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Third Quarter 1993

Quarterly Projections

Short-Term Energy Outlook

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Domestic crude oil production figures are provided by the EIA Dallas Field Office, under the supervision of John H. Wood. Nuclear electricity generation is provided by Kenneth Wade (202-254-5514); hydroelectric generation, electricity imports, and utility electricity purchases from nonutilities are provided by Robin Reichenbach (202-254-5353); and coal production, imports, and exports are provided by Byung Doo Hong (202-254-5365)—all of the EIA Office of Coal, Nuclear, Electric and Alternate Fuels.

The Energy Information Administration began reporting the series "Motor Gasoline Product Supplied" (adjusted in this report with gasoline demand) on a new basis for monthly data for January 1993 forward. These new-basis data are included in this issue of the Outlook. The reporting data relating to fuel ethanol blended into gasoline as well as certain changes in product classification affecting gasoline reported motor gasoline relative to historical quantities. As a result of these changes, any comparisons in product classification between 1992 and 1993 or 1994 use must recognize the adjustments made in 1993. This Outlook reports all 1992 volumes reflecting original data adjusted data. All reported volume changes or percentage differences between 1992 and 1993 or 1994 use must recognize the adjustments made in 1993. This Outlook reports all 1992 volumes reflecting original data adjusted data so that the data are on a consistent basis for reporting changes. A summary of the changes is provided in Appendix B.

Treatment of Petroleum Monthly Reporting Change

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

Between the data in these publications and the historical data in this Outlook are due to independent rounding.

Published in the Monthly Energy Review, Petroleum Supply Monthly, and other EIA publications, minor discrepancies between the data in these publications and the historical data in this Outlook are due to independent rounding.

Electicity sales and generation are simulated using actual weather data. The historical energy data, electricity sales and generation using the latest exogenous information available (for example, Status Report) or are calculated from model simulations using the latest exogenous information available (for example, Weekly Petroleum Supply and disposition are derived in part from weekly data reported in the Weekly Petroleum Outlook for the second quarter of 1993, however, are preliminary EIA estimates (for example, some monthly values for petroleum supply and disposition are derived from the third quarter through the fourth quarter of 1994. Values for the second quarter of 1993, however, are preliminary EIA estimates (for example, some monthly forecast period for this issue of the Outlook extends from the third quarter of 1993 through the fourth quarter using the Short-Term Integrated Forecasting System (STFS). The STFS model is driven by three sets of assumptions or inputs: estimates of key macroeconomic variables, world oil price assumptions, and assumptions about the severity of weather. Macroeconomic estimates are produced by DRI/McGraw-Hill but are adjusted by EIA to reflect EIA assumptions about the world price of crude oil, energy prices, and other assumptions which may affect the macroeconomic outlook. The EIA model is available on computer tape from the National Technical Information Service.

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

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

Total demand for electricity is expected to increase by 2.9 percent in both 1993 and 1994. The effect of normal weather in 1993 is expected to support growth in total demand. The colder winter and spring this year relative to 1992 gives an added boost to residential electricity growth in 1993. 1993 and 1994. Total electricity demand is expected to be boosted by improved growth in manufacturing production in both forecast years.

Despite the nearly 50 percent decline in drilling since 1985, natural gas production has remained relatively steady due to technological advances in exploration and drilling. However, low drilling activity in the face of rising participation and Canadian imports. Net imports of gas are expected to rise by 14 percent in 1993 and 12 percent in 1994, to 2.1 and 2.4 trillion cubic feet, respectively. Working gas storage levels have risen rapidly since their low end of March levels, underpinning unusually high spot and futures prices. Stocks are expected to be back close to 1991 levels in 1993 and 1994.

Domestic crude oil production is expected to continue its long-term decline, dropping by 4.2 percent in 1993, or about 300,000 barrels per day, and by 2.9 percent in 1994, or about 200,000 barrels per day. In 1993, U.S. crude oil production is expected to slip below 7 million barrels per day, only 4 years after production passed under the 8-million-barrels-per-day mark.

Gasoline demand growth of about 1 percent per year is expected for 1993 to 1994. Based on experience from last winter, supplies should be in excellent shape to meet oxygenated gasoline demand this winter, even though oxygenate stocks are currently below last year's levels at this time. New low-sulfur diesel regulations will begin complicating the supply picture beginning this October and this is expected to add about 4 cents per gallon to diesel fuel costs.

The U.S. economy is expected to grow by 2.7 percent in 1993 and by 3.5 percent in 1994. This growth would push overall energy consumption to new record levels. Petroleum demand would reach 17.5 million barrels per day in 1993 and 17.9 in 1994. Total net imports of petroleum would climb nearly 13 percent in 1993 to 7.8 million barrels per day.

World oil prices are expected to average close to 1992 levels in 1993, as excess world production capacity climbs by over 1.5 million barrels per day this year. World oil stocks, in terms of days of forward supply from usable commercial inventories, are expected to be above 1992 levels at the end of June, indicating little support for near-term price recovery. Under mid-price assumptions, the average price of oil imported into the United States is expected to stay at about \$18 per barrel through the third quarter of 1993, rising to \$19 in the fourth quarter.

Electricity Demand Grows in All Consuming Sectors

Imports and Canadian Storage and Working Gas Reliance on Working Gas for Peak Gas Demand

U.S. Crude Oil Production Stays Below 7.0 Million Barrels per Day in 1993

Second Oxygenated Gasoline Season, Low-Sulfur Diesel Regulations Like Ahead

U.S. Economic Growth Pushes Oil Demand and Imports Up

World Oil Prices Low Given Capacity and Leasing Inventories Climbing, Leaving

Highlights

Natural gas use rose by more than 3.5 trillion cubic feet between 1986 and 1992, an average annual growth rate of 3.6 percent per year. The largest component of demand growth (approximately 2.1 trillion cubic feet) occurred in the industrial sector.⁴

Sources of Supply

US domestic gas production has been maintained at 17.7 to 17.8 trillion cubic feet per year for the past 3 years. However, as consumption expands, it is evident that producers are less able to accommodate rising peak period demand.⁵ In the future, withdrawals from working gas storage and Canadian natural gas imports are expected to play an increasing supply role by offsetting the widening gap between production and consumption during winter months.

Reliance on imports has been rising since 1988, when net imports went over the 1-trillion-cubic-foot-per-year mark.⁶ Net Canadian gas imports in 1993 and 1994 are projected to increase by 14 and 12 percent, respectively (Table 11). The rise in Canadian imports has been made possible by the rapid growth in gas pipeline capacity, and more capacity is planned as the market continues to expand.

Withdrawal from working gas storage during the peak demand months, December through March, is an important element in meeting peak demand. Colder than expected weather in March 1993 reduced working gas storage to unusually low levels (Figure 2). This was due to strong withdrawals in the wake of the blizzard of March 12-13, and the cold weather that lingered for the remainder of the month. Storage levels on April 1 were 25 percent below year-earlier levels.⁷ Demand for summer storage refill underpinned unseasonably high spot and futures gas prices this spring.

