrel, by an annual average rate of 180,000 barrels per day in 1993 under the mid-price case (Table 7), if imported

Domestic oil production is generally expected to decline from the former Soviet Union and oil production from oil supply, for example, are centred on oil exports to oil companies. Each of these factors is subject to other factors such as expectations of market participants. Each of these factors is subject to other factors such as supply, demand, and

World Oil Prices

swings by several hundred thousand barrels per day during the coldest winter months depending on the severity of the weather.

Soviet Union will more than offset the former million barrels per day in production from the former million barrels per day next year. Non-OPEC production is expected per day by 0.7 million barrels per day. A decline of 0.9 to fall by 0.7 million barrels per day. A decline of 0.9 million barrels per day in production from the former Soviet Union will increase from the North Sea will fall well production from other non-OPEC countries. Likewise, a production increase from the North Sea will fall well short of production decreases from the United States and the other OPEC region. As a result, the market share of OPEC will rise, as its production increases by 1.6 million barrels per day.

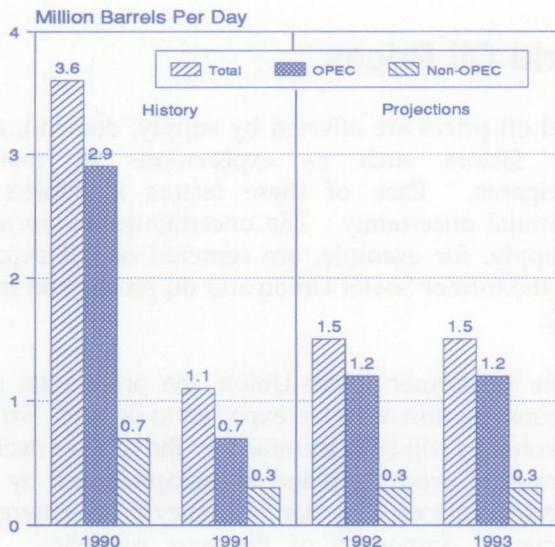


Figure 3. World Excess Oil Production Capacity

Note: Excludes any excess capacity from Iraq.

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

production in 1992, but capacity increases from these countries may fall short of OPEC production increases in 1993. Kuwait (including its share of the Neutral Zone) is expected to have the capacity to produce almost 2.0 million barrels per day by the end of 1993,⁷ but Iraqi capacity is assumed to continue to be constrained by the United Nations sanctions.

- **Stocks.** At the end of the third quarter of 1992, the market economies are expected to have enough stocks readily available to meet petroleum demand for 29 days (Figure 4), based on anticipated demand levels, 2 days less than at the same time in 1991. This represents usable commercial stocks only, and excludes strategic government stocks of about 855 million barrels and the minimum inventory levels that must be maintained for normal operations of about 3.1 billion barrels.⁸

The winter of 1992-1993 could see a combination of continued low levels of world excess production

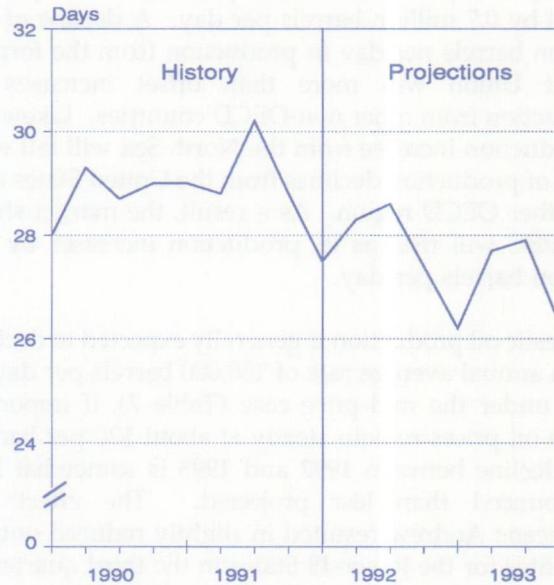


Figure 4. Days Supply of Market Economies Commercial Petroleum Stocks

Note: Represents usable stocks; excludes strategic stocks and minimum operating inventory.

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

capacity (outside of Iraq) and a lower level of readily available stocks than in the last 2 winters. This combination could place upward pressure on world oil prices this winter.

The key uncertainties affecting oil demand over the forecast period are the magnitude of economic growth, especially in the United States, Japan, and Western Europe, and the severity of winter weather. Steady economic recovery is expected in OECD countries. In the short term, variations in weather could have a greater effect on energy demand than variations in economic activity.

Because future price developments remain uncertain, three world oil price cases are developed (Figure 1 and Table 5) for analysis. These cases are used to derive a mid-price case projection and alternative projections for domestic petroleum supply and demand. The three world oil price cases are meant to represent the range

⁷Based on assumptions from the Energy Markets and Contingency Information Division.

⁸Based on assumptions from the Energy Markets and Contingency Information Division.

The high-price case assumes that oil production from Kuwait and oil exports from the former Soviet Union will increase by an average of 220,000 barrels per day in 1992, to 1.9 million barrels per day in 1993. In the mid-price case, the world oil price is about \$18 per barrel in 1992 and \$17 per barrel in 1993. In the high-price case, the price is \$18.65 per barrel in 1992 and \$20 per barrel in 1993. In the low-price case, the price is \$17 per barrel in 1992 and to \$22 per barrel in 1993. Net oil exports from the former Soviet Union will decrease by 1.9 million barrels per day in 1992, to 190,000 barrels per day in 1993, as production declines continue to exceed reductions in oil consumption (Table 4). In Saudi Arabia, limited exports for humanitarian purposes.

In Saudi Arabia, limited exports for humanitarian purposes will be almost 2.0 million barrels per day in 1992, from about 1.4 million barrels per day in the first quarter of 1992 to about 1.14 million barrels per day in the fourth quarter. By the end of 1993, production is expected to be almost 2.0 million barrels per day. The OPEC member countries will carry out the immediate to resume totally unrestricted exports and that other OPEC members do not restrain their production to accommodate these exports. Other supply factors adding to the downward pressure on prices include higher production from Kuwait and higher exports from the former Soviet Union than in the mid-price case. Demand could be lower due to slower higher exports from the former Soviet Union than in the mid-price case.

Based on assumptions from the Energy Markets and Contingency Information Division,¹² energy information administration's short-term energy outlook for October 1, 1992, is between 21 and 33 million barrels. An estimate of target level for October 1, 1992, is stocks of methyl tertiary butyl ether were 23.1 million barrels. An oxygenated gasoline "gasoline," Page 3, DOE/EIA-2M02(92), Plate's Oilgram Price Report, New York, NY; October 21, 1992. Spot market prices for oxygenated gasoline on the U.S. Gulf Coast were about 3.4 cents per gallon higher than non-oxygenated gasoline.

"Energy Information Administration, Monthly Oxygenate Report," Page 33, DOE/EIA-0208(92-38), (Washington, DC: 1992). As of August 31, 1992, U.S. stocks of methyl tertiary butyl ether were 23.1 million barrels. An oxygenate gasoline price equal to that of 1991 (Table 5). In 1993, higher crude oil prices, the continuing cost pass-through associated with the Clean Air Act, and additional expected growth in State and local taxes should add 6 cents per gallon to the annual average price.

The mid-price case results in a 1992 average annual content requirement.¹² During the last quarter of 1993 due to lower sulfur expected to increase by an additional 5 cents per gallon through February. Diesel fuel prices are also by an average of 1 to 2 cents per gallon from November per gallon in the affected regions, raising national prices by implementation of these rules is about 3 to 5 cents by implement nation of these rules is about 3 to 5 cents per gallon in the winter approaches, the supply of oxygenates appears to be adequate to meet the target of this year. As the winter approaches, the supply of requirements for oxygenate content by November of and transporting gasoline designed to meet Federal requirements during the winter of 1992-1993 due to higher supply costs associated with manufacturing, storing, increasing prices during the winter of 1992-1993 due to be subject to additional

U.S. Petroleum Product Prices

The high-price case assumes that oil production from Kuwait and oil exports from the former Soviet Union will increase by an average of 220,000 barrels per day in 1992, to 1.9 million barrels per day in 1993. In the mid-price case, the world oil price is about \$18 per barrel in 1992 and \$17 per barrel in 1993. In the high-price case, the price is \$18.65 per barrel in 1992 and \$20 per barrel in 1993. In the low-price case, the price is \$17 per barrel in 1992 and to \$22 per barrel in 1993. Net oil exports from the former Soviet Union will decrease by 1.9 million barrels per day in 1992, to 190,000 barrels per day in 1993, as production declines continue to exceed reductions in oil consumption (Table 4). In Saudi Arabia, limited exports for humanitarian purposes.

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The mid-price case is based on the following assumptions:

Over which prices could vary during the forecast period. In the low-price case, the world oil price is about \$18 per barrel in 1992 and \$17 per barrel in 1993. In the mid-price case, the price is \$18.65 per barrel in 1992 and \$20 per barrel in 1993. In the high-price case, the price is \$17 per barrel in 1992 and to \$22 per barrel in 1993.

In the mid-price case, the price is \$18.65 per barrel in 1992 and \$20 per barrel in 1993. In the high-price case, the price is about \$18 per barrel in 1992 and \$17 per barrel in 1993. In the low-price case, the price is \$17 per barrel in 1992 and to \$22 per barrel in 1993.

The world oil price increases to about \$19 per barrel in 1992 and \$20 per barrel in 1993. In the high-price case, the price is \$18.65 per barrel in 1992 and \$20 per barrel in 1993. In the mid-price case, the price is \$18 per barrel in 1992 and \$17 per barrel in 1993. In the low-price case, the price is \$17 per barrel in 1992 and to \$22 per barrel in 1993.

Residential heating oil prices have recovered from the effects of abnormally warm weather during the first quarter (Table 5). Weak prices from excess supplies during the winter were replaced by unseasonably strong prices during the spring, due to cooler-than-normal weather and rising crude oil prices. Higher world oil prices and assumed normal winter weather in 1993 should lead to an increase of 5 cents per gallon in 1993.

Residual fuel oil prices are also down in 1992 due to the warm first-quarter weather followed by a mild summer, which resulted in low electric utility use of this fuel. Despite the prospect of higher natural gas prices and somewhat stronger winter demand, if weather is normal in 1993, residual fuel price increases are expected to rise only enough to keep refiner margins about even with the 1992 average because of the underlying weakness of the residual fuel market. Massive fuel switching in a severe winter scenario could alter this view.

U.S. Petroleum Demand

Motor Gasoline

Reversing a 3-year decline, motor gasoline demand is projected to increase by 0.8 percent in 1992 and by a further 0.4 percent in 1993 (Table 7). Gasoline demand is expected to rise in the context of a steady economic recovery and a moderation in the rate of growth in fleet-wide fuel efficiency relative to previous years.

In 1992 and 1993, vehicle-miles traveled are projected to grow by 2.3 and 2.1 percent, respectively, more than double the 1991 growth rate (Table 3 and Figure 5). Part of the apparent strength in 1992 stems from low levels of highway travel in the first quarter of 1991 which resulted from high gasoline prices during the Persian Gulf conflict. The slight slowdown in travel growth in 1993 partly reflects the moderation in projected real disposable income growth from that of the previous year, and the fact that real (adjusted for inflation) gasoline prices are expected to rise next year, in contrast to being down by 3 percent in 1992.

Fleet fuel efficiency in 1992 is projected to grow by 1.4 percent, the smallest increase in 5 years, and by 1.7 percent in 1993 (Table 3). The implementation of the new oxygenate requirements during the fourth quarter are expected to dampen apparent fuel efficiency growth for 1992. The moderation in fuel efficiency growth throughout the forecast (from the 2.9-percent average of

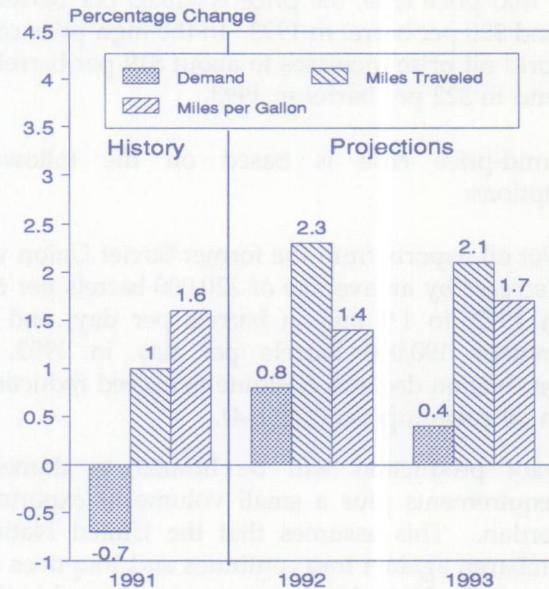


Figure 5. Annual Change in U.S. Motor Gasoline Market Indicators

Sources: History: Energy Information Administration, *Petroleum Supply Monthly* (September 1992); Federal Highway Administration, *Traffic Volume Trends*. Projections: Tables 3 and 7.

the 1986 to 1991 period) reflects the lack of improvement in average new-car fuel efficiency and the shrinking proportion of inefficient cars among the vehicles being scrapped.

Jet Fuel

Economic weakness continued to depress jet fuel markets throughout the first half of 1992, when demand declined by 3.1 percent from the same period in 1991 (Table 7 and Figure 6). Air travel demand began recovering in the third quarter of 1992 in response to economic recovery and air fare promotions.

Jet fuel demand for 1992 as a whole is projected to decline slightly relative to 1991. Despite the competitive behavior of air carriers since mid-year, demand for the second half of the year is projected to increase by only 0.7 percent from the depressed levels of 1991, failing to offset the steep decline during the first half of 1992. In 1993, demand is projected to increase by 2.1 percent, reflecting growth in available ton-miles.

¹³Energy Information Administration, Monthly Energy Review, DOE/EIA-0035(92/09), (Washington, DC: September 1992).

Demand for other petroleum products is expected to grow by 6.3 percent in 1992 (Table 7). Higher-than-normal weather assumptions during the four-year account for much of the robust demand growth. This rapid growth in the "other oils" is not expected to continue, and diesel fuel demand is expected to grow steadily along with industrial activity through the year.