As of June 1 the amount of working gas storage—measured as a percentage of working gas capacity—is estimated at 33 percent full, compared with 34 percent one full year ago.⁸ With winter peak demand expected to reach as high as 76 billion cubic feet per day, the

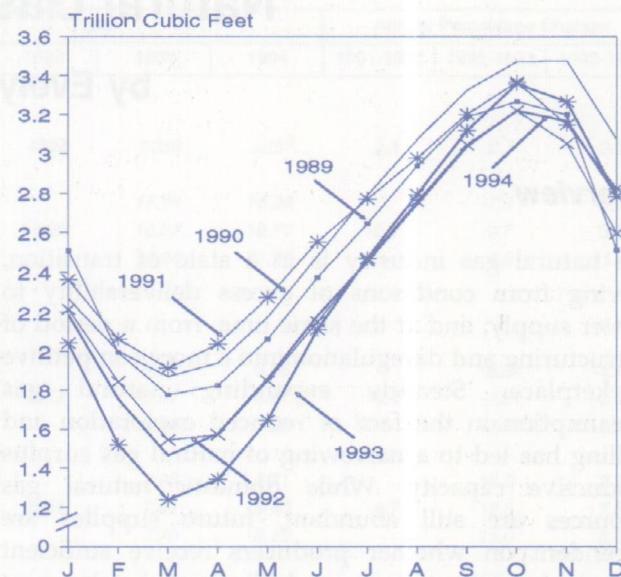


Figure 2. Natural Gas Working Storage, 1989-1994

Sources: History: various issues *Natural Gas Monthly*; Forecast: 3rd quarter Short-Term Integrated Forecasting System database.

industry needs 3.3 trillion cubic feet of working gas storage by November 1 to balance winter supply and demand.⁹ This can be achieved if the current rate of refill is sustained through October.

Meeting Peak Month Demand

In 1993-1994, average U.S. natural gas consumption during the peak months December 1993 through March 1994 is projected to be 67 to 76 billion cubic feet per day. However, average U.S. production during the peak months December 1993 through March 1994 is projected to be 49 to 53 billion cubic feet per day. Thus, an 18 to 23 billion cubic feet per day gap between production and consumption must be filled by imports and withdrawals from storage.

⁴Energy Information Administration, *Natural Gas Monthly*, various issues.

⁵Energy Information Administration, *Natural Gas 1992: Issues and Trends*, DOE/EIA-0560(92).

⁶Energy Information Administration, *Historical Monthly Energy Review, 1973-1988*, DOE/EIA-0035(73-88).

⁷Energy Information Administration estimates, and *Natural Gas Week*, May 19, 1993.

⁸Natural Gas Week, June 21, 1993.

⁹Oil and Gas Journal, April 26, 1993, p. 23.

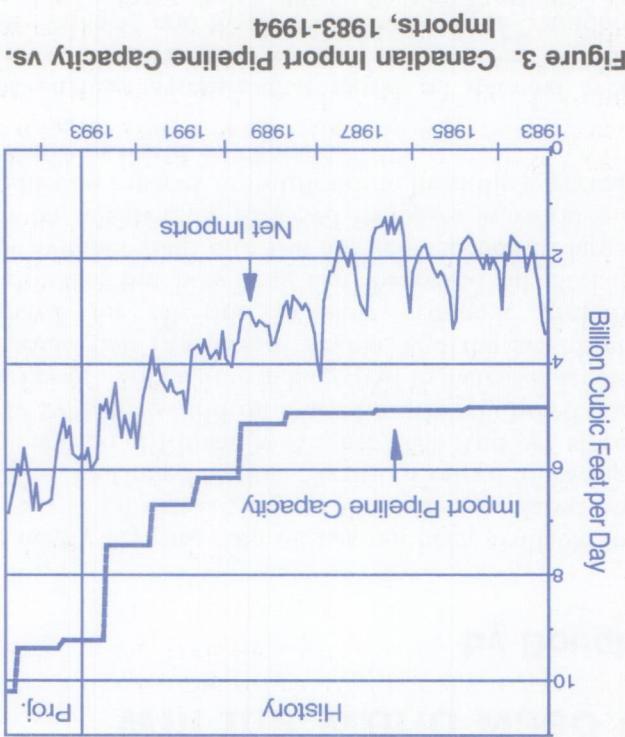
¹¹Energy Information Administration, Office of Oil and Gas, Natural Gas Monthly, December 1991.¹⁰Energy Information Administration, Office of Oil and Gas, Natural Gas Division.^aExcludes nonhydrocarbon gases removed.

	1986	1988	1990	1991	1992	1993	1994
Demand							
Industrial	15.28	17.44	19.23	19.81	20.93	21.18	22.63
Total	44.44	49.26	51.28	52.41	53.96	55.79	57.81
Total Dry Gas Production ^b	44.00	46.73	48.79	48.63	48.57	50.44	51.45
Net Imports	1.89	3.33	3.96	4.50	5.04	5.72	6.45

Selected U.S. Natural Gas Supply and Demand Variables: Mid World Oil Price Case (Billion Cubic Feet per Day)

Table 11. Pipeline Capacity - History 1980-89; National Energy Board and Energy, Mines and Resources, Canada; History and Forecast 1990-94; Energy Information Administration, Office of Oil and Gas, Reserves and Natural Gas Division.

Sources: Net Imports - History; Natural Gas Monthly; various issues; Forecasts



Natural gas supplies available from domestic production, imports and storage should be adequate to fill the Nation's needs during the 1993-94 winter peak months, based on the economic, weather and price assumptions underlying this forecast.

The highest storage withdrawal level on record occurred in December 1989, due to extremely cold weather, when net withdrawals averaged 24.8 billion cubic feet per day for the month.¹¹ The high withdrawals from working gas storage in December 1989 were expected to overburden the system, and would not be experienced during this past winter, net withdrawals experienced during 1993 would be much lower. These levels are to average 12 to 16 billion cubic feet per day. Therefore, net withdrawals from working gas storage in the peak months would therefore have to average 12 to 16 billion cubic feet per day.

States. Resources to substantially increase exports to the United States to meet the projected growth in energy demand will be required. By November 1994, capacity is expected to increase to 10.2 billion cubic feet per day by November 1993. By November 1994, capacity is expected to increase to 10.2 billion cubic feet per day in 1983 to 9.3 billion cubic feet per day per day (Figure 3). Import pipeline capacity has grown from 4.8 billion cubic feet per day in 1983 to 9.3 billion cubic feet per day (Figure 3). Import pipeline capacity has grown from 4.8 billion cubic feet per day in 1983 to 9.3 billion cubic feet per day (Figure 3).

Peak month import levels (December through March 1994) are projected at 5.6 to 6.9 billion cubic feet

Will the World Need Iraqi Oil Anytime Soon?

by Douglas MacIntyre

For nearly 3 years, Iraqi oil has not been available to the world oil market, due to the embargo placed on Iraq by the United Nations Security Council following the invasion of Kuwait in August 1990. And yet, since early 1991, the world oil market has barely noted the absence of Iraqi oil, due in large part to increased levels of production from Saudi Arabia, and the lackluster demand for oil due to slow economic growth worldwide. But how long can the world oil market cope without Iraqi oil? The answer depends in large part on whether the expected increases in world oil production capacity are sufficient to meet the expected increases in world oil demand.

This analysis assumes that world oil demand will increase by 1.4 million barrels per day from 1993 to 1994 (Table 4), and by an annual rate of 1 to 2 million barrels per day from 1994 to 1996.¹ World oil consumption has not increased by as much as 2 million barrels per day since the late 1970's, while an increase of 1 million barrels per day is approximately equal to the increase in world oil consumption expected from 1993 to 1994. Another assumption made is that non-OPEC oil production will remain relatively stable throughout the next few years. Supply increases from areas such as Brazil, Colombia, Yemen, and the North Sea region should roughly counterbalance declines in oil supplies from the United States and the former Soviet Union.