Other Petroleum Products

The long-term decline in residual fuel oil demand is expected to slow in 1992 with a possible recovery in 1993 caused by higher electric utility demand. Residual fuel oil demand, such as in 1986 when oil prices collapsed,¹³ due to normal weather assumptions and pick up next year, electricity demand is expected to remain weak and other sectors is expected to remain weak despite the implied increase in electric utility recovery. Despite the implied increase in economic due to normal weather assumptions and pick up recovery, such as in 1986 when oil prices collapsed,¹³ Next year, electricity demand is expected to remain weak and other sectors is expected to remain weak despite the implied increase in electric utility recovery. Despite the implied increase in economic

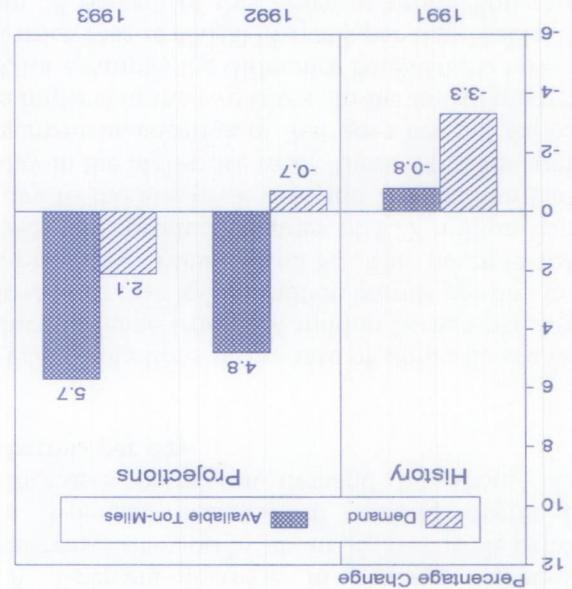
recovery, such as in 1986 when oil prices collapsed,¹³ U.S. demand for distillate fuel oil appears to be on track for a steady recovery. Low levels of demand in 1990 and 1991 were brought about by repeated mild heating seasons and a sluggish U.S. economy. The first half of 1992 had an average increase of about 70,000 barrels per day (2.3 percent) in distillate demand compared to year-earlier levels (Table 7). A slightly larger increase is expected for the second half of this year, particularly if heating demand returns to normal by October 1992. Assuming normal winter and spring growth in heating demand to be the second half of this year, particularly if heating demand returns to normal by October 1992. Assuming normal winter and spring growth in heating demand to be the second half of this year, particularly if heating demand returns to normal by October 1992. Diesel fuel demand is expected to rise about 140,000 barrels per day (4.7 percent) in 1993.

¹⁴Distillate demand is expected to rise about 4.6 percent next year,

Distillate Fuel Oil

Sources: History: Federal Aviation Administration, Projections: Tables 3 and 7.

Figure 6. Annual Change in U.S. Jet Fuel Market Indicators



Particularly cold weather (10 to 20 percent higher-than-normal heating degree-days) during the upcoming winter could pose some challenges to the domestic fuel oil industry, particularly if the availability of substitute fuels (mainly natural gas) is limited. The supply picture for natural gas is expected to be much tighter than it has been in the past, and this would be of particular concern if very cold winter temperatures materialize and persist. A look at the implications of severe cold weather conditions on fuel supplies is provided in "1992-1993 U.S. Winter Fuels Assessment" on page 17.

	Million Barrels	Percent
Transportation	2.8	9.4
Residential/Commercial	0.05	0.06
Other	0.03	0.03
Total	5.1	5.1

Petroleum Demand and Production Sensitivities

The petroleum demand and supply outlook for the mid-price case is based on normal temperatures and a particular set of macroeconomic assumptions. In order to enhance the usefulness of the mid-case forecast, Tables 9 and 10 provide a range of possible outcomes for petroleum demand and supply when alternative macroeconomic, price, and weather assumptions are used.

The petroleum price sensitivity assumes that non-petroleum 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. (See Appendix for more details). Average petroleum sensitivity factors for this forecast are summarized below:¹⁴

- A 1-percent increase in real GDP raises petroleum demand by about 155,000 barrels per day.
- A \$1-per-barrel increase in crude oil prices, assuming no price response from non-petroleum energy sources, reduces demand by about 41,000 barrels per day.

- A \$1-per-barrel increase in crude oil prices boosts domestic oil supply (crude oil and natural gas liquids production) by 79,000 barrels per day.
- A 1-percent increase in heating degree-days increases demand by about 36,000 barrels per day; a 1-percent increase in cooling degree-days increases petroleum demand by about 11,000 barrels per day.

For 1992, projections of the rate of domestic crude oil production range from 7.14 million barrels per day in the low-price case to 7.21 million barrels per day in the high-price case (Tables 6 and 8). This range increases in 1993, with production rates of 6.77 million barrels per day in the low-price case and 7.18 million barrels per day in the high-price case. These estimates contain an element of uncertainty that goes beyond expected price impacts in the two cases. In the fourth quarter of 1993, for example, the difference between the low- and high-price case is 450,000 barrels per day (Table 10).¹⁵ About 38 percent of this range of production can be attributed to uncertainties in the preliminary estimates of current production levels and the timing of expected events. About 62 percent of this range is attributed to the impact of prices on drilling rates and well maintenance.

¹⁴The oil demand sensitivity factors were derived from internal calculations of the Demand Models of the Short-Term Integrated Forecasting System. The oil supply sensitivity was derived implicitly from Tables 6 and 8 and includes uncertainty components not strictly related to price variation. The latter sensitivity is averaged over the last quarter of 1992 and the four quarters of 1993.

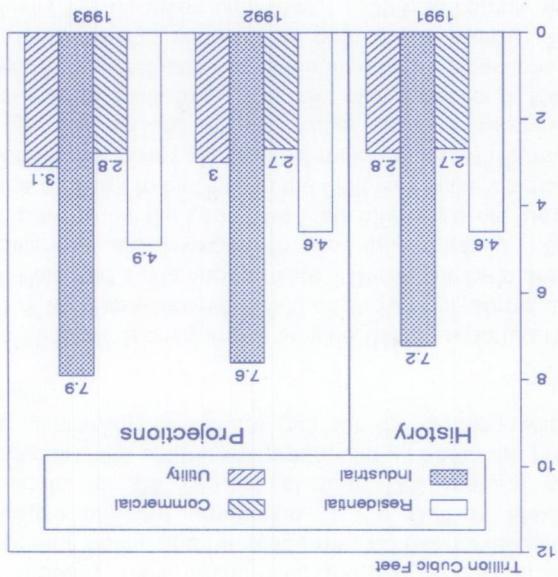
¹⁵Of this total, the lower 48 States accounted for 340,000 barrels of oil per day. The uncertainty of 120,000 barrels per day for the lower 48 States contains 90,000 barrels of oil per day that results from varying the low and high price case estimates by an amount equal to 1 percent of the 1992 second quarter oil rate and reducing that amount starting with the third quarter of 1992 through the end of 1993. The remaining 30,000 barrels per day is additional oil production expected from the Point Arguello field in the Pacific Federal Outer Continental Shelf. The larger portion of the difference (220,000 barrels per day) is attributable to the price impact where more drilling is expected at higher prices, as well as more frequent well maintenance and reduction of well abandonments.

¹⁶Energy Information Administration, Form EIA-867, "Annual Nonutility Power Producer Report."

increase from the 1992 level, in the mid-price case. of dry natural gas by 550 billion cubic feet, a 3.0-percent wellhead price are expected to boost production levels period. In 1993, rising gas consumption and higher expected to remain that way throughout the forecast have been lower in 1992 than in recent years and are page 14). Underground working gas storage levels (See "Effect of Hurricane Andrew on Natural Gas" on production Andrew's temporary disruption of gas Hurricane Andrew and transport systems in the Gulf region. due to low wellhead prices causing some production to be shut in, and again in September and October due to slowdowns in gas production occurred in March 1992, increase of 1.7 percent over 1991 (Table 11). Temporarily growth of about 300 billion cubic feet for all of 1992, an U.S. production of dry natural gas is expected to show

increase from the 1992 level, in the mid-price case, and commercial demand by 6.2 and 2.9 percent, weather and faster economic recovery boost residential and mild temperatures in the first quarter, but normal residential and commercial sectors in 1992 has been due to the 1991 level (Table 13). Slower growth in the expected to recover, although nuclear should return both hydroelectric and nuclear power generation are resulted in higher gas demand by utilities. In 1993, generation as a result of maintenance in 1992 has both hydroelectric and reduced nuclear power generation drought in several regions, and result of maintenance in 1992 has been rising in 1993, growth is expected to average 5.0 percent this year and 5.1 percent in 1993. Diminished hydropower generation as a result of utilities has been rising in 1992. Growth is expected to importane. Natural gas consumption at electric importance. Natural gas supply is growing in relative component of electricity supply because gas is the fuel of choice in nonutility power generation, and this share is expected to rise because gas is the fuel of projected to total industrial demand for gas. This 20 percent of total industrial gas accounted for almost power producers for natural gas demand by nonutility (Table 11 and Figure 7). In 1990, demand by nonutility Gas consumption in the industrial sector is projected to rise by 4.3 percent in 1992 and by 4.2 percent in 1993 (Source: History: Energy Information Administration, Natural Gas Monthly (September 1992). Projections: Table 11.

Figure 7. Natural Gas Consumption by Sector



Natural Gas

Demand for natural gas has grown steadily this year, and growth is expected to accelerate in 1993. Total consumption of natural gas in 1993, to 20.67 trillion cubic feet, is projected for 4.4 percent, or 19.79 trillion cubic feet, in the mid-price case (Table 11). Some what higher growth of 4.4 percent, or 19.79 average 2.9 percent above the 1991 level, or 19.79 consumption of natural gas in 1993. Total and residential sectors in the industrial and electric utility sectors. In demand in the industrial sector grew in 1992 are rising 1993, economic growth and residential and assumed return of normal weather contribute to the commercial sector demands associated with the expected increase in demand. Hurricane Andrew's effect on natural gas production in the Gulf of Mexico, although severe, was only temporary and is not projected to cause any supply shortage this winter, as lost production was either restored or made up by other onshore facilities.

Outlook for Other Major Sources

Effect of Hurricane Andrew on Natural Gas

In anticipation of the arrival of Hurricane Andrew, operators of oil and gas wells in the Gulf Coast closed down production on Monday morning, August 24, 1992. By Tuesday, most offshore oil and gas production had been shut down, and the platforms had been evacuated. Because offshore production in the Gulf of Mexico accounts for 25 percent of total U.S. natural gas production, the shutdowns led to worries about the price and availability of natural gas for the coming winter season.

The Minerals Management Service (MMS) reported that 241 of the approximately 3,900 oil and gas platforms and satellites had sustained damage. These numbers are in addition to any damage to the approximately 1,000 platforms within the Louisiana State offshore area. Some of the damage to facilities in the Gulf was initially hidden. Recreational divers discovered major structural damage below the surface of the water at one seemingly undamaged platform. This discovery led to a MMS directive to conduct extensive subsurface inspections of all platforms that were in the path of the storm. The industry will be given until May 1, 1993, to comply with the order because of the severe shortage of qualified divers to accomplish the task. The three largest diving companies in the Gulf already have 363 people engaged in salvage, inspection, and repair work at the scene. Because of the damage, several major gas transporters had to cease operating, leading to short-term disruptions in service of up to 4 days in some parts of Florida and Louisiana.

Evacuation of the Henry Hub in Erath, Louisiana, stopped all deliveries, including those required under natural gas futures contracts traded on the New York Mercantile Exchange. Alternative delivery procedures were required. Using both standard and alternative delivery procedures, the requirements for all natural gas futures contracts for August delivery were fulfilled. By August 29, the Hub was back in full operation.

In mid-October the MMS estimated that producers had recovered about four-fifths of the 2.50 to 2.75 billion cubic feet of daily production that had been shut in because of storm damage. Production from onshore areas and withdrawals from storage filled the firm delivery commitment. MMS has estimated that the repairs necessary to restore the major part of the remaining shut-in production would take as long as 2 additional months.

Net imports of natural gas are expected to rise by 250 billion cubic feet in 1992, a 15-percent increase (Table 11). In 1993, net gas imports are expected to rise by 180 billion cubic feet, or 9.5 percent. Contributing to the increase in gas imports have been competitive prices for Canadian gas, as well as improved access to U.S. transportation systems. Gas import capacity at the U.S.-Canada border as of March 1992 was up by 0.7 billion cubic feet per day from the 1990 level, to 6.9 billion cubic feet per day. Canadian gas import capacity will be up by another 1.3 billion cubic feet per day by the end of 1993 if new and expanded pipelines are completed as planned.¹⁷

The low wellhead prices for the first quarter of this year were caused largely by warm weather and, to a lesser extent, a weak economy (Table 5 and Figure 8). These factors resulted in large supplies which were dumped on the market. The price rebounded sharply in the spring, however, because of abnormally cool temperatures, production cutbacks, and low storage levels. Prices continued to rise throughout the summer, buttressed by the damage to natural gas production facilities caused by Hurricane Andrew in August. Spot prices and futures prices at Henry Hub, Louisiana, for the upcoming winter months rose dramatically immediately following the storm and were fluctuating widely in early September, as the full impact of the hurricane's damage had not yet entirely been assessed.

High spot and futures prices are expected to raise fourth quarter 1992 composite wellhead prices. As a result, the average price for 1992 is expected to be about 13 percent higher than the 1991 average (Table 5). In 1993, assuming normal winter temperatures, rising world oil prices, and a strengthening of the economy, natural gas wellhead prices are projected to rise by about 18 cents per thousand cubic feet. Prolonged severe winter weather could result in some significant supply tightness, leading to temporary price surges in the winter quarters. End-use prices would be affected by such increases, particularly at electric utilities.

Coal

Slight increases in domestic demand and exports, and utility stock additions (partly as a response to a possible coal strike in 1993), contribute to an increase of 1.5 percent in U.S. coal production in 1992 (Table 12). Continued growth in consumption and exports leads to a 1.9-percent increase in coal production for 1993.

¹⁷Energy Information Administration. *Capacity and Service on the Interstate Natural Gas Pipeline System, 1990*. (Washington, DC: June 22, 1992).

¹⁸Steel production forecasts are produced by a sub-model of the Coal Model of the Short-Term Integrated Forecasting System.

Total demand for electricity is expected to increase by 3.2 percent in 1993 because of an economic recovery and normal weather assumptions, after an increase of less than 1 percent between 1991 and 1992 (Table 13). Mild temperatures during most of this year have stifled growth in the residential and commercial sectors. Total electricity demand for the second and third quarters is expected to be 1.6 percent lower in 1992 than in 1991. Because of a sluggish economy, growth in industrial electricity demand for the second and third quarters is expected to be 1.5 percent (Table 13). In 1993, the economic stimulus to electricity demand in the commercial sector is expected to be an improvement in commercial employment of 1.5 percent (Table 13). Despite seemingly high growth rates for electricity in 1993, expected percentage growth on a weather-normalized basis is relatively modest, as shown below:

	Reported	Normalized
1991	1.2	0.9
1992	1.7	0.1
1993	3.2
		2.5

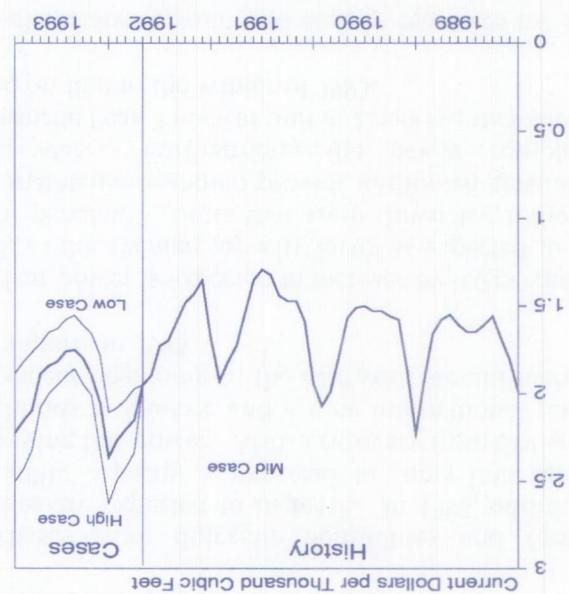
Although mild winter and summer temperatures held down demand for electricity, demand for coal at coke plants is expected to grow in 1992 because of declines in hydroelectric and nuclear power generation. In 1993, utility coal demand is expected to increase by 2.8 percent due to a weather-induced increase in electricity generation and higher demand by the retail and industrial sectors. In between the United Mine Workers of America and the Bituminous Coal Operators Association, while the former does not assume a strike, changes in forecast do not affect negotiations of contract renewals. Consumer stocks are expected to increase in the winter of 1992-1993 in anticipation of contract negotiations between the United Mine Workers of America and the Bituminous Coal Operators Association.

Increases in domestic production of steel are expected to result in higher demand for coal at coke plants. ¹⁸ Coal demanded by the retail and industrial sectors is expected to remain flat.

Although mild winter and summer temperatures held down demand for electricity, demand for coal at coke plants is expected to grow in 1992 because of declines in hydroelectric and nuclear power generation. In 1993, utility coal demand is expected to increase by 2.8 percent due to a weather-induced increase in electricity generation and higher demand by the retail and industrial sectors. In between the United Mine Workers of America and the Bituminous Coal Operators Association, while the former does not assume a strike, changes in forecast do not affect negotiations of contract renewals. Consumer stocks are expected to increase in the winter of 1992-1993 in anticipation of contract negotiations between the United Mine Workers of America and the Bituminous Coal Operators Association.

Sources: History: Energy Information Administration, Natural Gas Monthly (September 1992). Projections: Table 5.

Figure 8. Natural Gas Wellhead Prices



Electricity

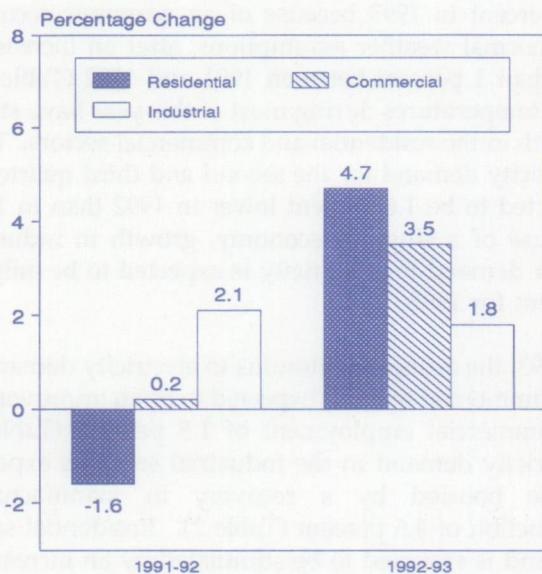


Figure 9. Annual Change in U.S. Electricity Demand by Sector

Source: Table 13.

capacity is expected to be utilized over the next couple of years. Hydroelectric generation is also expected to

increase over the next year as water conditions improve in the Pacific Northwest, where about one-half of total U.S. hydroelectric capacity is located.

Purchases from domestic nonutilities and foreign utilities are expected to increase. In 1993, additional nonutility capacity is expected to come into service supplying this power. Also, a recovery from dry water conditions in Quebec and a new international power agreement beginning in the Midwest, should increase net imports in 1993.

Nuclear power is expected to increase by 0.6 percent in 1993, as the average capacity factor is expected to rise to 70 percent.¹⁹ Units that were down for refueling and maintenance should provide additional generation next year. Furthermore, the newly completed Comanche Peak 2 nuclear unit in Texas is anticipated to come on line in the winter of 1993.

The electricity demand and supply estimates for 1992 do not account for the temporary loss of generation during Hurricane Andrew. Oil-fired units were down for a while in Florida and distribution systems throughout Florida and Louisiana were damaged.²⁰ Hence, actual residential and commercial electricity demand levels and the oil-fired generation level for 1992 could be somewhat lower than expected. The overall influence on the data is expected to be minor, however.

¹⁹Energy Information Administration, Office of Coal, Nuclear, Electric and Alternate Fuels, Analysis and Systems Division, Supply Analysis Branch.

²⁰*The Energy Report*. "Florida, Louisiana utilities on the mend in Andrew's wake." Page 582. (August 31, 1992).

Of the projected 440,000 barrels per day growth in winter petroleum demand under the base case (a 2.6-percent increase), roughly half is attributed to distillate fuel oil, not only because of increased heating oil demand and some switching from gas by industrial customers, but also because of underrating of oil reserves that during this winter, furthermore, will not contribute much to base case winter oil demand growth because on-highway diesel market share of increased economic activity. Residual fuel will be used to base case winter oil demand growth in the case of underrating of oil reserves.

Assumes 1977-1978 winter temperatures.
Energy demand for October 1992 through March 1993.

	Total	Distillate	Residual	LPG	Natural Gas	Electricity	Weather	Case	From Year Ago	Severe	Change	Base
Petroleum (million barrels per day)	17.37	0.44	17.68	0.31	3.31	0.19	3.45	0.14	0.08	1.22	0.01	1.30
(percent)	9.9	22.1	8.1	24.57	22.36	1.67	2.51	0.02	0.07	0.27	0.27	0.49
Mean heating degree-days)
Weather (million tons per day)	0.27	0.06	0.27	0.08	0.27	0.06	0.27	0.07	0.07	0.27	0.06	0.27
Electricity (billion kilowatthours per day)	7.63	0.27	7.70	0.08	7.63	0.27	7.70	0.07	0.07	7.63	0.27	7.70
Natural Gas (billion cubic feet per day)	64.54	2.18	66.49	1.95	64.54	2.18	66.49	1.95	1.95	64.54	2.18	66.49
Residual (million barrels per day)	1.92	0.09	2.00	0.08	1.92	0.09	2.00	0.08	0.08	1.92	0.09	2.00
Total (million barrels per day)	17.37	0.44	17.68	0.31	3.31	0.19	3.45	0.14	0.08	1.22	0.01	1.30

1992-1993 Winter Fuel Demand Summary

Detailed supply and demand figures for the base case outlook can be found in Tables 7, 11, 12, and 13. Based on the mid-price case or base case, fuel demands are indeed expected to rise this winter, as summarized in the table below.

Base Case

heating oil prices. Crude oil prices are higher than last year, and pre-winter inventories for most heating fuels have been tracking below or near last year's levels.

1992-1993 U.S. Winter Fuels Assessment

This chapter examines alternate fuel supply and demand outcomes for the 1992-1993 winter. In this analysis, winter is defined as the period from October 1 through March 31. The mid-price or base case used here (and elsewhere in this report) provides a reference point of difference for discussing plausible outcomes in different weather cases. The severe case, in domestic heating fuel markets. The severe case, in assesses possible impacts of extreme conditions on winter severity can significantly alter projections. A special severe weather case is analyzed here in order to reflect an actually experienced (if rather unlikely) scenario, replicates, for the 1992-1993 winter, the conditions (in terms of heating degree-days) that prevailed in the 1977-1978 winter season. That year, the fourth quarter was about normal, but the first quarter of 1978 was the coldest since 1975, with average temperatures being well below normal for January, February and March (particularly February). The temperatures being well below normal for January, February and March, but the first quarter weather was colder than the first quarter of 1978 is approximately 3 percent. While a severe case is no more likely than a mild weather outcome, the latter may be of less interest to those concerned with evaluating the likelihood and significance of stressful conditions in the winter fuel market.

In the case of natural gas, price levels of last winter are expected to exceed the depressed levels of normal levels (or colder), average fuel prices would be substantially higher than last year, there being a much closer balance between supply capacity and demand than was seen in the last two winters. Assuming that in the case of natural gas, prices are expected to be expected to exceed the depressed levels of last winter, despite the possible effects of Hurricane Andrew on natural gas and petroleum product availability, the domestic spot gas prices, and despite some concerns relating to the possible effects of Hurricane Andrew on seasonal spot gas prices, and record off-market, which has been under-scored by record off-market spot gas pricing in the U.S. natural gas despite the obvious tightening in the U.S. natural gas

propane demand was somewhat depressed because of mild weather conditions last winter, and a noticeable increase in shipments of LPG's to the residential sector would be consistent with a normal weather scenario. Although it is largely due to heating demand, not all of the 90,000 barrels-per-day winter increase is for residential markets, since LPG use in petrochemical operations is also expected to increase as chemicals output increases along with the rest of the industrial sector.

Winter natural gas demand is expected to grow by about 2.2 billion cubic feet per day in the base case (3.5 percent) this winter, compared to last year's results. Growth is expected to be across the board here, although it is concentrated in the residential sector, mostly because of weather. It is believed that this growth in gas demand would bring a convergence between gas use and total capacity to deliver gas to consumers in at least some winter months. Average daily total gas consumption rates for winter such as the base case described here have not been seen since the winter of 1980-1981.²¹ While this may seem high, it should be noted that gas consumption rates for last winter, even with the very mild first quarter, were higher than they had been since the winter of 1981-1982, clearly indicating the underlying strength of demand.

If temperatures this winter are normal, electricity demand is expected to average about 270 million kilowatthours per day (3.6 percent) above last year's winter levels. As noted above, while primary consumption of fossil fuels may be affected by this electricity growth, most of the incremental demand over last winter is expected to be met by improved hydroelectric and nuclear power output. A severe weather case could alter this assessment drastically if, as would normally be assumed, significant additional hydroelectric or nuclear output above the base case level would not be forthcoming. With gas markets already expected to be tight, the principal impacts of extraordinarily cold weather would be on fuel oil and coal.

Severe Weather Case

Detailed demand and supply figures for the severe weather case can be found in Tables 14, 15, and 16. In order to examine a plausible extreme weather case, the

assumption of normal weather was replaced by the assumption that an abnormally cold period would occur in the upcoming winter, replicating an actually observed weather case from recent decades. The 1977-1978 winter experience was used because of its widespread severity. The cold temperatures were concentrated in the first quarter; temperatures during the preceding fourth quarter were about normal.

Demand

The impact of the severe weather case considered here would be to raise petroleum, natural gas and electricity demands by about 2 percent, 3 percent and 1 percent, respectively, above the base case. Direct impacts on petroleum stem from increased heating oil demand (mostly in the Mid Atlantic and New England regions) and higher residential propane demand (concentrated largely in the Midwest region). Indirect impacts on petroleum include fuel switching in the electric utility and industrial sectors due to lessened availability of natural gas outside of the residential and commercial sectors. It is estimated that slightly more than two-thirds of the 310,000 barrels per day increase in petroleum demand would arise from direct impacts of increased space heating demand. Most of the 80,000 barrels per day additional residual fuel oil demand is related to increased reliance on fuel oil at electric utilities as gas is diverted to surging residential demand.

The low rates of gas and oil drilling in the United States in recent years have brought about a slowdown in the growth of domestic gas production capacity (and a deflation of the so-called "gas bubble") that has been obscured by the fact that the peak winter demand months since December 1989 have been characterized by extraordinarily mild weather. Although higher prices for gas, by encouraging higher rates of domestic gas exploration and development, can be expected to eventually insure a comfortable margin between domestic supply capability and expected demand, for the short term the possibility of demand surges placing substantial pressure on spot gas prices and, through substitution effects, on fuel oil prices is high. Despite all of this, for all but the most extreme winter scenarios, gas supplies are expected to be forthcoming in sufficient quantities to avoid serious curtailment of service and to avoid significant adverse impacts on fuel oil markets. Figure 10 illustrates on a monthly basis the base case and severe weather case trajectories for the major winter fuels.

²¹Energy Information Administration. *Historical Monthly Energy Review*. DOE/EIA-0035(73-88). (Washington, DC: 1992). *Monthly Energy Review*. DOE/EIA-0035(92/09). (Washington, DC: September 1992).

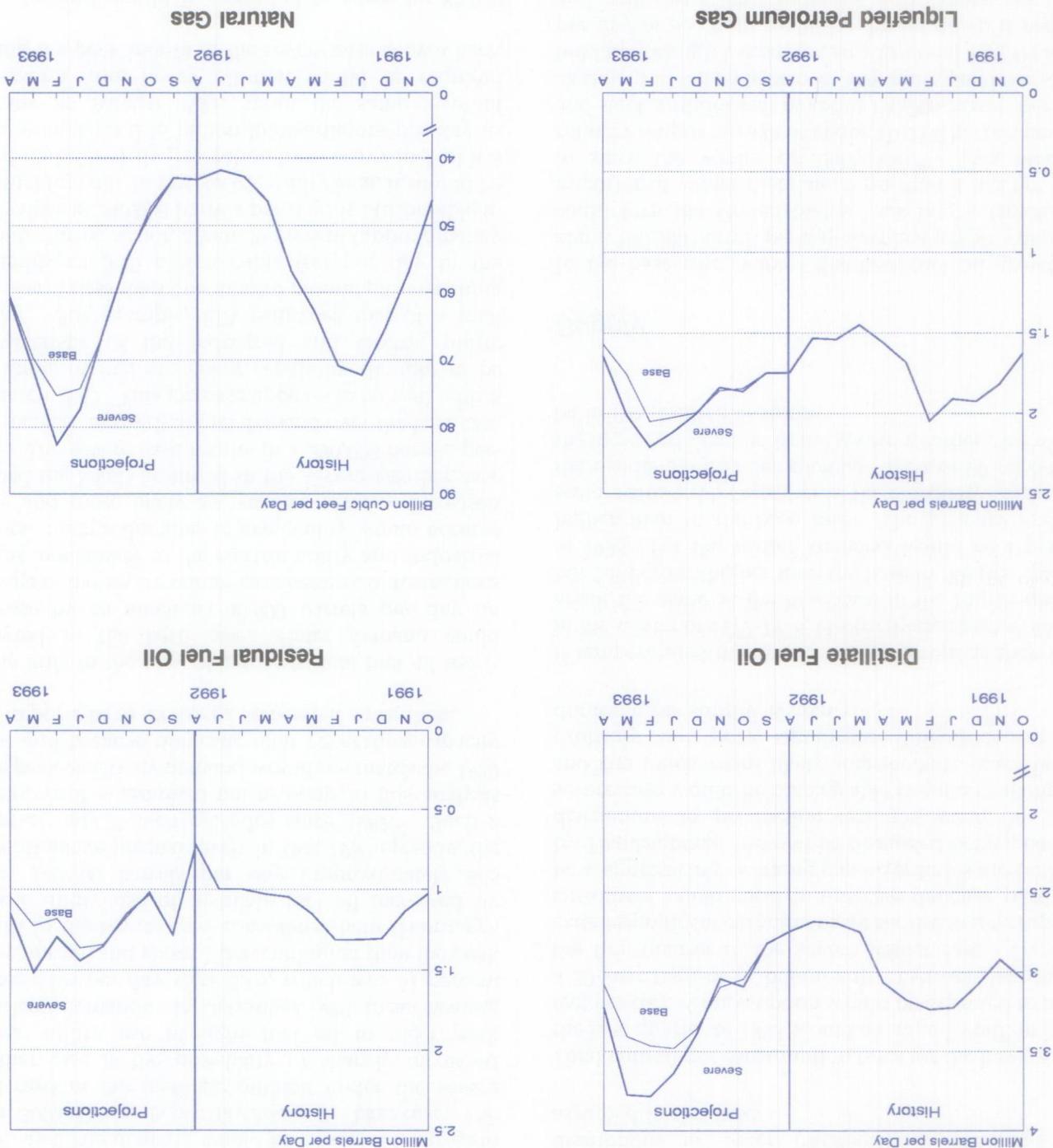


Figure 10. Winter Fuel Demand Cases

Although the heating oil market is not the market it once was, an average additional 2.2 (9.9 percent) heating degree-days per day during the period of October through March could be sufficient to raise distillate fuel use by about 140,000 barrels per day. During the peak month of this demand surge (February 1993), distillate demand would be expected to surge to about 300,000 barrels per day above the base case. The wild card in the distillate outlook under the severe weather case is the possibility of sharply increased electric utility use of light fuel oil to meet peak electricity demands. In December 1989, mean heating degree-days per day were 35.6, which was 31 percent above normal and about 1 percent higher than the peak month in the severe case considered here (February). Electric utility use of distillate fuel oil increased by about 140,000 barrels per day (approximately 365 percent) above normal levels in that 1989 episode, the worst of only 3 such episodes since 1982.²² Such a development is assumed not to occur in this analysis since peak electricity demand would not match the 1989 event and because domestic total generating capacity and imports have increased somewhat since then.