Given these assumptions, implied demand for OPEC production rises approximately 1 million barrels per day in 1994, 1995, and 1996. In 1996, the estimated demand for OPEC oil could exceed 29 to 30 million barrels per day, a level not seen since 1978-1979. In 1978-1979, Iraqi production of 2.5 to 3.5 million barrels per day was available to help meet this demand. Can the estimated demand for OPEC oil in 1996 be met without Iraqi oil? The answer appears to be yes.

OPEC production capacity (excluding Iraq) is expected to increase by 1.3 million barrels per day from 1993 to

1994, followed by an additional increase of 0.6 to 1.5 million barrels per day from 1994 to 1995, and by only 0 to 0.4 million barrels per day from 1995 to 1996 (see enclosed table). Ranges for capacity increases are used from 1994 to 1996 because of uncertainty regarding constraints on OPEC capacity expansion plans. The lower range of these estimates reflects the possibility that expansion plans may be scaled back because of capital constraints, while the higher range reflects planned capacity increases if no significant constraints are encountered. A large part of the increases in OPEC capacity are expected to occur in Kuwait and Saudi Arabia. Other OPEC countries (i.e., Iran, Venezuela, Libya, and the United Arab Emirates) may also increase their production capacity to a lesser extent over the next few years.

Between 1993 and 1996, Saudi Arabia is expected to increase its oil production capacity by a cumulative total of 0.5 to 0.8 million barrels per day. This expansion is expected to come mainly from existing fields as well as new fields which are expected to commence production during the next few years.

The following table summarizes the estimated cumulative increases in OPEC (excluding Iraq) oil production capacity, along with the estimated cumulative increase in world oil demand between 1993 and 1996 (in million barrels per day):

	1994	1995	1996
OPEC Capacity	31.1	31.7 - 32.6	31.7 - 33.0
World Oil Demand	68.7	69.7 - 70.7	70.7 - 72.7
Cumulative Increases from 1993			
OPEC Capacity	1.3	1.9 - 2.8	1.9 - 3.2
World Oil Demand	1.4	2.4 - 3.4	3.4 - 5.4

Source: Energy Information Administration, internal estimates.

¹This range is consistent with the demand projections from the Energy Information Administration, *International Energy Outlook 1993*, DOE/EIA/0484(93). A demand increase of greater than 2 million barrels per day would not be very likely considering that world oil demand has not increased by as much as 2 million barrels per day at an annual rate since the late 1970's.

capacity increases outside of Iraq will be sufficient to supply the world by the end of 1995 (or possibly towards the end of 1994). However, OPEC capacity available by 1996 will be only slightly higher than it is today. This suggests that OPEC will have to increase its capacity by about 1.5 million barrels per day to supply the world by the end of 1996. This would mean that OPEC's capacity would increase from about 27.5 million barrels per day in 1992 to about 29.0 million barrels per day in 1996. It would also mean that OPEC's capacity would increase from about 26.5 million barrels per day in 1993 to about 28.0 million barrels per day in 1996. The OPEC capacity increase will be about 1.5 million barrels per day, or about 5 percent of the world's oil demand.

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from 1992 fourth quarter's growth of 4.6 percent.³ Most of the first quarter's decline in GDP was due to a sharp decrease in defense purchases and an increase in imports. The unusual weather in the first quarter affected the composition of GDP growth—delaying consumer purchases and residential construction. As a result, the economy will grow at higher rates during the latter part of 1993. The two main sources of economic growth over the forecast period will be investment—primarily investment in producer's durable equipment and residential construction—and the recovery in consumption. Investment responded positively to the lower interest rates in 1991 and 1992, and interest rates and inflation are expected to remain relatively flat until the end of 1994.

Non-farm employment gradually accelerates during the economic recovery—growing 1.5 percent in 1993 and 2.4 percent in 1994. Recovery in employment is expected as the number of hours worked in manufacturing are near record levels. In order to satisfy increased demand for output, employers should increase employment.

Trade will not be a near-term source of growth. Exports will remain sluggish as key export markets are softening: Europe's growth will remain weak and Mexico's growth is starting to slow. However, the trade balance will improve slightly in 1994, primarily because of slower import growth as opposed to an increase in exports.

³Macroeconomic forecast based on DRI June 1993 Control, adjusted for STEO world oil prices.

Based on internal EIA calculations, it was estimated that compliance with Phase I of the Clean Air Act requiring low-sulfur coal will cost about \$5.00 per ton of coal or about a 17-percent price increase for the approachable 2.5 percent of coal burned at electric utilities that will be affected by Phase I. In order to meet the January 1, 1995 date of compliance, those utilities will be stockpiling coal by the second half of 1994.

Preliminary estimates compiled by EIA's Office of Energy Markets and End Use, Energy Markets and Compliance Information Division, Energy Information Agency, Technical Guidance: Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, EPA-450/391-022A, November 1991.

⁴Environmental Protection Agency, Technical Guidance: Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, EPA-450/391-022A, November 1991.

⁵Oil production impacts are estimates from the Energy Information Administration, Office of Oil and Gas, Reserves and Natural Gas Division.

⁶Energy Information Agency, Monthly Energy Review, DOE/EIA-0035/92/08, "Demand, Supply, and Price Outlook for Oxygenated Gasoline, Winter 1992-1993" (Washington, DC, August 1992), pp. 5 and 9.

⁷Energy Information Administration, Monthly Energy Review, DOE/EIA-0035/92/08, "Demand, Supply, and Price Outlook for Environmental Protection Agency, Technical Guidance: Stage II Vapor Recovery Systems for Control of Vehicle Refueling Emissions at Gasoline Dispensing Facilities, EPA-450/391-022A, November 1991.

Commentary Date	Description	Impact on Forecast
December 1992	Expiration of Section 29 tax credits for coalbed methane and tight sand formations drilling.	Natural gas drilling declines in 1993 due to a last minute drilling increase in 1992 before expiration of Section 29 credit. ²
November 1992	Oxygenated gasoline required to be sold in carbon monoxide nonattainment areas during November through February of each year.	Motor gasoline prices expected to be 3 to 5 cents per gallon higher in the nonattainment areas, compared to other regions, raising national prices by an average of 1 to 2 cents per gallon through November through February. ¹
January 1993	Alternative Minimum Tax exemption for U.S. oil production. ³	Possible increase of 50,000 barrels per day in U.S. oil production. ³
May 1993	Stage II Gasoline Vapor Recovery System implemented.	0.2 cents per gallon in nonattainment areas.
Autumn 1993	FERC Order 636-A issued.	Average storage levels, reliance on storage levels for peak demand likely to rise, but pricing expected to be more competitive.
October 1993	Removal of sulfur from diesel fuel for on-highway use.	Diesel fuel prices expected to rise by 3 to 4 cents per gallon from the last quarter of 1993 through the fourth quarter of 1994. ⁵
January 1994	Reduced tailpipe emissions of hydrocarbons, carbon monoxide, and nitrogen oxides.	Estimates not yet available.
January 1995	Phase I reformulated gasoline in 9 smoggiest cities (plus opt-in areas).	Approximately 4 to 6 cents per gallon higher cost in affected cities. ⁶
January 1995	Phase I reduction in sulfur dioxide emissions from electric utility steam generation units fired by fossil fuels by a system of tradable allowances.	Coal prices will be about 1 to 2 cents per million ton higher in the latter part of 1994. ⁷

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

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

This growth is calculated based on old-basis numbers for motor gasoline and other products. See Petroleum Supply Monthly, DOE/EIA-0109(93/03), p. xvii, and Appendix B in this report for an explanation of data reports changes.

Heavy oil markets continue to decline in 1993 but are expected to stage a minor comeback by 1994 as natural gas markets tighten and prices increase relative to oil (Tables 5 and 7). Other petroleum products, including feedstocks, and miscellaneous fuels, feedstocks, liquefied petroleum gases (LPG), petrochemicals (Tables 5 and 7). Despite the financial woes of the airline industry, jet fuel is expected to contribute modestly to overall petroleum demand growth in the short term.

Gasoline demand is expected to grow by 1.4 million barrels per day in 1993 and 1.6 million barrels per day in 1994. Despite the recent decline in crude oil prices, gasoline prices are expected to rise 2 percent or more in 1993 and 3.4 percent in 1994 (Table 2). This growth is expected to be offset by a projected decline of 0.5 percent in motor vehicle sales. Motor vehicle sales are projected to decline 1.4 percent in 1993 and 1.6 percent in 1994. The projected decline in motor vehicle sales is expected to be offset by a projected increase in gasoline consumption of 1.4 percent in 1993 and 1.6 percent in 1994.

Although the oil intensity of the U.S. economy is generally declining, even this moderate economic growth path will push petroleum demand back toward the high levels of the late 1970's. By 1994 demand is expected to reach 17.9 million barrels per day (a 15-year high) under base case assumptions.

In 1993, OECD demand for petroleum is expected to grow by 2.7 percent or more in 1993 and 3.4 in 1994 (Table 2). Demand in non-OECD regions, other than the former Soviet Union and Eastern Europe, is expected to accelerate to 2.6 percent as expected.

Despite relatively slow growth in the U.S. economy and generally very mild weather conditions in 1992, growth path will push petroleum demand back toward the high levels of the late 1970's. By 1994 demand is expected to reach 17.9 million barrels per day (a 15-year high) under base case assumptions.

Total non-OECD demand is expected to increase by about 2.5 percent per year, or 430,000 barrels per day, through 1994 in the mid-price case (Tables 1 and 7, and B1 in Appendix B). Weather and economic uncertainties clearly up through 1994.

Demand

Region	1992	1993	1994	
China	2.63	2.82	3.01	
Latin America	5.35	5.48	5.62	
Asia	6.34	6.81	7.36	
Middle East	2.26	3.69	4.02	
Africa	3.87	7.36	4.02	
Total	20.27	21.33	22.48	

Demand in non-OECD regions, other than the former Soviet Union and Eastern Europe, is expected to increase by about 1.6 million barrels per day in 1993, with the increase by about 1.6 million barrels per day in 1994, while the largest increases occurring in Asia, China, and the Middle East. Petroleum demand (in million barrels per day) for other non-OECD regions is as follows:

Soviet Union and Eastern Europe, is expected to increase by 1.15 million barrels per day in 1994, with the overall petroleum demand growth (in million barrels per day) for other non-OECD regions is as follows:

In 1993, OECD demand for petroleum is expected to grow by 2.6 percent as expected.

Demand for petroleum, as discussed in this report, is defined as the sum of petroleum product production (including refinery gain), imports minus exports, and synonymous with "petroleum product supplied," which is defined as the sum of petroleum products supplied by a much larger increase per day in 1993, to 67.3 million barrels per day. This is expected to be followed by a projected decline of 1.4 million barrels per day in 1994 (Table 4). Demand is expected to increase by almost 400,000 barrels per day in 1993, to 67.3 million barrels per day in 1994. The former Soviet Union, as well as by the Republics of the former Soviet Union, is as well as an increase in demand

growth in both regions of Europe.

Outlook for Petroleum

1992 (6.6 percent for the combined category) and are expected to continue to expand along with the economy in the near term (Table 7). One aspect of 1992 LPG growth that may not be repeated this fall was unusually high agricultural demand for propane last fall for crop drying. However, propane demand for heating and petrochemical uses should increase in 1993 and 1994. Petroleum materials for construction (such as asphalt) are expected to benefit as aggregate spending on structures leads domestic investment over the next couple of years, as a result of reduced interest rates.

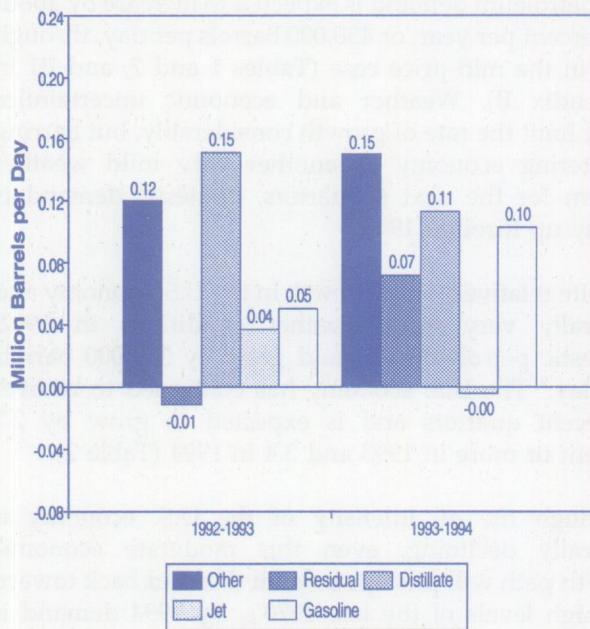


Figure 2. Projected Annual Change in U.S. Petroleum Demand by Fuel

Note: Historical data (including preliminary estimates) through March 1993. These changes are on a consistent basis and cannot be derived from Table 7. Source: Table 7 and Table B1 (for "Gasoline" and "Other").

Supply

World oil production is expected to decrease by over 70,000 barrels per day in 1993 to 66.9 million barrels per day (Table 4). Another large production decline in the former Soviet Union (1.06 million barrels per day) is projected. This is offset by a significant production increase in the Organization of Petroleum Exporting Countries (OPEC) and increases in other non-OECD regions. Oil supply from OECD countries is expected to decline by 150,000 barrels per day in 1993. Production

increases from the North Sea are insufficient to offset production declines in the United States.

World production is expected to increase by about 1.3 million barrels per day next year. An increase in oil production by OPEC accounts for most of this production gain in 1994. Non-OPEC production is expected to fall by only about 80,000 barrels per day, as a decline of 700,000 barrels per day in production from the former Soviet Union will more than offset increases in production from other non-OECD countries. Unlike 1993, however, a production increase from the North Sea will more than offset the production decline from the United States, resulting in an increase of over almost 170,000 barrels per day in OECD oil supply.

Domestic crude oil production is expected to decline by an annual average rate of 300,000 barrels per day in 1993 and by 200,000 barrels per day in 1994 under the mid-price case (Table 7). Barring any quick turnaround toward substantially increased efforts to develop domestic resources, the short- to mid-term outlook for production capacity is not optimistic. Under base case assumptions, the oil production outlook beyond 1994 is for continued annual declines of about 200,000 barrels per day through the year 2000.⁵ Drilling activity approached a 50-year record low in March when the drilling rig count fell to near 600. Since then, rig counts have improved slightly.⁶ Nonetheless, the average rig count for 1993 is expected to be about 3.9 percent below that of 1992. In 1994, the average rig count is expected to increase by only 4.5 percent over that of 1993. Some temporary attenuation of the production decline rate is expected in 1994 because of the expansion of gas-handling facilities in Alaska and new production from the Point McIntyre field.⁷

The potential sensitivities of domestic oil production to price variations are presented in Tables 6 and 8. Domestic crude oil production may range from 80,000 barrels per day below the mid-price case to 70,000 barrels per day above the mid-price case in 1993. In addition, it should be noted that, the lower but quite plausible case in which oil prices average below \$17 through 1994 (Table 5) yields a cumulative oil production decline of more than 710,000 barrels per day between 1992 and 1994 (Table 6), compared to the 500,000 barrels per day in the mid-price case (Table 7). Table 10 provides a disaggregation of the range of oil production expected for the fourth quarter of 1994 between the high and low price cases. The two main

⁵See Energy Information Administration, *Annual Energy Outlook, 1993*, DOE/EIA-0383(93), Table A8.