While little in the way of extra residual fuel oil use is expected in the base case, winter demand could increase by as much as 80,000 barrels per day on average in the severe winter case because of restrictions on gas availability to the electric utility and industrial sectors. Such reductions in availability would become more and more likely as weather severity increased toward the levels assumed in the severe weather case here. The severe case results in a 290,000 barrels-per-day increase in residual fuel demand over the base case in March 1993. This increase appears to be well within the limits of fuel switching capability thought to be characteristic of the industrial and electric utility sectors. For example, EIA estimates that of a total short-term (less than one month) natural gas switching capability of 5.25 billion cubic feet per day in the manufacturing sector, about 39 percent (approximately equivalent to 340,000 barrels per day) is attributable to residual fuel oil. In the electric utility area, it should be noted that electricity generation from heavy fuel oil has been as high as 0.36 billion kilowatthours per day as recently as August 1991, about the same level of generation from heavy oil that would be required during the peak month of the severe case shown here.

LPG demand would be expected to surge by 80,000 barrels per day above the base case under the severe winter case considered here. Peak month LPG demand

would average 2.21 million barrels per day, which would be a record level. In actuality, LPG demand might not reach this level, since attendant price increases could be sufficient to encourage petrochemical manufacturers to switch from LPG-based feedstocks to alternatives such as naphtha. No pipeline capacity disruptions or other transportation problems are assumed in this case.

Total natural gas consumption rates for the base case in the first quarter of 1993 would average 73 billion cubic feet per day. Consumption would be expected to reach a 20-year high of 77 billion cubic feet per day during the first quarter in the severe winter case. To what extent significant curtailments of service to interruptible customers would occur in this case depends partly on how aggressively working gas inventories are built up by Thanksgiving. As will be discussed below, barring disruptions to production facilities, even this very severe case would be manageable if quite challenging, and the much more likely intermediate cases would probably not pose significant difficulties for the domestic gas supply system.

If temperatures this winter are as severe as they were in the winter of 1977-1978, electricity demand would be about the same as the base case in the fourth quarter but 1.8 percent higher than the base in the first quarter of 1993. For the winter, demand would be 1 percent higher than in the base case. The primary end-use sectors affected by weather in the electricity market are the residential and commercial. Almost 90 percent of the increased demand in the severe weather case would be in the residential sector.

Supply

In the base case, winter distillate fuel oil growth of about 190,000 barrels per day over last winter's demand could turn the United States back into a (small) net importer of winter distillate, a position it has not been in since the winter of 1989-1990.²³ This assumes refinery output growth of about 110,000 barrels per day and stock withdrawals of about 190,000 barrels per day, as shown in the table below. Depending on how stocks hold up through December, an additional 50,000 barrels per day or so could easily be drawn down if needed, and still leave the industry with more than the estimated minimum operating inventory of 85 million barrels in primary stocks.

²²Energy Information Administration. *Historical Monthly Energy Review*. DOE/EIA-0035(73-88). (Washington, DC: 1992). *Monthly Energy Review*. DOE/EIA-0035(92/09). (Washington, DC: September 1992).

²³Energy Information Administration. *Monthly Energy Review*. DOE/EIA-0035. Various issues. (Washington, DC).

1992-1993 Winter Distillate Supply
(Million Barrels per Day)

	Base Case	Change From Year Ago	Severe Weather ^b	Change From Base
Production	3.03	0.11	3.07	0.04
Net Imports	0.10	0.13	0.13	0.03
Stock Draw	0.19	-0.04	0.26	0.07
Demand	3.31	0.19	3.45	0.14
Stocks (million barrels)				
Beginning	132	-8	132	--
Ending	98	-1	85	-13

In the severe weather case, an additional supply of 140,000 barrels per day of distillate would be required, of which probably an extra 70,000 barrels per day could be drawn from stocks, again depending on how inventories hold up through the end of the year. The remainder of the distillate requirements would be allocated to refinery production and net imports based on import availability and price and on the marginal profitability to domestic refiners of pushing refinery distillate yields toward the higher end of the historical range. Currently, the European supply and demand outlook is expected to allow for substantial import availability. Concerns about the availability and quality of Russian gasoil supplies prompted European refiners to produce substantially more than domestic requirements, resulting in ample primary inventories. Although recent weakness in the dollar has sparked some additional tertiary stock building that typically occurs in the German market in the third quarter, these purchases, in conjunction with concerns about the effects of Hurricane Andrew, have only served to prevent prices from collapsing under the weight of the excess inventory in Europe.²⁴ This suggests that marginal heating oil demand from a U.S. cold snap will induce incremental net imports of up to 50,000 barrels per day.

As shown in the table below, domestic residual fuel oil supply requirements for the winter are not expected to be significantly greater than last year. Since refinery activity is expected to be at a higher level this winter than last year, a larger portion of residual fuel oil demand is expected to be met from domestic production. In the severe case, since refiners would be concentrating on increasing distillate supply, most of the incremental residual fuel demand would be expected to be met by stock withdrawals.

1992-1993 Winter Residual Fuel Supply
(Million Barrels per Day)

	Base Case	Change From Year Ago	Severe Weather ^b	Change From Base
Production	0.99	0.05	1.00	0.01
Net Imports	0.20	-0.02	0.22	0.01
Stock Draw	0.02	-0.02	0.08	0.06
Demand	1.22	0.01	1.30	0.08
Stocks (million barrels)				
Beginning	46	-2	46	--
Ending	42	2	32	-10

LPG inventories are projected to be adequate this winter, at about 9 million barrels above last year at the beginning of the heating season. In contrast to last year, when beginning-of-season propane stock levels were abnormally low because of strong petrochemical demand, this year's traditional seasonal build may be aided by a moderation in petrochemical demand growth during the third quarter due to the sluggish economy.

1992-1993 Winter LPG Supply
(Million Barrels per Day)

	Base Case	Change From Year Ago	Severe Weather ^b	Change From Base
Production	1.53	0.04	1.54	0.01
Net Imports	0.11	0.01	0.13	0.02
Stock Draw	0.28	0.04	0.33	0.05
Demand	1.92	0.09	2.00	0.08
Stocks (million barrels)				
Beginning	125	9	125	--
Ending	74	2	64	-10

In a severe weather scenario, additional inventory withdrawals could be made to meet demand increases. Nevertheless, imports would be likely to rise in that case, perhaps by as much as 20,000 barrels per day on average.

In the event of a severe 1992-1993 winter, comparable with the 1977-1978 winter, U.S. demand for natural gas could rise by as much as 3.0 percent above the base case, or about 2.2 billion cubic feet per day for the period October 1992 to March 1993. As occurred in the winter of 1977-1978, most of the weather impact would

²⁴Energy Market Consultants. *Monthly Energy Market Review*. Various issues. (London, England).

be in the first quarter of 1993, as shown in Figure 10. This kind of growth would be likely to impinge upon total natural gas deliverability limits in one or more months, with February the most likely (Figure 10). Nevertheless, average deliverability is estimated to be in excess of the 77 billion cubic feet per day in the severe weather demand case in the first quarter of 1993.²⁵ Gas production capacity is probably limited to the 54 to 55 billion cubic feet per day range and maximum sustainable import capability is assumed to be between 6.0 and 7.0 billion cubic feet per day. To meet this level of increased demand, dry gas production and imports from Canada would have to rise close to their capacity limits in peak months. This assumes that an additional 1 billion cubic feet per day above the base case level would be made available from storage, implying a winter working gas drawdown rate slightly below last winter's rate. With this help from inventories, average production increases above the base case of 910 million cubic feet per day would be sufficient. Net imports could reach nearly 6.6 billion cubic feet per day in the first quarter. This level would be feasible since maximum import capacity is projected to be over 7 billion cubic feet per day following the opening in November 1992 of two new pipelines into the midwest and the northeast.²⁶

In the severe weather case, the increased load on the electricity generating system would be expected to be carried primarily by coal and secondly by oil. Nuclear and hydroelectric power are assumed not to increase to meet abnormal surges due to unexpected temperature

1992-1993 Winter Natural Gas Supply^a (Billion Cubic Feet per Day)

	Base Case	Change From Year Ago	Severe Weather ^b	Change From Base
Production	52.46	1.87	53.37	0.91
Net Imports	5.87	0.85	5.94	0.06
Stock Draw	7.66	-1.37	8.64	0.98
Demand	64.54	2.18	66.49	1.95
Working Gas Storage (trillion cubic feet)				
Beginning	3.00	-0.20	3.00	--
Ending	1.60	0.06	1.42	-0.18

^aExcludes unaccounted-for gas.

extremes. Incremental natural gas supplies would not be likely to be made available to the utility sector, because the supply of gas would be channeled to the priority customers (residential) when temperatures are unexpectedly cold. It should be noted that in this analysis, it is implicitly assumed that the percentage increase in heating degree-days for the severe weather case is the same in all regions of the country. Extreme temperatures in isolated areas could alter the pattern of fuel choice according to the regional availability of various types of generating capacity.

1992-1993 Winter Electricity Supply (Billion Kilowatthours per Day)

	Base Case	Change From Year Ago	Severe Weather ^b	Change From Base
Utility Generation	7.72	0.27	7.80	0.08
Coal	4.33	0.11	4.39	0.05
Petroleum	0.28	0.00	0.30	0.02
Natural Gas	0.64	0.03	0.65	0.00
Nuclear	1.71	0.05	1.71	0.00
Hydroelectric	0.74	0.09	0.74	0.00
Other	0.03	0.00	0.03	0.00
Demand	7.63	0.27	7.70	0.07

Summary

Because of the tendency for winter temperatures to range below the long-term average across most of the country in recent years, the assumption that weather patterns this winter will be normal or colder-than-normal leads to projections of rising energy demand for heating purposes. For example, if temperatures follow the pattern of the winter of 1977-78 when it was very cold in the first quarter, natural gas and petroleum demand would be 4.0 billion cubic feet per day (5.5 percent) and 610,000 barrels per day (3.5 percent) above the base case, respectively, in the first quarter of 1993. Such an extreme case is unlikely, but within the realm of recent experience. In general, the domestic supply system seems well equipped to handle even an extremely cold winter. Under such a scenario, however, fuel prices are expected to come under strong upward pressure, particularly those for natural gas.

²⁵Energy Information Administration, Office of Oil and Gas, Reserves and Natural Gas Division.

²⁶Energy Information Administration. *Capacity and Service on the Interstate Natural Gas Pipeline System 1990*. (Washington, DC: June 22, 1992).

Appendix

Computation of Petroleum Demand Sensitivities

Table 9 summarizes the response of forecasts for 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: 1990 Model Documentation Report* (DOE/EIA-M009, June 1990). 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 2 projection years, and the resulting change in petroleum demand is calculated. In 1992, only the last quarter is used because the first 3 quarters are considered history. 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 the fourth quarter of 1992 is as follows: $(4967 - 4927) / ((4967 + 4927) / 2)$, or 0.8 percent. For each period, the petroleum demand difference (in million barrels per day) is divided by the percentage difference in GDP. For the fourth quarter of 1992, the petroleum demand difference is 110,000 barrels per day; thus, a 1-percent change in GDP corresponds to a change in demand of $(110,000 / 0.8)$, or 138,000 barrels per day.

For 1993, a 3.4-percent change in GDP corresponds to a change in demand of 540,000 barrels per day; thus, a 1-percent change in GDP corresponds to a demand change of 159,000 barrels per day. The results for 1992 and 1993 are averaged (with a weight of 92 days applied to the fourth quarter 1992 average and a weight of 365 days applied to the 1993 average) to calculate the

average demand change corresponding to a 1-percent change in GDP (155,000 barrels per day in this case).

Table 9 also shows the differences in petroleum demand due to changes in energy prices caused by varying the world crude oil price. There are two values for the change in petroleum demand in each year, one value for the case in which coal and natural gas prices are allowed to change in response to the change in petroleum prices, and a second value for the case in which coal and natural gas prices are held constant. The industrial and electric utilities sectors have some freedom to switch between use of petroleum, coal, and natural gas. If the price of petroleum decreases while the prices of coal and natural gas remain constant, some industrial and utility users will switch from coal or natural gas to petroleum, and petroleum demand will increase. If coal and natural gas prices are reduced to meet the competition from petroleum, then there will be a smaller increase in petroleum demand. In either case, 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 2 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 2 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. If annual changes are calculated, then the magnitude of the changes (in barrels per day) will be only one-half as large.

Table 2. U.S. Macroeconomic and Weather Assumptions

	Price Case	1991				1992				1993				Year		
		1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Macroeconomic^a																
Real Gross Domestic Product (GDP) (billion 1987 dollars)	High									4967	5029	5098	5167	5219	4912	5128
	Mid	4797	4817	4832	4839	4874	4890	4916	4947	4979	5018	5063	5112	4821	4907	5043
	Low								4927	4929	4937	4958	5005		4902	4957
Percentage Change from Prior Year	High								2.6	3.2	4.3	5.1	5.1	1.9	4.4	
	Mid	-1.9	-1.7	-1.0	0.1	1.6	1.5	1.7	2.2	2.2	2.6	3.0	3.3	-1.2	1.8	2.8
	Low								1.8	1.1	1.0	0.9	1.6		1.7	1.1
Annualized Percentage Change from Prior Quarter	High								4.1	5.0	5.5	5.4	4.0			
	Mid	-3.0	1.7	1.2	0.6	2.9	1.3	2.1	2.5	2.6	3.1	3.6	3.9			
	Low								0.9	0.2	0.6	1.7	3.8			
GDP Implicit Price Deflator (index, 1987=1.000)	High								1.093	1.107	1.122	1.138	1.149	1.081	1.129	
	Mid	1.056	1.061	1.064	1.065	1.073	1.077	1.082	1.089	1.096	1.105	1.115	1.125	1.061	1.080	1.110
	Low								1.085	1.085	1.087	1.092	1.102		1.079	1.091
Percentage Change from Prior Year	High								2.6	3.2	4.2	5.2	5.1	1.9	4.4	
	Mid	-1.9	-1.7	-1.0	0.1	1.6	1.5	1.7	2.3	2.1	2.6	3.0	3.3	-1.2	1.8	2.8
	Low								1.9	1.1	0.9	0.9	1.6		1.7	1.1
Real Disposable Personal Income (billion 1987 dollars)	High								3603	3641	3686	3722	3754	3577	3701	
	Mid	3489	3505	3512	3531	3566	3572	3569	3588	3603	3625	3643	3673	3509	3574	3636
	Low								3573	3565	3564	3564	3592		3570	3571
Percentage Change from Prior Year	High								2.0	2.1	3.2	4.3	4.2	1.9	3.5	
	Mid	-0.8	-0.5	0.0	0.6	2.2	1.9	1.6	1.6	1.0	1.5	2.1	2.4	-0.2	1.9	1.7
	Low								1.2	0.0	-0.2	-0.1	0.5		1.7	0.0
Manufacturing Production (index, 1987=1.000)	High								1.125	1.152	1.181	1.210	1.228	1.101	1.193	
	Mid	1.061	1.067	1.085	1.086	1.080	1.095	1.102	1.115	1.127	1.140	1.156	1.172	1.075	1.098	1.149
	Low								1.105	1.102	1.099	1.102	1.117		1.096	1.105
Percentage Change from Prior Year	High								3.6	6.7	7.9	9.8	9.2	2.4	8.4	
	Mid	-2.8	-3.2	-2.4	-0.4	1.8	2.6	1.6	2.7	4.4	4.1	4.9	5.1	-2.2	2.1	4.6
	Low								1.7	2.0	0.4	0.0	1.1		2.0	0.8
OECD Economic Growth ^b (percent)														0.5	1.7	2.9
Weather^c																
Heating Degree Days																
U.S.		2187	420	84	1625	2162	537	103	1669	2401	536	88	1669	4316	4471	4694
New England		2928	706	202	2065	3167	1011	226	2223	3223	928	193	2223	5901	6627	6567
Middle Atlantic		2605	497	106	1850	2831	756	124	2018	2988	727	118	2018	5058	5729	5851
U.S. Gas-Weighted		2174	434	102	1627	2112	531	93	1686	2426	539	81	1686	4337	4422	4732
Cooling Degree Days (U.S.)		36	419	778	70	30	280	726	63	28	327	755	63	1303	1099	1172

^aMacroeconomic 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.

^bOECD: Organization for Economic Cooperation and Development.

^cPopulation-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(92/09); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, July 1992; 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)*, July 1992. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0792.

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

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Macroeconomic^a															
Real Fixed Investment (billion 1987 dollars)	671	670	671	669	681	701	702	712	726	743	762	785	670	699	754
Real Exchange Rate (index)	0.936	0.995	1.000	0.964	0.977	0.985	0.947	0.958	0.976	0.982	0.995	1.004	0.974	0.967	0.989
Business Inventory Change (billion 1987 dollars)	2.7	-11.4	-7.6	-11.3	-8.7	-5.3	4.4	6.7	7.0	9.8	11.3	14.3	-6.9	-0.7	10.6
Wholesale Price Index (index, 1980-1984=1.000)	1.175	1.165	1.162	1.159	1.159	1.173	1.183	1.190	1.202	1.210	1.216	1.224	1.165	1.176	1.213
Consumer Price Index (index, 1980-1984=1.000)	1.349	1.357	1.366	1.378	1.388	1.400	1.411	1.424	1.437	1.448	1.460	1.472	1.363	1.406	1.454
Petroleum Product Price Index (index, 1980-1984=1.000)	0.715	0.651	0.659	0.660	0.589	0.659	0.673	0.689	0.695	0.696	0.700	0.715	0.671	0.652	0.702
Non-Farm Employment (millions)	108.58	108.22	108.25	108.19	108.15	108.44	108.59	108.78	109.10	109.51	110.05	110.69	108.31	108.49	109.84
Commercial Employment (millions)	89.29	89.08	89.14	89.23	89.21	89.54	89.73	89.94	90.27	90.68	91.17	91.75	89.18	89.60	90.96
Total Industrial Production (index, 1987=1.000)	1.058	1.064	1.082	1.080	1.071	1.085	1.092	1.103	1.113	1.125	1.139	1.154	1.071	1.088	1.133
Gas-Weighted Industrial Production (index, 1987=1.000)	1.052	1.048	1.076	1.077	1.080	1.096	1.105	1.111	1.119	1.129	1.140	1.153	1.063	1.098	1.135
Housing Stock (millions)	105.03	105.27	105.51	105.75	106.00	106.27	106.50	106.80	107.10	107.40	107.70	107.93	105.39	106.39	107.53
Miscellaneous															
Vehicle Miles Traveled (million miles per day)	5484	6160	6280	5832	5640	6337	6416	5915	5729	6448	6571	6061	5939	6077	6202
Vehicle Fuel Efficiency (index)	19.10	19.97	20.23	19.36	19.14	20.58	20.50	19.56	19.41	20.86	20.96	19.84	19.67	19.94	20.27
Real Vehicle Fuel Cost (index)	4.72	4.41	4.32	4.44	4.24	4.14	4.24	4.53	4.31	4.08	4.18	4.50	4.47	4.29	4.27
Air Travel Capacity (available ton-miles)	310.1	315.5	329.3	316.8	315.6	329.3	349.2	339.2	337.2	347.9	367.0	357.4	318.0	333.3	352.4
Aircraft Utilization (revenue ton-miles)	155.6	172.7	185.4	168.7	162.2	179.9	198.2	180.0	175.1	190.5	206.2	189.9	170.6	180.1	190.4
Aircraft Yield (cents per ton-mile)	13.60	12.96	12.37	13.30	14.46	12.55	11.92	12.88	13.43	13.26	12.44	13.31	13.06	12.95	13.11
Residential Natural Gas Customers (millions)	50.72	50.32	50.44	50.88	51.15	50.86	50.54	50.96	51.63	51.47	51.15	51.57	50.59	50.88	51.46
Commercial Natural Gas Customers (millions)	4.36	4.30	4.26	4.34	4.33	4.27	4.19	4.25	4.36	4.32	4.24	4.33	4.32	4.26	4.31
Raw Steel Production (millions)	21.56	21.18	22.18	22.52	23.23	23.43	22.52	22.91	23.36	24.14	24.33	25.32	87.45	92.09	97.15

^aMacroeconomic projections from DRI/McGraw-Hill model forecasts are seasonally adjusted at annual rates and modified as appropriate to the mid world oil price case.

Notes: Historical data are printed in bold, forecasts are in italic. Forecasts for miscellaneous variables were generated by simulation C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, July 1992; Federal Reserve System, *Statistical Release G.17(419)*, July 1992. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0792.

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

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Demand^a															
OECD															
U.S. (50 States)	16.49	16.40	17.00	16.96	16.89	16.70	17.21	17.37	17.37	16.84	17.33	17.75	16.71	17.04	17.32
U.S. Territories	0.26	0.23	0.22	0.26	0.23	0.22	0.22	0.25	0.24	0.24	0.24	0.24	0.24	0.23	0.24
Canada	1.57	1.60	1.65	1.62	1.62	1.58	1.61	1.69	1.63	1.61	1.68	1.76	1.61	1.63	1.67
Europe ^b	13.60	13.03	12.72	13.98	13.83	12.84	13.15	13.94	13.84	13.03	13.32	14.12	13.33	13.44	13.58
Japan	5.93	4.89	4.88	5.46	5.92	4.93	4.91	5.59	6.05	4.88	5.01	5.86	5.29	5.34	5.45
Australia and New Zealand	0.79	0.80	0.78	0.82	0.78	0.78	0.81	0.83	0.79	0.82	0.82	0.83	0.80	0.80	0.81
Total OECD	38.62	36.95	37.25	39.10	39.27	37.05	37.92	39.67	39.91	37.42	38.39	40.57	37.98	38.48	39.07
Non-OECD															
Former Soviet Union	8.72	8.23	7.93	7.93	8.01	7.10	6.60	6.80	6.76	6.35	6.22	6.33	8.20	7.13	6.41
China	2.44	2.44	2.44	2.53	2.62	2.65	2.65	2.61	2.80	2.83	2.84	2.80	2.46	2.63	2.82
Europe	1.47	1.31	1.20	1.38	1.20	1.18	1.12	1.17	1.16	1.13	1.08	1.13	1.34	1.17	1.12
Other Non-OECD	16.70	16.23	16.42	17.15	17.55	17.27	17.53	18.07	18.51	18.33	18.55	19.14	16.62	17.61	18.63
Total Non-OECD	29.32	28.20	27.99	28.99	29.38	28.19	27.90	28.66	29.23	28.65	28.68	29.39	28.62	28.53	28.99
Total World Demand	67.94	65.15	65.24	68.10	68.65	65.24	65.82	68.33	69.14	66.07	67.07	69.96	66.60	67.01	68.06
Supply^c															
OECD															
U.S. (50 States)	10.01	9.84	9.80	9.89	9.89	9.75	9.50	9.67	9.59	9.38	9.37	9.48	9.88	9.70	9.45
Canada	2.09	1.95	2.01	2.08	2.10	2.01	1.99	2.03	2.05	2.00	2.02	2.05	2.03	2.03	2.03
North Sea ^d	4.09	3.65	3.97	4.41	4.38	4.11	4.20	4.40	4.37	4.25	4.30	4.76	4.03	4.27	4.42
Other OECD	1.50	1.45	1.48	1.49	1.47	1.48	1.44	1.44	1.44	1.44	1.44	1.44	1.48	1.46	1.44
Total OECD	17.68	16.89	17.26	17.86	17.84	17.34	17.13	17.55	17.46	17.07	17.13	17.73	17.42	17.46	17.35
Non-OECD															
OPEC	24.94	24.46	25.62	26.10	26.24	25.79	26.47	27.22	27.52	27.64	28.22	28.85	25.28	26.43	28.06
Former Soviet Union	10.73	10.52	10.12	9.83	9.41	9.20	8.80	8.60	8.40	8.20	8.00	7.81	10.30	9.00	8.10
China	2.79	2.80	2.80	2.80	2.84	2.84	2.84	2.84	2.85	2.85	2.85	2.85	2.80	2.84	2.85
Mexico	3.15	3.17	3.16	3.14	3.16	3.15	3.15	3.16	3.16	3.16	3.16	3.16	3.15	3.15	3.16
Other Non-OECD	7.58	7.54	7.46	7.58	7.68	7.71	7.83	7.90	7.91	8.01	8.21	8.31	7.54	7.78	8.11
Total Non-OECD	49.19	48.48	49.16	49.45	49.33	48.69	49.08	49.70	49.83	49.85	50.43	50.97	49.07	49.20	50.27
Total World Supply	66.87	65.36	66.42	67.31	67.17	66.04	66.21	67.24	67.29	66.92	67.56	68.70	66.49	66.66	67.62
Stock Changes and Statistical Discrepancy															
Net Stock Withdrawals or Additions (-)															
U.S. (50 States including SPR)	0.70	-0.84	-0.31	0.50	0.52	-0.36	-0.29	-0.07	0.76	-0.47	-0.41	0.20	0.01	-0.05	0.02
Other	0.19	0.81	-1.38	0.06	0.98	-0.44	-0.65	0.57	0.67	-0.78	-0.57	0.62	-0.09	0.11	-0.02
Total Stock Withdrawals	0.89	-0.03	-1.70	0.56	1.50	-0.80	-0.94	0.50	1.43	-1.25	-0.98	0.82	-0.08	0.06	0.00
Statistical Discrepancy	0.18	-0.18	0.52	0.23	-0.02	0.01	0.55	0.59	0.42	0.41	0.49	0.44	0.19	0.28	0.44
Closing Stocks (billion barrels)^e															
Non-OPEC Supply	41.93	40.90	40.80	41.22	40.93	40.25	39.74	40.03	39.77	39.28	39.34	39.86	41.21	40.23	39.56
Net Exports from Former Soviet Union ...	2.01	2.29	2.19	1.90	1.40	2.10	2.20	1.80	1.64	1.84	1.78	1.48	2.10	1.88	1.69

^aDemand 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.

^bOECD Europe includes eastern Germany.

^cIncludes 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.

^dIncludes offshore supply from Denmark, Germany, the Netherlands, Norway, and the United Kingdom.

^eExcludes 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 C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Energy Information Administration, *International Petroleum Statistics Report*, DOE/EIA-0520(92/09); and *International Energy Annual 1990*, DOE/EIA-0219(90); Organization for Economic Cooperation and Development, Annual and Monthly Oil Statistics Database through March 1992.