⁶Baker Hughes Rig Count, *Oil and Gas Journal*, weekly issues spring 1993.

⁷Computed by the Reserves and Natural Gas Division, Energy Information Administration.

The current refinery operating utilization capacity of 96 percent during the week of June 18, 1993 indicates the possibility that crude oil imports may be higher and petroleum product imports lower over the forecast period if higher refining capacity utilization rates are sustainable.

⁸Based on calculations from the Short-Term Integrated Forecasting System database (for net petroleum imports quantities); the Monthly Energy Review, DOE/EIA-0035(93/03) Table 1.6 for historical benchmark mechanistic trade value in petroleum; and the DR/McGraw-Hill CONTROL0393 macroeconomic forecast for the net petroleum imports expenditures divided by nominal GDP.

- Excess production capacity. Excess oil production capacity increased to more than offset increases in actual OPEC capacity increase falls just short of the actual OPEC capacity production in 1994. In 1994, the total OPEC are expected to move than offset increases in actual and capacity additions in Saudi Arabia and Iran remain in force. Capacity restoration in Kuwait capacity from Iraq because it is unavailable for utilization as long as the United Nations sanctions excess (Figure 3). These estimates exclude any decline by about 100,000 barrels per day in 1994 capacity for the world is expected to increase by over 1.6 million barrels per day in 1993, and then decline by about 100,000 barrels per day in 1994.

Two other factors affect the extent to which these uncertainties could influence oil prices:

- Two OPEC countries, Kuwait and Iraq, are in the process of restoring their pre-war production capacity in compliance with OPEC production quota. Large production may be held below restored, although production may be held below capacity and export facilities. Kuwait is expected to increase production and exports as capacity is restored, although production may be held below capacity and export facilities. Future OPEC production remains in effect. Future OPEC production long as the United Nations embargo against quotas. Large production will be constrained as capacity is allowed to resume exports.

In the former Soviet Union, the production and consumption of oil are expected to continue to decline. Export volumes are expected to be maintained to support the need for foreign currency.

- World oil prices are affected by supply, demand, and other factors such as expectations of market participants. Each of these factors is subject to substantial uncertainty. The uncertainties concerning oil supply, however, are centered on oil exports from the former Soviet Union and oil production from OPEC.

World Oil Prices

refinery capacity utilization rates. ⁸Based on calculations from the Short-Term Integrated Forecasting System database (for net petroleum imports quantities); the Monthly Energy Review, DOE/EIA-0035(93/03) Table 1.6 for historical benchmark mechanistic trade value in petroleum; and the DR/McGraw-Hill CONTROL0393 macroeconomic forecast for the net petroleum imports expenditures divided by nominal GDP.

Historical maximum of 2.8 percent.⁸ While import expenditures, as a percent of total petroleum imports, have now approaching record levels, net

declining oil production and rising demand in the United States spells a dramatic increase in imports. Declining oil production and rising demand in the United States base case assumptions, net imports of petroleum will climb by over 21 percent between 1992 and 1994, to 8.4 million barrels per day. This is the highest average annual net import rate since 1977 and the second highest in history, both in absolute terms and as a percent of total petroleum demand (dependence ratio of 47 percent).

Under base case assumptions, net imports of petroleum underly well productivity. Uncertainties relating to the timing of expected maintenance and development operations which affect factors affecting this range are price uncertainty and

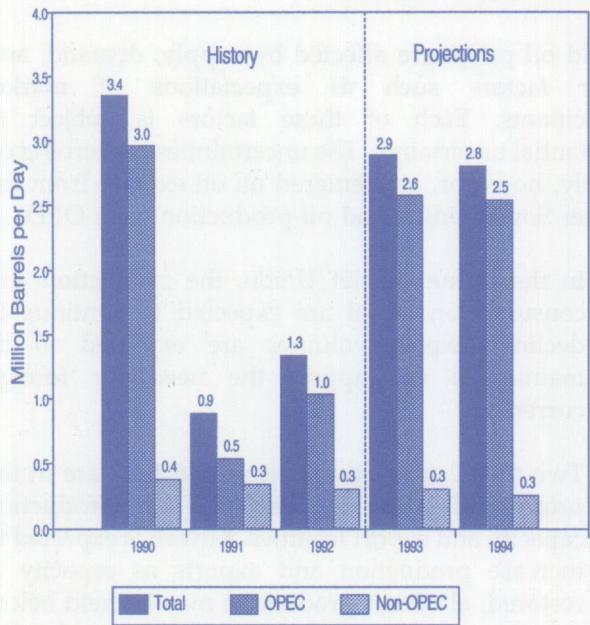


Figure 3. World Excess Oil Production Capacity

Note: Excludes any excess capacity from Iraq in 1991-1994.

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

- Stocks. At the end of the second quarter of 1993, the market economies are expected to have enough stocks readily available to meet petroleum demand for over 30 days (Figure 4), based on anticipated demand levels, about three days more than at the same time in 1992. This represents usable commercial stocks only, and excludes strategic government stocks of 880 million barrels and the minimum inventory levels that must be maintained for normal operations of about 3.1 billion barrels.¹⁰

In 1993, the combination of a significantly higher level of world excess production capacity and a level of readily available stocks similar to or above that in 1992 is possible and could put downward pressure on world oil prices. In 1994, however, if readily available stocks, in terms of days of supply, are lower throughout the year and world excess production capacity drops below year-earlier levels in the second half of the year, then prices could begin to rise moderately.

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. Economic recovery is not expected for the OECD countries as a whole until 1994. 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. The three world oil price cases are meant to represent the range over which prices could vary during the forecast period. In the low-price case, the world oil price is about \$16.80 per barrel in 1993 and \$16.30 per barrel in 1994. In the mid-price case, the price is about \$18.10 per barrel in 1993 and \$18.80 per barrel in 1994. In the high-price case, the world oil price increases to about \$19.10 per barrel in 1993 and to \$21.30 per barrel in 1994. The mid-price case is based on the following assumptions:

- Net oil exports from the former Soviet Union will decrease by less than 50,000 barrels per day in 1993, to 2.0 million barrels per day, and by about 150,000 barrels per day in 1994, as production declines continue to exceed reductions in oil consumption (Table 4).

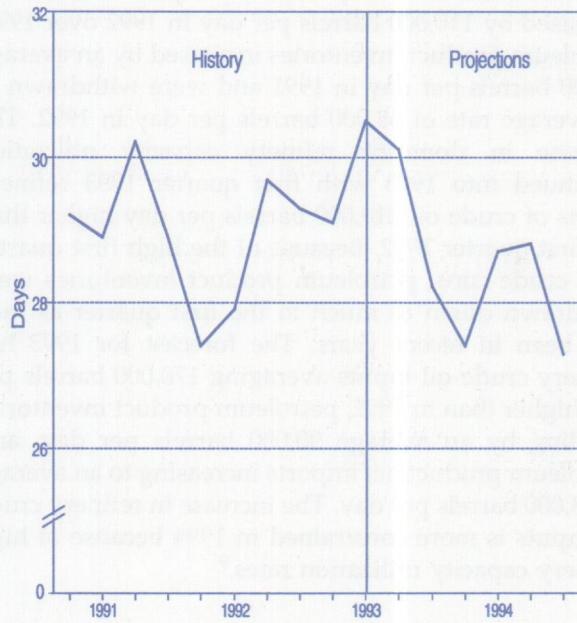


Figure 4. Days Supply of Market Economies Commercial Petroleum Stocks, by Quarter

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.