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

	Price Case	1991				1992				1993				Year			
		1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993	
Imported Crude Oil^a (dollars per barrel)	Low									17.00	17.00	17.00	17.00	17.00	17.86	17.00	
	Mid	19.36	18.05	18.62	18.82	16.16	18.65	19.42		20.00	20.00	20.00	20.00	20.00	18.69	18.65	20.00
	High									22.00	22.00	22.00	22.00	22.00			19.15
Natural Gas Wellhead (dollars per thousand cubic feet)	Low									2.03	1.84	1.65	1.62	1.83	1.75	1.73	
	Mid	1.67	1.43	1.40	1.83	1.49	1.59	1.86		2.20	2.10	1.82	1.81	2.16	1.59	1.79	1.97
	High									2.42	2.31	2.00	1.99	2.43			1.85
Petroleum Products																	
Gasoline, Retail ^b (dollars per gallon)	Low									1.21	1.14	1.17	1.22	1.25	1.19	1.20	
	Mid	1.21	1.19	1.19	1.19	1.12	1.19	1.23		1.26	1.20	1.23	1.28	1.31	1.20	1.20	1.26
	High									1.29	1.24	1.27	1.32	1.36			1.21
No. 2 Diesel Oil, Retail (dollars per gallon)	Low									1.14	1.14	1.10	1.12	1.22	1.12	1.14	
	Mid	1.20	1.08	1.11	1.13	1.07	1.13	1.15		1.21	1.20	1.16	1.18	1.29	1.13	1.14	1.21
	High									1.25	1.24	1.20	1.23	1.33			1.15
No. 2 Heating Oil, Wholesale (dollars per gallon)	Low									0.60	0.56	0.51	0.56	0.62	0.58	0.56	
	Mid	0.69	0.56	0.60	0.63	0.53	0.59	0.62		0.67	0.63	0.56	0.62	0.69	0.62	0.60	0.63
	High									0.72	0.67	0.60	0.66	0.74			0.61
No. 2 Heating Oil, Retail (dollars per gallon)	Low									0.96	0.97	0.88	0.88	0.99	0.94	0.94	
	Mid	1.11	0.94	0.88	0.96	0.94	0.92	0.92		1.02	1.04	0.94	0.94	1.06	1.02	0.95	1.00
	High									1.06	1.08	0.98	0.98	1.10			0.95
No. 6 Residual Fuel Oil, Retail ^c (dollars per barrel)	Low									14.64	14.33	13.20	13.05	14.40	13.84	13.79	
	Mid	17.47	12.69	13.01	14.07	11.90	13.63	15.43		16.85	16.54	15.38	15.21	16.62	14.30	14.43	15.99
	High									18.33	18.03	16.85	16.68	18.10			14.82
Electric Utility Fuels																	
Coal (dollars per million Btu)	Low									1.40	1.39	1.41	1.39	1.39	1.41	1.39	
	Mid	1.46	1.48	1.43	1.42	1.42	1.43	1.41		1.43	1.44	1.45	1.43	1.42	1.45	1.42	1.43
	High									1.46	1.47	1.49	1.46	1.46			1.43
Heavy Oil ^d (dollars per million Btu)	Low									2.60	2.47	2.26	2.26	2.55	2.43	2.39	
	Mid	2.90	2.28	2.31	2.49	2.14	2.36	2.63		2.96	2.82	2.60	2.61	2.91	2.49	2.52	2.74
	High									3.20	3.05	2.83	2.84	3.15			2.58
Natural Gas (dollars per million Btu)	Low									2.54	2.40	2.12	2.16	2.39	2.27	2.25	
	Mid	2.40	1.98	1.96	2.42	2.14	2.08	2.29		2.64	2.58	2.28	2.32	2.62	2.15	2.29	2.42
	High									2.76	2.73	2.41	2.46	2.80			2.32
Other Residential																	
Natural Gas (dollars per thousand cubic feet)	Low									5.94	5.75	6.23	7.36	5.96	5.88	6.04	
	Mid	5.56	6.22	7.15	5.62	5.52	6.00	7.24		5.98	5.81	6.33	7.46	6.07	5.82	5.89	6.13
	High									6.02	5.89	6.41	7.57	6.17			5.90
Electricity (cents per kilowatthour)	Low									7.9	7.7	8.2	8.4	8.0	8.1	8.0	
	Mid	7.6	8.2	8.4	8.0	7.8	8.3	8.5		8.0	7.9	8.4	8.7	8.2	8.1	8.2	8.3
	High									8.1	8.1	8.6	8.9	8.4			8.2

^aCost of imported crude oil to U.S. refineries.

^bAverage for all grades and services.

^cAverage for all sulfur contents.

^dIncludes fuel oils No. 4, No. 5, and No. 6 and topped crude fuel oil prices.

Notes: Data are estimated for the second quarter of 1992. 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. Historical data are printed in bold, forecasts are in italic. The forecasts were generated by the following simulations of the Short-Term Integrated Forecasting System: C102092BBB14:56 for the mid oil price case, C101992BLB14:00 for the low oil price case, and C101992BHB15:56 for the high oil price case.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); and *Petroleum Marketing Monthly*, DOE/EIA-0380(92/09).

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

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Crude Oil Supply															
Domestic Production ^a	7.56	7.41	7.34	7.35	7.35	7.18	7.03	7.00	6.92	6.75	6.69	6.71	7.42	7.14	6.77
Alaska	1.88	1.77	1.76	1.78	1.79	1.71	1.66	1.66	1.60	1.53	1.52	1.56	1.80	1.71	1.55
Lower 48	5.68	5.64	5.58	5.58	5.56	5.47	5.37	5.33	5.31	5.23	5.17	5.15	5.62	5.43	5.21
Net Imports (including SPR) ^b	5.20	5.94	6.04	5.48	5.34	5.97	6.38	6.26	6.23	6.69	6.93	6.67	5.67	5.99	6.63
Gross Imports (excluding SPR)	5.31	6.08	6.14	5.59	5.42	6.04	6.47	6.36	6.35	6.79	7.02	6.78	5.78	6.07	6.73
SPR Imports	-0.19	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.05	0.01	0.00
Exports	0.11	0.14	0.10	0.12	0.08	0.08	0.09	0.10	0.12	0.10	0.09	0.10	0.12	0.09	0.10
Other SPR Supply	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.00	0.01	0.02
SPR Stock Withdrawn or Added (-)	0.19	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	0.05	-0.01	-0.02
Other Stock Withdrawn or Added (-)	-0.16	-0.11	0.07	0.17	-0.15	0.15	-0.03	-0.16	0.00	0.04	-0.02	0.00	-0.01	-0.05	0.01
Product Supplied and Losses	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude Oil	0.29	0.27	0.30	0.12	0.32	0.38	0.40	0.45	0.29	0.28	0.36	0.32	0.24	0.39	0.31
Total Crude Oil Supply	12.87	13.50	13.73	13.10	12.84	13.66	13.76	13.53	13.42	13.74	13.94	13.68	13.30	13.45	13.70
Other Supply															
NGL Production	1.67	1.65	1.62	1.69	1.69	1.70	1.64	1.64	1.63	1.62	1.62	1.63	1.66	1.67	1.63
Other Hydrocarbon and Alcohol Inputs	0.09	0.09	0.09	0.10	0.12	0.09	0.11	0.19	0.16	0.09	0.11	0.19	0.09	0.13	0.14
Crude Oil Product Supplied	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.68	0.68	0.74	0.75	0.73	0.78	0.73	0.68	0.67	0.69	0.70	0.69	0.71	0.73	0.69
Net Product Imports ^c	0.48	1.18	1.18	0.97	0.83	0.96	1.20	1.29	0.81	1.31	1.45	1.45	0.96	1.07	1.26
Gross Product Imports ^c	1.56	1.98	1.94	1.88	1.72	1.81	2.01	2.19	1.69	2.16	2.27	2.35	1.84	1.93	2.12
Product Exports	1.07	0.80	0.76	0.90	0.89	0.85	0.81	0.90	0.89	0.85	0.82	0.90	0.88	0.86	0.86
Product Stock Withdrawn or Added (-) ^d	0.66	-0.72	-0.38	0.32	0.68	-0.50	-0.24	0.10	0.77	-0.50	-0.37	0.22	-0.03	0.01	0.03
Total Supply	16.67	16.39	17.01	16.96	16.90	16.70	17.21	17.45	17.48	16.98	17.48	17.88	16.76	17.06	17.45
Demand															
Motor Gasoline	6.83	7.34	7.39	7.17	7.01	7.33	7.46	7.24	7.06	7.40	7.51	7.31	7.19	7.26	7.32
Jet Fuel	1.51	1.38	1.52	1.48	1.41	1.39	1.51	1.52	1.44	1.41	1.56	1.59	1.47	1.46	1.50
Distillate Fuel Oil	3.11	2.79	2.76	3.02	3.21	2.84	2.75	3.17	3.46	2.96	2.85	3.28	2.92	2.99	3.14
Residual Fuel Oil	1.19	1.14	1.14	1.16	1.26	1.03	1.00	1.21	1.30	1.08	1.07	1.26	1.16	1.12	1.18
Other Oils ^e	3.84	3.75	4.18	4.12	3.99	4.12	4.49	4.31	4.21	4.13	4.50	4.44	3.98	4.23	4.32
Total Demand	16.49	16.40	17.00	16.96	16.89	16.70	17.21	17.45	17.48	16.98	17.48	17.88	16.71	17.06	17.45
Total Petroleum Net Imports	5.68	7.12	7.22	6.45	6.16	6.93	7.59	7.55	7.03	8.00	8.38	8.12	6.62	7.06	7.89
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) ^f	337	347	341	325	339	325	328	342	342	338	340	340	325	342	340
Total Motor Gasoline	210	214	216	219	220	225	210	220	216	211	213	217	219	220	217
Finished Motor Gasoline	171	177	178	182	181	188	170	181	176	173	174	178	182	181	178
Blending Components	38	37	39	37	39	37	40	39	40	38	39	39	37	39	39
Jet Fuel	44	48	50	49	44	45	49	49	46	47	47	48	49	49	48
Distillate Fuel Oil	98	114	140	144	98	104	132	137	98	105	128	131	144	137	131
Residual Fuel Oil	43	44	48	50	40	40	46	47	42	44	43	48	50	47	48
Other Oils ^g	257	298	299	262	260	294	294	269	249	289	300	266	262	269	266
Total Stocks (excluding SPR)	989	1065	1094	1048	1001	1033	1058	1063	993	1035	1070	1050	1048	1063	1050
Crude Oil in SPR	568	568	569	569	569	570	571	573	574	576	578	580	569	573	580
Total Stocks (including SPR)	1558	1634	1663	1617	1569	1602	1629	1636	1567	1611	1648	1630	1617	1636	1630

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes 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.

^fIncludes crude oil in transit to refineries.

^gIncludes 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 C101992PLB16:51 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1991*, DOE/EIA-0340(91)/1; *Petroleum Supply Monthly*, DOE/EIA-0109(91/01-92/09); 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)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Crude Oil Supply															
Domestic Production ^a	7.56	7.41	7.34	7.35	7.35	7.18	7.03	7.16	7.12	6.98	6.93	6.97	7.42	7.18	7.00
Alaska	1.88	1.77	1.76	1.78	1.79	1.71	1.66	1.71	1.66	1.58	1.58	1.62	1.80	1.72	1.61
Lower 48	5.68	5.64	5.58	5.58	5.56	5.47	5.37	5.45	5.46	5.39	5.35	5.35	5.62	5.46	5.39
Net Imports (including SPR) ^b	5.20	5.94	6.04	5.48	5.34	5.97	6.38	6.08	6.00	6.40	6.62	6.34	5.67	5.95	6.34
Gross Imports (excluding SPR)	5.31	6.08	6.14	5.59	5.42	6.04	6.47	6.19	6.12	6.51	6.70	6.44	5.78	6.03	6.44
SPR Imports	-0.19	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	0.01
Exports	0.11	0.14	0.10	0.12	0.08	0.08	0.09	0.10	0.12	0.10	0.09	0.10	0.12	0.09	0.10
Other SPR Supply	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.03	0.00	0.01	0.02
SPR Stock Withdrawn or Added (-)	0.19	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	0.05	-0.01	-0.02
Other Stock Withdrawn or Added (-)	-0.16	-0.11	0.07	0.17	-0.15	0.15	-0.03	-0.16	0.00	0.04	-0.02	0.00	-0.01	-0.05	0.01
Product Supplied and Losses	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude Oil	0.29	0.27	0.30	0.12	0.32	0.38	0.40	0.43	0.27	0.26	0.34	0.29	0.24	0.39	0.29
Total Crude Oil Supply	12.87	13.50	13.73	13.10	12.84	13.66	13.76	13.50	13.37	13.66	13.84	13.58	13.30	13.44	13.61
Other Supply															
NGL Production	1.67	1.65	1.62	1.69	1.69	1.70	1.64	1.64	1.63	1.62	1.63	1.66	1.67	1.67	1.63
Other Hydrocarbon and Alcohol Inputs	0.09	0.09	0.09	0.10	0.12	0.09	0.11	0.19	0.16	0.09	0.11	0.19	0.09	0.13	0.14
Crude Oil Product Supplied	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.68	0.68	0.74	0.75	0.73	0.78	0.73	0.68	0.67	0.69	0.70	0.69	0.71	0.73	0.68
Net Product Imports ^c	0.48	1.18	1.18	0.97	0.83	0.96	1.20	1.23	0.74	1.25	1.40	1.43	0.96	1.06	1.21
Gross Product Imports ^c	1.56	1.98	1.94	1.88	1.72	1.81	2.01	2.13	1.62	2.10	2.22	2.33	1.84	1.92	2.07
Product Exports	1.07	0.80	0.76	0.90	0.89	0.85	0.81	0.90	0.89	0.85	0.82	0.90	0.88	0.86	0.86
Product Stock Withdrawn or Added (-) ^d	0.66	-0.72	-0.38	0.32	0.68	-0.50	-0.24	0.10	0.77	-0.50	-0.37	0.22	-0.03	0.01	0.03
Total Supply	16.67	16.39	17.01	16.96	16.90	16.70	17.21	17.37	17.37	16.84	17.33	17.75	16.76	17.04	17.32
Demand															
Motor Gasoline	6.83	7.34	7.39	7.17	7.01	7.33	7.46	7.20	7.02	7.36	7.47	7.27	7.19	7.25	7.28
Jet Fuel	1.51	1.38	1.52	1.48	1.41	1.39	1.51	1.51	1.44	1.40	1.55	1.58	1.47	1.46	1.49
Distillate Fuel Oil	3.11	2.79	2.76	3.02	3.21	2.84	2.75	3.17	3.45	2.95	2.84	3.27	2.92	2.99	3.13
Residual Fuel Oil	1.19	1.14	1.14	1.16	1.26	1.03	1.00	1.18	1.26	1.02	1.00	1.21	1.16	1.11	1.12
Other Oils ^e	3.84	3.75	4.18	4.12	3.99	4.12	4.49	4.31	4.20	4.11	4.48	4.42	3.98	4.23	4.30
Total Demand	16.49	16.40	17.00	16.96	16.89	16.70	17.21	17.37	17.37	16.84	17.33	17.75	16.71	17.04	17.32
Total Petroleum Net Imports	5.68	7.12	7.22	6.45	6.16	6.93	7.59	7.31	6.73	7.66	8.01	7.77	6.62	7.00	7.55
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) ^f	337	347	341	325	339	325	328	342	342	338	340	340	325	342	340
Total Motor Gasoline	210	214	216	219	220	225	210	220	216	211	213	217	219	220	217
Finished Motor Gasoline	171	177	178	182	181	188	170	181	176	173	174	178	182	181	178
Blending Components	38	37	39	37	39	37	40	39	40	38	39	39	37	39	39
Jet Fuel	44	48	50	49	44	45	49	49	46	47	47	48	49	49	48
Distillate Fuel Oil	98	114	140	144	98	104	132	137	98	105	128	131	144	137	131
Residual Fuel Oil	43	44	48	50	40	40	46	47	42	44	43	48	50	47	48
Other Oils ^g	257	298	299	262	260	294	294	269	249	289	300	266	262	269	266
Total Stocks (excluding SPR)	989	1065	1094	1048	1001	1033	1058	1063	993	1035	1070	1050	1048	1063	1050
Crude Oil in SPR	568	568	569	569	569	570	571	573	574	576	578	580	569	573	580
Total Stocks (including SPR)	1558	1634	1663	1617	1569	1602	1629	1636	1567	1611	1648	1630	1617	1636	1630

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes 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.