¹⁰Based on assumptions from EIA's Office of Energy Markets and End Use.

to residual fuel oil in this sector and to a lesser extent, the industrial sector. The average prices of these two fuels consumed at electric utilities is projected to be nearly equal to each other for both 1993 and 1994.

The high-price case assumes a slightly higher rate of inflation a slightly weaker economy than does the mid-price case. In this scenario, prices for petroleum products, natural gas, and coal are projected to gain through 1994.

U.S. Petroleum Demand

Motor Gasoline

Motor gasoline demand is expected to exhibit growth of about 1.0 percent per year from 1992 to 1994 (Figure 5). Continued growth in highway travel averaging 2.5 percent over that period is expected to be the result of continued improvements in the economy (including steady growth in employment and income) and continued reductions in the real cost of fuel per mile driven. Average increases of 1.5 percent in fleet fuel efficiency for 1993 and 1994, while contributing to the lower per-mile costs of driving, primarily offset the upward effect on gasoline demand of the travel growth by reducing per-mile consumption of fuel.¹²

These calculations are based on historical and forecasted information stated on a consistent basis. The Energy Information Administration changed the methodology and coverage for estimating gasoline demand beginning with reports for January 1993 (see Appendix B for details). The fuel efficiency projections reflect the dwindling number of older, less fuel-efficient vehicles remaining to be retired as well as the increasing role of oxygenates, which are expected to moderate improvements in fuel efficiency.

Gasoline producers and marketers are now anticipating their second full winter season under the new oxygenated gasoline regulations, which were promulgated under the Clean Air Act Amendments of 1990, and intended to reduce the level of carbon monoxide in the air. The oxygenated season generally extends from November through February for 39 designated carbon monoxide nonattainment areas. The 1992-1993 oxygenated gasoline season proved to be a success in terms of supplies of the specially formulated

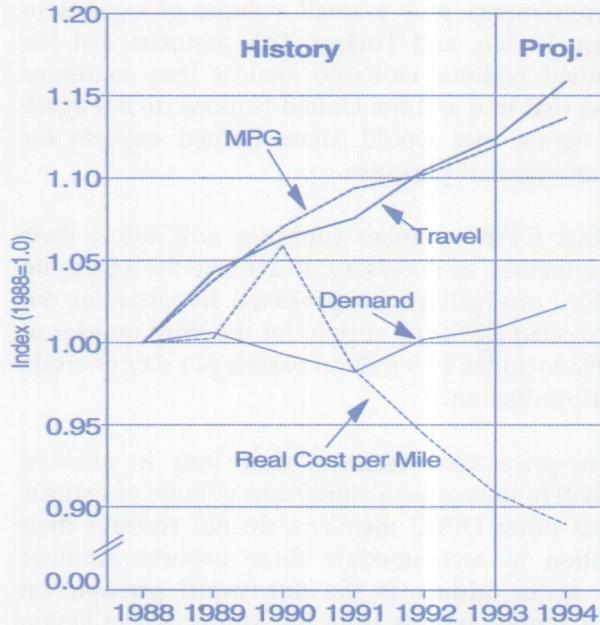


Figure 5. Gasoline Market Trends Indexed to 1988

Note: Indexed values show consistent basis. See Appendix B.

Sources: History: Energy Information Administration, Short-Term Integrated Forecasting System database; Federal Highway Administration, *Traffic Volume Trends*. Projections: Tables 3, 7, and B1.

fuel being provided efficiently by the gasoline distribution system. A review of last season's performance indicates that the supply system worked well, with oxygenated gasoline supplies being efficiently targeted to the nonattainment areas. The Energy Information Administration has released a detailed review of the 1992-1993 oxygenated gasoline season, with the finding that demand for oxygenates needed as blending agents in the production of oxygenated gasoline (principally methyl tertiary butyl ether and ethanol) during the November to February period was about 15 percent below predicted levels.¹³ The main reason for the lower-than-expected oxygenate demand was the successful minimization of "spillover," or excess oxygenated gasoline supply to areas adjacent to nonattainment areas.

Jet Fuel

Jet fuel demand registered a 1.2-percent decline in 1992 (Figure 6). Although some of that decline was related to

¹²Internal calculations based on Short-Term Integrating Forecast System (STIFS) model simulation results.

¹³See Charles Dale, "The Economics of the Clean Air Act Amendments of 1990: Review of the 1992-1993 Oxygenated Motor Gasoline Season," *Petroleum Supply Monthly*, DOE/EIA-0109(93/07), or *Petroleum Marketing Monthly*, DOE/EIA-0380(93/08).

¹⁴Energy Information Administration, Petroleum Supply Monthly, DOE/EIA-0109(93/05), Table S5. Residual fuel oil demand in the first quarter 1993 continued a decline that began in the late 1970's when heavy petroleum fuels began to be displaced by other fuels, including natural gas, coal, and nuclear power.

Residual Fuel Oil

The Clean Air Act Amendments of 1990 established a new, sharply lower standard for the sulfur content of on-highway diesel fuel, to take effect October 1, 1993. The new standard will reduce sulfur emissions by about 8.2 percent of total U.S. petroleum product demand. Higher operating and capital costs required to produce low-sulfur diesel fuel should yield a price premium of 3 to 4 cents per gallon over heating oil and other high-sulfur distillates.¹⁶

Industrial demand is projected to rise 5 percent¹⁵ due to continuing increases in manufacturing production and to greater use of distillate as the natural gas market becomes progressively higher. The new diesel fuel standard applies nationwide and affects about 46 percent of the total domestic demand for distillate fuel oil, or about 8.2 percent of total U.S. petroleum product demand. Higher operating and capital costs required to produce low-sulfur diesel fuel should yield a price premium of 3 to 4 cents per gallon over heating oil and other high-sulfur distillates.¹⁶

Growth in distillate fuel oil demand is expected to be modest in 1992 as a result of milder-than-normal weather in the Northwest boosted deliveries by 7.8 percent. Demand for distillate fuel oil increased by a modest 2 percent in 1993, however, the recovery in first quarter of 1993, despite economic growth, was weaker and more moderate than normal weather in the rest of 1993, continued strong growth in the rest of this year as well as in 1994. For

Distillate Fuel Oil

Aircraft, are expected to result in a slight decline in average aircraft fuel demand growth is projected to average approximately 1 percent for 1993 and 1994. Deliveries in 1994, Demand growth is projected to average 2.4 percent; growth in available capacity is projected to average almost 3 percent, resulting in a slight decline in load factors.

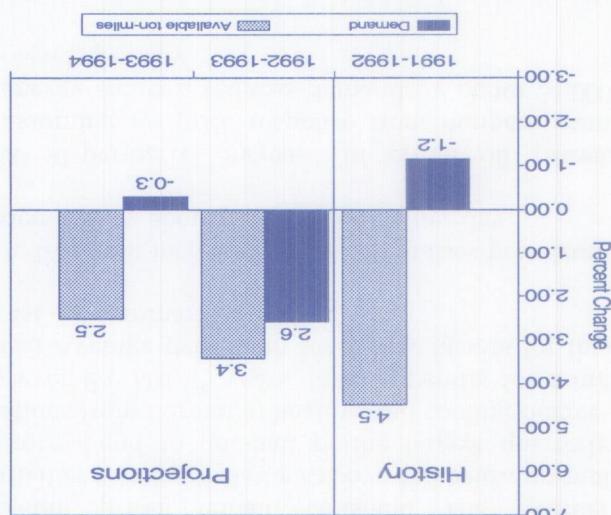
In the first quarter of 1993, jet fuel markets staged a rebound, with both revenue ton-miles and demand increasing 5 percent over the same period last year. Over the forecast period, demand for jet fuel is expected to continue increasing, but growth is not expected to be as brisk as in previous recoveries. In fact, the robust demand growth during the first half of 1993, in combination with projected increases in fuel prices, is expected to be as slow as the second quarter rose almost 3 percent from the same period last year. Available data also indicate that demand for the second quarter rose 5 percent over the same period last year, with both revenue ton-miles and demand increasing 5 percent over the same period last year.