^fIncludes crude oil in transit to refineries.

^gIncludes 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 C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1991*, DOE/EIA-0340(91)/1; *Petroleum Supply Monthly*, DOE/EIA-0109(91/01-92/09); 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)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Crude Oil Supply															
Domestic Production ^a	7.56	7.41	7.34	7.35	7.35	7.18	7.03	7.30	7.30	7.16	7.12	7.16	7.42	7.21	7.18
Alaska	1.88	1.77	1.76	1.78	1.79	1.71	1.66	1.74	1.71	1.63	1.62	1.67	1.80	1.73	1.66
Lower 48	5.68	5.64	5.58	5.58	5.56	5.47	5.37	5.56	5.59	5.53	5.49	5.49	5.62	5.49	5.53
Net Imports (including SPR) ^b	5.20	5.94	6.04	5.48	5.34	5.97	6.38	5.94	5.81	6.19	6.38	6.11	5.67	5.91	6.12
Gross Imports (excluding SPR)	5.31	6.08	6.14	5.59	5.42	6.04	6.47	6.05	5.93	6.29	6.47	6.21	5.78	5.99	6.23
SPR Imports	-0.19	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.05	0.01	0.00
Exports	0.11	0.14	0.10	0.12	0.08	0.08	0.09	0.10	0.12	0.10	0.09	0.10	0.12	0.09	0.10
Other SPR Supply	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.01	0.02
SPR Stock Withdrawn or Added (-)	0.19	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	0.05	-0.01
Other Stock Withdrawn or Added (-)	-0.16	-0.11	0.07	0.17	-0.15	0.15	-0.03	-0.16	0.00	0.04	-0.02	0.00	-0.01	-0.05	0.01
Product Supplied and Losses	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude Oil	0.29	0.27	0.30	0.12	0.32	0.38	0.40	0.42	0.25	0.24	0.32	0.27	0.24	0.38	0.27
Total Crude Oil Supply	12.87	13.50	13.73	13.10	12.84	13.66	13.76	13.49	13.34	13.61	13.77	13.52	13.30	13.44	13.56
Other Supply															
NGL Production	1.67	1.65	1.62	1.69	1.69	1.70	1.64	1.64	1.64	1.63	1.63	1.64	1.66	1.67	1.63
Other Hydrocarbon and Alcohol Inputs	0.09	0.09	0.09	0.10	0.12	0.09	0.11	0.19	0.16	0.09	0.11	0.19	0.09	0.13	0.14
Crude Oil Product Supplied	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Processing Gain	0.68	0.68	0.74	0.75	0.73	0.78	0.73	0.68	0.66	0.68	0.69	0.68	0.71	0.73	0.68
Net Product Imports ^c	0.48	1.18	1.18	0.97	0.83	0.96	1.20	1.19	0.69	1.22	1.36	1.43	0.96	1.04	1.18
Gross Product Imports ^c	1.56	1.98	1.94	1.88	1.72	1.81	2.01	2.09	1.58	2.06	2.19	2.34	1.84	1.90	2.04
Product Exports	1.07	0.80	0.76	0.90	0.89	0.85	0.81	0.90	0.89	0.85	0.82	0.90	0.88	0.86	0.86
Product Stock Withdrawn or Added (-) ^d	0.66	-0.72	-0.38	0.32	0.68	-0.50	-0.24	0.10	0.77	-0.50	-0.37	0.22	-0.03	0.01	0.03
Total Supply	16.67	16.39	17.01	16.96	16.90	16.70	17.20	17.31	17.29	16.74	17.23	17.70	16.76	17.03	17.24
Demand															
Motor Gasoline	6.83	7.34	7.39	7.17	7.01	7.33	7.46	7.17	7.00	7.33	7.44	7.25	7.19	7.24	7.26
Jet Fuel	1.51	1.38	1.52	1.48	1.41	1.39	1.51	1.51	1.43	1.40	1.54	1.58	1.47	1.45	1.49
Distillate Fuel Oil	3.11	2.79	2.76	3.02	3.21	2.84	2.75	3.16	3.44	2.94	2.83	3.27	2.92	2.99	3.12
Residual Fuel Oil	1.19	1.14	1.14	1.16	1.26	1.03	1.00	1.16	1.23	0.98	0.96	1.19	1.16	1.11	1.09
Other Oils ^e	3.84	3.75	4.18	4.12	3.99	4.12	4.49	4.31	4.18	4.09	4.46	4.42	3.98	4.23	4.29
Total Demand	16.49	16.40	17.00	16.96	16.89	16.70	17.20	17.31	17.29	16.74	17.23	17.70	16.71	17.03	17.24
Total Petroleum Net Imports	5.68	7.12	7.22	6.45	6.16	6.93	7.58	7.13	6.50	7.40	7.74	7.54	6.62	6.95	7.30
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) ^f	337	347	341	325	339	325	328	342	342	338	340	340	325	342	340
Total Motor Gasoline	210	214	216	219	220	225	210	220	216	211	213	217	219	220	217
Finished Motor Gasoline	171	177	178	182	181	188	170	181	176	173	174	178	182	181	178
Blending Components	38	37	39	37	39	37	40	39	40	38	39	39	37	39	39
Jet Fuel	44	48	50	49	44	45	49	49	46	47	47	48	49	49	48
Distillate Fuel Oil	98	114	140	144	98	104	132	137	98	105	128	131	144	137	131
Residual Fuel Oil	43	44	48	50	40	40	46	47	42	44	43	48	50	47	48
Other Oils ^g	257	298	299	262	260	294	294	269	249	289	300	266	262	269	266
Total Stocks (excluding SPR)	989	1065	1094	1048	1001	1033	1058	1063	993	1035	1070	1050	1048	1063	1050
Crude Oil in SPR	568	568	569	569	569	570	571	573	574	576	578	580	569	573	580
Total Stocks (including SPR)	1558	1634	1663	1617	1569	1602	1629	1636	1567	1611	1648	1630	1617	1636	1630

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes 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.

^fIncludes crude oil in transit to refineries.

^gIncludes 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 C101992WHB16:35 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1991*, DOE/EIA-0340(91)/1; *Petroleum Supply Monthly*, DOE/EIA-0109(91/01-92/09); and *Weekly Petroleum Status Report*, DOE/EIA-0208(various issues).

Table 9. U.S. Petroleum Demand Sensitivities

	1992	1993
	One Quarter ^a	Four Quarters ^a
Economic Activity		
Gross Domestic Product (billion 1987 dollars)	4,927 - 4,967	4,957 - 5,128
Resulting Change in Petroleum Demand (million barrels per day) ^b	0.11	0.54
Energy Prices		
Imported Crude Oil (nominal dollars per barrel) ^c	\$17 - \$22	\$17 - \$22
Resulting Change in Petroleum Demand (million barrels per day) ^b		
Due to Changes in All Energy Prices	0.10	0.14
Due to Changes in the Crude Oil Price	0.14	0.22
Weather		
Heating Degree Days ^d	1,520 - 1,856	3,758 - 4,450
Resulting Change in Petroleum Demand (million barrels per day)	0.46	0.72
Cooling Degree Days ^d	--	991 - 1,184
Resulting Change in Petroleum Demand (million barrels per day) ^b	--	0.19

^aIn the weather case, calculations apply to certain quarters only, as follows: for heating degree days, the average of first and fourth quarters only are used; for cooling degree days, the average of second and third quarters only are used.

^bRanges of petroleum product supplied associated with varying each determinant (or determinants), holding other things equal.

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

^dHeating and cooling degree days are U.S. 1980 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	7.16	6.71	0.45	0.17	0.28
Lower 48 States	5.49	5.15	0.34	0.12	0.22
Alaska	1.67	1.56	0.10	0.05	0.05

Note: Components provided are for the fourth quarter 1993 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)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Total Dry Gas Production ^a	4.57	4.37	4.32	4.68	4.58	4.39	4.44	4.83	4.72	4.65	4.64	4.78	17.94	18.24	18.79
Net Imports	0.42	0.39	0.37	0.46	0.46	0.47	0.43	0.53	0.54	0.50	0.48	0.56	1.64	1.89	2.07
Supplemental Gaseous Fuels	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.12	0.11	0.11
Total New Supply	5.02	4.79	4.71	5.17	5.08	4.89	4.89	5.39	5.28	5.18	5.15	5.36	19.69	20.25	20.97
Underground Working Gas Storage															
Opening	3.07	1.91	2.56	3.20	2.82	1.54	2.15	2.99	2.83	1.60	2.04	3.03	3.07	2.82	2.83
Closing	1.91	2.56	3.20	2.82	1.54	2.15	2.99	2.83	1.60	2.04	3.03	2.73	2.82	2.83	2.73
Net Withdrawals ^b	1.05	-0.70	-0.65	0.39	1.20	-0.61	-0.83	0.16	1.24	-0.44	-0.99	0.31	0.09	-0.09	0.11
Total Supply ^a	6.07	4.10	4.06	5.55	6.27	4.28	4.06	5.55	6.52	4.73	4.16	5.67	19.78	20.16	21.08
Balancing Item ^c	0.04	0.03	-0.22	-0.39	-0.02	0.15	-0.12	-0.38	0.05	0.05	-0.13	-0.38	-0.53	-0.37	-0.41
Total Primary Supply ^a	6.11	4.13	3.84	5.16	6.25	4.43	3.94	5.17	6.57	4.78	4.03	5.29	19.24	19.79	20.67
Demand															
Lease and Plant Fuel	0.32	0.30	0.30	0.33	0.32	0.30	0.31	0.32	0.33	0.31	0.31	0.32	1.25	1.25	1.27
Pipeline Use	0.22	0.15	0.14	0.18	0.22	0.16	0.14	0.17	0.21	0.17	0.15	0.18	0.68	0.69	0.71
Residential	2.09	0.75	0.38	1.35	2.06	0.85	0.43	1.30	2.23	0.95	0.43	1.31	4.57	4.64	4.93
Commercial	1.10	0.50	0.36	0.76	1.08	0.54	0.37	0.73	1.13	0.56	0.36	0.73	2.71	2.71	2.79
Industrial	1.88	1.71	1.74	1.91	2.02	1.85	1.75	1.95	2.10	1.92	1.84	2.03	7.25	7.56	7.88
Electric Utilities	0.51	0.73	0.92	0.63	0.55	0.73	0.95	0.70	0.57	0.87	0.94	0.70	2.79	2.93	3.08
Total Demand	6.11	4.13	3.84	5.16	6.25	4.43	3.94	5.17	6.57	4.78	4.03	5.29	19.24	19.79	20.67

^aExcludes nonhydrocarbon gases removed.

^bNet withdrawals may vary from the difference between opening and closing stocks of gas in working gas storage due to book transfers between base and working gas categories, and other storage operator revisions of working gas inventories.

^cThe balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

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 C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); *Natural Gas Monthly*, DOE/EIA-0130(92/09); and *Electric Power Monthly*, DOE/EIA-0226(92/09).

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

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Production	254	237	251	252	257	242	253	257	254	248	258	268	994	1009	1028
Primary Stock Levels ^a															
Opening	33	42	41	34	33	40	40	35	33	37	36	33	33	33	33
Closing	42	41	34	33	40	40	35	33	37	36	33	35	33	33	35
Net Withdrawals	-9	1	7	1	-7	0	5	2	-4	1	3	-2	0	0	-2
Imports	1	1	1	1	1	1	1	1	1	1	1	1	3	3	3
Exports	22	26	31	29	25	27	31	28	24	30	29	29	109	111	113
Total Net Domestic Supply	224	212	228	224	226	216	228	232	226	220	233	238	889	901	916
Secondary Stock Levels ^b															
Opening	168	169	172	164	168	169	173	169	172	174	170	169	168	168	172
Closing	169	172	164	168	169	173	169	172	174	170	169	170	168	172	170
Net Withdrawals	-1	-3	8	-4	-1	-5	4	-3	-2	4	1	-1	0	-4	2
Total Supply	223	210	236	220	225	212	232	229	224	224	234	237	889	897	918
Demand															
Coke Plants	8	8	9	9	8	8	9	9	9	9	9	9	34	34	37
Electric Utilities	189	182	208	192	191	184	205	198	194	195	206	205	772	778	800
Retail and General Industry ^c	22	18	19	22	22	19	19	22	22	19	19	22	81	82	82
Total Demand	219	209	236	224	221	211	233	229	224	224	234	237	888	894	918
Discrepancy ^d	4	1	0	-3	4	0	-1	0	0	0	0	0	2	3	0

^aPrimary stocks are held at the mines, preparation plants, and distribution points.

^bSecondary stocks are held by users. Most of the secondary stocks are held by electric utilities.

^cSynfuels plant demand in 1990 was 1.7 million tons per quarter, and is assumed to remain at that level in 1991 and 1992.

^dHistorical 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 C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); and *Quarterly Coal Report*, DOE/EIA-0221(92/2Q).

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

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Net Utility Generation															
Coal	377.8	367.9	416.7	386.8	386.6	373.4	411.0	398.7	389.9	396.1	410.4	414.2	1549.2	1569.7	1610.6
Petroleum	26.7	30.2	31.5	23.0	27.3	18.7	23.0	24.1	26.2	23.2	27.3	26.2	111.4	93.2	103.0
Natural Gas	48.5	68.4	87.1	60.2	52.2	69.5	88.7	64.5	52.3	79.4	86.4	64.4	264.1	274.9	282.5
Nuclear	151.4	142.6	171.1	147.5	156.5	139.1	159.3	151.3	159.3	139.1	164.6	147.0	612.6	606.2	609.9
Hydroelectric	73.4	80.0	64.4	57.7	61.0	64.4	59.8	63.2	71.1	78.9	66.6	68.9	275.5	247.4	285.5
Geothermal and Other ^a	2.5	2.4	2.5	2.6	2.6	2.5	2.6	2.2	2.5	2.6	2.8	2.3	10.1	9.8	10.3
Total Net Generation	680.3	691.4	773.3	678.0	686.3	667.6	743.3	704.1	701.3	719.3	758.1	722.9	2823.0	2801.2	2901.7
Net Imports	2.4	3.5	7.2	6.5	4.7	5.4	8.1	6.8	5.6	6.5	9.1	7.1	19.6	25.0	28.3
Utility Purchases from Nonutilities ^b	29.3	31.9	35.0	29.8	33.4	36.4	39.7	34.0	36.8	40.1	44.0	37.5	126.0	143.5	158.4
Total Supply	711.9	726.8	815.5	714.3	724.4	709.4	791.1	744.9	743.8	765.9	811.2	767.6	2968.6	2969.7	3088.4
Losses and Unaccounted ^c	37.9	65.9	56.6	49.0	41.9	59.3	43.7	61.9	37.6	85.0	48.9	65.0	209.3	206.7	236.5
Demand															
Residential	247.7	214.5	272.4	222.4	246.8	203.8	260.5	230.9	258.2	225.0	267.2	236.1	957.0	942.1	986.5
Commercial	179.9	186.4	213.6	185.0	181.8	183.6	211.4	189.7	189.2	190.4	217.5	196.2	764.9	766.4	793.4
Industrial	223.6	235.6	246.5	235.0	231.2	239.7	250.9	239.1	235.4	242.6	253.1	246.9	940.7	960.8	978.1
Other	22.9	24.5	26.4	22.9	22.8	23.0	24.6	23.3	23.2	22.8	24.5	23.4	96.6	93.6	93.9
Total Demand	674.1	661.0	758.9	665.3	682.5	650.1	747.4	682.9	706.1	680.9	762.3	702.6	2759.3	2763.0	2851.9

^aOther includes generation from wind, wood, waste, and solar sources.