Nonetheless, the industry managed to record a more than 6-percent increase in revenue ton-miles in 1992 than available ton-miles increasing by only 4.5 percent. That resulted in an increase in the average load factor to 55 percent, similar to pre-recession levels.

Despite the steep decline during the first half of 1991, recovery in jet fuel consumption was insufficient to offset the step decline during the first half of 1991. Aggressive marketing by airlines in the form of deep discounts to discretionary travelers, the subsequent aggregation of market share by Peorian-Gulf related activity. Despite from the unusually strong demand in early 1991 economic uncertainty, part of that decrease resulted from the unusual strong demand in early 1991 brought about by Peorian-Gulf related activity. Despite aggressive marketing by airlines in the form of deep discounts to discretionary travelers, the subsequent aggregation of market share by Peorian-Gulf related activity. Despite

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

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



¹⁶Energy Information Administration, Short-Term Energy Outlook, Second Quarter 1993, DOE/EIA-0202(93/3Q) (Washington, DC, May 1993), pp 10-11.

¹⁷Internal calculations based on STES model simulation results.

and by increases in efficiency. First quarter 1993 demand for residual fuel was 15 percent below the same period a year ago. In the base case, residual fuel oil demand is not expected to begin recovering until 1994. Demand in 1994 is forecast to grow 7.4 percent over 1993, as residual fuel begins to recover at the expense of natural gas whose relative price is expected to rise by more than 15 percent.

Most of the decline in residual fuel demand over the last 15 years has been absorbed by a reduction in imports. However, U.S. refiners have also reduced residual fuel production over the last 4 years. Inputs to coking and catalytic hydrocracking units which convert "bottom-of-the-barrel" residual fuels to more valuable lighter products has shown a steady increase over this period.¹⁷ The forecast increase in residual fuel oil demand in 1994 is expected to be supplied by increases in both refinery output and net imports.

Other Petroleum Products

Demand for other petroleum products increased by 6.6 percent in 1992. Higher-than-expected demand for certain miscellaneous products and colder-than-normal weather during the fourth quarter account for much of that strength. In 1993, other petroleum products demand is expected to rise by 2.1 percent, due to continued strength in industrial and petrochemical production. In 1994, continued increases in industrial and petrochemical production are expected to account for much of the 3.2-percent increase in overall demand.

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:¹⁸

- A 1-percent increase in real GDP raises petroleum demand by about 143,000 barrels per day.
- A \$1-per-barrel increase in crude oil prices, assuming no price response from nonpetroleum energy sources, reduces demand by about 34,000 barrels per day.
- A \$1-per-barrel increase in crude oil prices boosts domestic oil supply (crude oil and natural gas liquids production) by 74,000 barrels per day.
- A 1-percent increase in heating degree-days increases demand by about 46,000 barrels per day; a 1-percent increase in cooling degree-days increases petroleum demand by about 20,000 barrels per day.

For 1993, projections of the rate of domestic crude oil production range from 6.79 million barrels per day in the low-price case to 6.94 million barrels per day in the high-price case (Tables 6 and 8). This range increases in 1994, with production rates of 6.4 million barrels per day in the low-price case and 6.86 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 1994, for example, the difference between the low- and high-price case is 450,000 barrels per day.¹⁹ About 33 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 67 percent of this range is attributed to the impact of prices on drilling rates and well maintenance (Table 10).

¹⁷Energy Information Administration, *Petroleum Supply Annual 1992*, DOE/EIA-0340(92)/1 (Washington, DC, May 1993), pp. 21 and 47; and earlier issues.

¹⁸The 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 two quarters of 1993 and all four quarters of 1994.

¹⁹Of this total, the lower 48 States accounted for 370,000 barrels of oil per day. The uncertainty of 110,000 barrels per day for the lower 48 States contains 80,000 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 fourth quarter oil rate and reducing that amount starting with the first quarter of 1993 through the end of 1994. 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 (300,000 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.

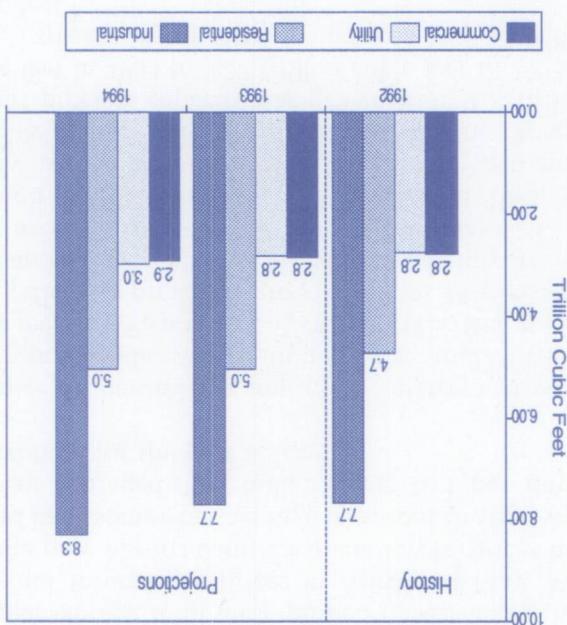
²⁰Energy Information Administration, Natural Gas 1992, Issues and Trends, DOE/EIA-0560(92), March 1993.

²¹Energy Information Administration, Historical Monthly Energy Review 1973-1988, DOE/EIA-0035(73-88); and Monthly Energy Review, April 1993, DOE/EIA-0035(93/04).

reliance on working gas storage and Canadian imports. Increases in peak period demand without increasing uncertainty regarding the ability of producers to meet capacity, particularly since 1991. This has led to some narrowing activity in the gap between production and growing demand has drilling decline in drilling since 1985.²¹ However, low percent decline in growth despite the nearly 50 production has tended to grow despite the nearly 50 percent in 1993, to 18.4 trillion cubic feet. Natural gas production is forecast to increase by 3.5 percent in 1994, to 18.8 trillion cubic feet, and by 2.0 percent in 1995, to 19.0 trillion cubic feet. Total dry gas production is forecast to increase by 3.0 percent to be down for maintenance and refueling.

Sources: History: Energy Information Administration, Natural Gas Monthly (September 1992). Projections: Table 11.

Figure 7. Natural Gas Demand by Sector



Outlook for Other Major Sources

Natural gas demand is projected to grow the fastest in the residential sector in 1993, with a growth rate of 7.0 percent. Residential sector growth is primarily the result of the close-to-normal winter weather in 1993 relative to 1992. Normal weather is again assumed for 1994, so that weather effects will not figure in 1994 demand, which will be flat. In 1994, the industrial and electric utility sectors will lead growth rates of 6.9 and 5.7 percent, respectively. Industrial growth is mainly due to rising manufacturing output and increasing consumption of gas by non-utility electricity generators. Gas use to generate electricity by both electric utility companies to sell electricity by both electric utility companies.