^bElectricity received from nonutility sources, including cogenerators and small power producers.

^cBalancing item, mainly transmission and distribution losses.

Notes: Data for utility purchases from nonutilities, net utility imports, and losses and unaccounted are estimated for 1991. 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 C102092BBB14:56 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); and *Electric Power Monthly*, DOE/EIA-0226(92/09).

Table 14. U.S. Petroleum Supply and Demand: Severe Weather Case
 (Million Barrels per Day, Except Closing Stocks)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Crude Oil Supply															
Domestic Production ^a	7.56	7.41	7.34	7.35	7.35	7.18	7.03	7.16	7.12	6.98	6.93	6.97	7.42	7.18	7.00
Alaska	1.88	1.77	1.76	1.78	1.79	1.71	1.66	1.71	1.66	1.58	1.58	1.62	1.80	1.72	1.61
Lower 48	5.68	5.64	5.58	5.58	5.56	5.47	5.37	5.45	5.46	5.39	5.35	5.35	5.62	5.46	5.39
Net Imports (including SPR) ^b	5.20	5.94	6.04	5.48	5.34	5.97	6.38	6.10	6.14	6.51	6.81	6.38	5.67	5.95	6.46
Gross Imports (excluding SPR)	5.31	6.08	6.14	5.59	5.42	6.04	6.47	6.20	6.26	6.61	6.90	6.48	5.78	6.03	6.57
SPR Imports	-0.19	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	-0.05	0.01	0.00
Exports	0.11	0.14	0.10	0.12	0.08	0.08	0.09	0.10	0.12	0.10	0.09	0.10	0.12	0.09	0.10
Other SPR Supply	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.03	0.00	0.00	0.01	0.02
SPR Stock Withdrawn or Added (-)	0.19	0.00	0.00	0.00	0.00	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	0.05	-0.01	-0.02
Other Stock Withdrawn or Added (-)	-0.16	-0.11	0.07	0.17	-0.15	0.15	-0.03	-0.16	0.00	0.04	-0.02	0.00	-0.01	-0.05	0.01
Product Supplied and Losses	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
Unaccounted-for Crude Oil	0.29	0.27	0.30	0.12	0.32	0.38	0.40	0.44	0.28	0.27	0.35	0.29	0.24	0.39	0.30
Total Crude Oil Supply	12.87	13.50	13.73	13.10	12.84	13.66	13.76	13.52	13.53	13.78	14.05	13.62	13.30	13.45	13.74
Other Supply															
NGL Production	1.67	1.65	1.62	1.69	1.69	1.70	1.64	1.64	1.65	1.63	1.63	1.63	1.67	1.64	
Other Hydrocarbon and Alcohol Inputs	0.09	0.09	0.09	0.10	0.12	0.09	0.11	0.19	0.16	0.09	0.11	0.19	0.09	0.13	0.14
Crude Oil Product Supplied	0.02	0.02	0.01	0.02	0.02	0.01	0.02								
Processing Gain	0.68	0.68	0.74	0.75	0.73	0.78	0.73	0.68	0.68	0.69	0.71	0.69	0.71	0.73	0.69
Net Product Imports ^c	0.48	1.18	1.18	0.97	0.83	0.96	1.20	1.20	0.86	1.48	1.39	1.38	0.96	1.05	1.28
Gross Product Imports ^c	1.56	1.98	1.94	1.88	1.72	1.81	2.01	2.10	1.75	2.33	2.21	2.28	1.84	1.91	2.14
Product Exports	1.07	0.80	0.76	0.90	0.89	0.85	0.81	0.90	0.89	0.85	0.82	0.90	0.88	0.86	0.86
Product Stock Withdrawn or Added (-) ^d	0.66	-0.72	-0.38	0.32	0.68	-0.50	-0.24	0.12	1.08	-0.63	-0.53	0.23	-0.03	0.01	0.03
Total Supply	16.67	16.39	17.01	16.96	16.90	16.70	17.21	17.38	17.98	17.05	17.39	17.76	16.76	17.05	17.54
Demand															
Motor Gasoline	6.83	7.34	7.39	7.17	7.01	7.33	7.46	7.20	7.02	7.36	7.47	7.27	7.19	7.25	7.28
Jet Fuel	1.51	1.38	1.52	1.48	1.41	1.39	1.51	1.51	1.44	1.40	1.55	1.58	1.47	1.46	1.49
Distillate Fuel Oil	3.11	2.79	2.76	3.02	3.21	2.84	2.75	3.18	3.73	3.05	2.86	3.27	2.92	2.99	3.23
Residual Fuel Oil	1.19	1.14	1.14	1.16	1.26	1.03	1.00	1.18	1.42	1.10	1.03	1.21	1.16	1.12	1.19
Other Oils ^e	3.84	3.75	4.18	4.12	3.99	4.12	4.49	4.31	4.36	4.14	4.48	4.42	3.98	4.23	4.35
Total Demand	16.49	16.40	17.00	16.96	16.89	16.70	17.21	17.38	17.98	17.05	17.39	17.76	16.71	17.04	17.54
Total Petroleum Net Imports	5.68	7.12	7.22	6.45	6.16	6.93	7.59	7.30	7.00	7.99	8.20	7.76	6.62	7.00	7.74
Closing Stocks (million barrels)															
Crude Oil (excluding SPR) ^f	337	347	341	325	339	325	328	342	342	338	340	340	325	342	340
Total Motor Gasoline	210	214	216	219	220	225	210	220	219	213	216	216	219	220	216
Finished Motor Gasoline	171	177	178	182	181	188	170	181	179	175	177	182	181	177	177
Blending Components	38	37	39	37	39	37	40	39	40	38	39	39	37	39	39
Jet Fuel	44	48	50	49	44	45	49	49	46	47	47	48	49	49	48
Distillate Fuel Oil	98	114	140	144	98	104	132	135	86	98	127	130	144	135	130
Residual Fuel Oil	43	44	48	50	40	40	46	47	32	36	39	46	50	47	46
Other Oils ^g	257	298	299	262	260	294	294	269	239	284	299	266	269	266	266
Total Stocks (excluding SPR)	989	1065	1094	1048	1001	1033	1058	1061	963	1016	1067	1046	1048	1061	1046
Crude Oil in SPR	568	568	569	569	569	570	571	573	574	576	578	580	569	573	580
Total Stocks (including SPR)	1558	1634	1663	1617	1569	1602	1629	1634	1538	1592	1645	1626	1617	1634	1626

^aIncludes lease condensate.

^bNet imports equals gross imports plus SPR imports minus exports.

^cIncludes finished petroleum products, unfinished oils, gasoline blending components, and natural gas plant liquids for processing.

^dIncludes an estimate of minor product stock change based on monthly data.

^eIncludes 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.

^fIncludes crude oil in transit to refineries.

^gIncludes 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 C101992BB715:29 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Petroleum Supply Annual 1991*, DOE/EIA-0340(91)/1; *Petroleum Supply Monthly*, DOE/EIA-0109(91/01-92/09); and *Weekly Petroleum Status Report*, DOE/EIA-0208(various issues).

Table 15. U.S. Natural Gas Supply and Demand: Severe Weather Case
 (Trillion Cubic Feet)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Total Dry Gas Production ^a	4.57	4.37	4.32	4.68	4.58	4.39	4.44	4.84	4.87	4.64	4.73	4.78	17.94	18.25	19.01
Net Imports	0.42	0.39	0.37	0.46	0.46	0.47	0.43	0.53	0.55	0.50	0.49	0.56	1.64	1.90	2.10
Supplemental Gaseous Fuels	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.12	0.11	0.11
Total New Supply	5.02	4.79	4.71	5.17	5.08	4.89	4.89	5.40	5.45	5.16	5.24	5.37	19.69	20.26	21.22
Underground Working Gas Storage															
Opening	3.07	1.91	2.56	3.20	2.82	1.54	2.15	2.99	2.84	1.42	1.86	2.98	3.07	2.82	2.84
Closing	1.91	2.56	3.20	2.82	1.54	2.15	2.99	2.84	1.42	1.86	2.98	2.68	2.82	2.84	2.68
Net Withdrawals ^b	1.05	-0.70	-0.65	0.39	1.20	-0.61	-0.83	0.15	1.42	-0.44	-1.12	0.30	0.09	-0.09	0.15
Total Supply ^a	6.07	4.10	4.06	5.55	6.27	4.28	4.06	5.56	6.87	4.72	4.12	5.66	19.78	20.17	21.38
Balancing Item ^c	0.04	0.03	-0.22	-0.39	-0.02	0.15	-0.12	-0.38	0.05	0.05	-0.13	-0.38	-0.53	-0.37	-0.41
Total Primary Supply ^a	6.11	4.13	3.84	5.16	6.25	4.43	3.94	5.18	6.93	4.77	3.99	5.28	19.24	19.79	20.97
Demand															
Lease and Plant Fuel	0.32	0.30	0.30	0.33	0.32	0.30	0.31	0.32	0.34	0.31	0.31	0.32	1.25	1.25	1.28
Pipeline Use	0.22	0.15	0.14	0.18	0.22	0.16	0.14	0.17	0.22	0.17	0.15	0.18	0.68	0.69	0.72
Residential	2.09	0.75	0.38	1.35	2.06	0.85	0.43	1.30	2.53	0.99	0.43	1.31	4.57	4.64	5.26
Commercial	1.10	0.50	0.36	0.76	1.08	0.54	0.37	0.73	1.27	0.57	0.35	0.73	2.71	2.71	2.91
Industrial	1.88	1.71	1.74	1.91	2.02	1.85	1.75	1.95	2.00	1.91	1.84	2.03	7.25	7.56	7.79
Electric Utilities	0.51	0.73	0.92	0.63	0.55	0.73	0.95	0.71	0.58	0.82	0.92	0.70	2.79	2.94	3.01
Total Demand	6.11	4.13	3.84	5.16	6.25	4.43	3.94	5.18	6.93	4.77	3.99	5.28	19.24	19.79	20.97

^aExcludes nonhydrocarbon gases removed.

^bNet withdrawals may vary from the difference between opening and closing stocks of gas in working gas storage due to book transfers between base and working gas categories, and other storage operator revisions of working gas inventories.

^cThe balancing item represents the difference between the sum of the components of natural gas supply and the sum of components of natural gas demand.

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 C101992BB715:29 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); *Natural Gas Monthly*, DOE/EIA-0130(92/09); and *Electric Power Monthly*, DOE/EIA-0226(92/09).

Table 16. U.S. Electricity Supply and Demand: Severe Weather Case
 (Billion Kilowatthours)

	1991				1992				1993				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1991	1992	1993
Supply															
Net Utility Generation															
Coal	377.8	367.9	416.7	386.8	386.6	373.4	411.0	399.1	399.0	396.5	410.4	414.2	1549.2	1570.1	1620.1
Petroleum	26.7	30.2	31.5	23.0	27.3	18.7	23.0	24.2	30.6	27.9	29.3	26.6	111.4	93.2	114.5
Natural Gas	48.5	68.4	87.1	60.2	52.2	69.5	88.7	64.7	52.8	74.9	84.4	64.0	264.1	275.1	276.1
Nuclear	151.4	142.6	171.1	147.5	156.5	139.1	159.3	151.3	159.3	139.1	164.6	147.0	612.6	606.2	609.9
Hydroelectric	73.4	80.0	64.4	57.7	61.0	64.4	58.8	63.2	71.1	78.9	66.6	68.9	275.5	247.4	285.5
Geothermal and Other ^a	2.9	3.5	4.1	3.3	2.6	2.5	2.6	2.2	2.5	2.6	2.8	2.3	13.8	9.8	10.3
Total Net Generation	680.3	691.4	773.3	678.0	686.3	667.6	743.3	704.6	715.4	719.9	758.1	722.9	2823.0	2801.8	2916.3
Net Imports															
	2.4	3.5	7.2	6.5	4.7	5.4	8.1	6.8	5.6	6.5	9.1	7.1	19.6	25.0	28.3
Utility Purchases from Nonutilities ^b															
	29.3	31.9	35.0	29.8	33.4	36.4	39.7	34.0	36.8	40.1	44.0	37.5	126.0	143.5	158.4
Total Supply															
	711.9	726.8	815.5	714.3	724.4	709.4	791.1	745.4	757.8	766.5	811.2	767.6	2968.6	2970.3	3103.1
Losses and Unaccounted ^c															
	37.9	65.9	56.6	49.0	41.9	59.3	43.7	62.5	38.7	84.2	48.9	65.0	209.3	207.3	236.7
Demand															
Residential															
	247.7	214.5	272.4	222.4	246.8	203.8	260.5	231.0	269.8	226.3	267.2	236.1	957.0	942.1	999.4
Commercial															
	179.9	186.4	213.6	185.0	181.8	183.6	211.4	189.7	190.7	190.6	217.5	196.2	764.9	766.4	795.1
Industrial															
	223.6	235.6	246.5	235.0	231.2	239.7	250.9	239.1	235.4	242.6	253.1	246.9	940.7	960.8	978.1
Other															
	22.9	24.5	26.4	22.9	22.8	23.0	24.6	23.3	23.2	22.8	24.5	23.4	96.6	93.6	93.9
Total Demand															
	674.1	661.0	758.9	665.3	682.5	650.1	747.4	683.0	719.2	682.4	762.3	702.6	2759.3	2763.0	2866.4

^aOther includes generation from wind, wood, waste, and solar sources.

^bElectricity received from nonutility sources, including cogenerators and small power producers.

^cBalancing item, mainly transmission and distribution losses.

Notes: Data for utility purchases from nonutilities, net utility imports, and losses and unaccounted are estimated for 1991. 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 C101992BB715:29 of the Short-Term Integrated Forecasting System.

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(92/09); and *Electric Power Monthly*, DOE/EIA-0226(92/09).

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