Gas markets is greater efficiency and competition. Gas prices to end users, the expected effect on natural gas prices exist regarding the impact of Order 636 on the economy. Although the 1993-1994 winter heating season, prior to the implementation of FERC Order 636 is to take place on November 1, 1993, which is when all pipelines are expected to have completed their restructuring. Prior to the 1993-1994 winter heating season, gas in the past few years has been supplied by substantial expansion of the interstate pipeline system. From 1992 to 1994, rising consumption levels by sector for illustrates natural gas consumption levels by sector for an increase in gas-fired electricity generation, and economic growth, relatively cold winter weather, and is due to a combination of factors, including stronger cubic feet, the highest level since 1985. Demand growth with prices averaging in excess of \$2.25 per million cubic feet, an additional 9 percent rise is anticipated in 1992. In 1993, an average wellhead price is projected natural gas in 1993 will be 17 percent higher than in 1992. In 1994, an additional 9 percent rise is anticipated natural gas prices. The average wellhead price rising growth in demand will be achieved despite rising

service in the lower 48 States.²⁰ Implementation of Order 636 is to end users, the expected effect on natural gas prices exist regarding the impact of Order 636 on the economy. Although the 1993-1994 winter heating season, prior to the implementation of FERC Order 636 is to take place on November 1, 1993, which is when all pipelines are expected to have completed their restructuring. Prior to the 1993-1994 winter heating season, gas in the past few years has been supplied by substantial expansion of the interstate pipeline system. From 1992 to 1994, rising consumption levels by sector for an increase in gas-fired electricity generation, and economic growth, relatively cold winter weather, and is due to a combination of factors, including stronger cubic feet, the highest level since 1985. Demand growth with prices averaging in excess of \$2.25 per million cubic feet, an additional 9 percent rise is anticipated in 1992. In 1993, an average wellhead price is projected natural gas in 1993 will be 17 percent higher than in 1992. In 1994, an additional 9 percent rise is anticipated natural gas prices. The average wellhead price rising

Total demand for natural gas is expected to continue to grow steadily in 1993 and 1994: by 3.1 percent in 1993, to 20.36 trillion cubic feet, and by 3.6 percent in 1994, to 21.1 trillion cubic feet (Table 11). Demand was 19.75 trillion cubic feet in 1992. Growth in 1993, to 20.36 trillion cubic feet, and by 3.1 percent in 1993, to 21.1 trillion cubic feet (Table 11). Demand was 19.75 trillion cubic feet in 1992.

Natural Gas

Colder-than-expected weather in March 1993 reduced working gas storage to unusually low levels. Storage levels on April 1 were 17 percent below the year ago level, due to strong withdrawals in the wake of the March 12-13 blizzard and the cold weather that lingered for the remainder of the month.²² A scramble for summer storage refill underpinned unseasonably high spot and futures gas prices in April and May. With storage now approaching adequate levels, prices have settled back somewhat. Storage injections the first week of May averaged 11.8 billion cubic feet per day, a record high for the past 8 years.²³

Reliance on natural gas imports, 98 percent of which are from Canada, will continue to rise, to 2.09 trillion cubic feet in 1993 and to 2.35 trillion cubic feet in 1994. This reflects a projected growth rate of 14 percent in 1993 and 12 percent in 1994. Natural gas imports will thus account for over 10 percent of total U.S. gas demand in 1993, and over 11 percent in 1994. The steady rise in imports from Canada has been made possible by the rapid growth in gas pipeline capacity. Import pipeline capacity has grown from 1.77 trillion cubic feet in 1983 to 3.37 trillion cubic feet in 1993. In 1994, capacity is expected to increase to 3.41 trillion cubic feet.²⁴

The Baker-Hughes rig count has been rising steadily through May and June, from 617 on May 7 to 732 on July 2.²⁵ However, this rise is from record low levels set earlier in 1993. Most of the gain in drilling reflects a search for gas. The expectation of continued higher wellhead prices in 1993 and 1994 should provide incentive for increased drilling (Figure 8).

Spot wellhead prices on a monthly basis peaked at \$2.23 per million Btu last October, then fell steadily, bottoming out at \$1.66 per million Btu in February of this year, when warm winter weather lowered demand and eased pressure on prices.²⁶ However, by February, underground storage levels were unusually low. Thus, when cold weather returned in March, spot prices quickly rose to winter-like price levels, reaching \$2.18 cents per million Btu in April. Later, unseasonably hot weather on the East Coast in the latter part of spring caused increases in electric utility demand, resulting in prices rising once more above normal seasonal levels. These short-term counter seasonal movements in price

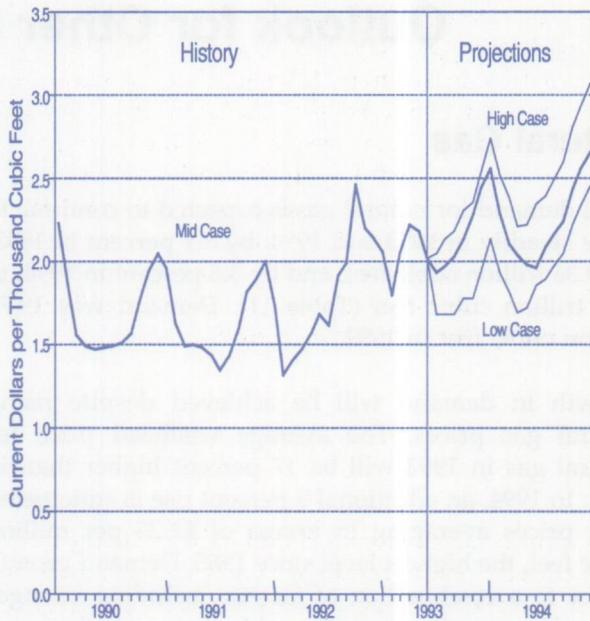


Figure 8. Natural Gas Wellhead Prices

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

appear to indicate a progressive tightening in the short-term relationship between natural gas demand and supply. As a result of this tightening, the average wellhead price for 1993 will be almost 17 percent higher than the 1992 average with most of the difference occurring in the second half of the year. In 1993, large growth in natural gas demand will be satisfied by further increases in domestic supply. Production levels, however, will not keep up with demand growth. The difference will have to be made up by increases (at record levels) of Canadian gas imports and net withdrawals from domestic storage during peak periods.

In 1994, average wellhead prices are projected to increase by an additional 9 percent over 1993 prices. Although slightly rising crude oil prices and continued economic growth will put some upward pressure on natural gas prices, the key reason for wellhead price escalation is declining productive capacity relative to

²²Natural Gas Week, May 19, 1993

²³Natural Gas Week, May 17, 1993.

²⁴Estimates of pipeline export capacity from Bureau of Energy, Mines and Resources, Canada, and Energy Information Administration, Office of Oil and Gas.

²⁵Natural Gas Week, May 24 and July 5, 1993.

²⁶Natural Gas Week, March 1, 1993, page 6.

²⁷Based on Environmental Protection Agency, Clean Air Act Amendments of 1990, "Title IV Acid Deposition Program," pages 1-3, November 1990.

²⁸Energy Information Administration, Natural Gas Productivity Capacity for the Lower 48 States 1982 through 1993, DOE/EIA-0542(93)

²⁹Total coal demand was 888 million tons in 1991 (Energy Productivity Capacity for the Lower 48 States 1982 through 1993, DOE/EIA-0542(93)) and 893 million tons in 1992 (Table 12).

³⁰Environmental Protection Agency, Clean Air Act Acid Deposition Program, "Program Overview," pages 1-3, November 1990.

³¹Based on EIA calculations. It was estimated that compliance with Phase I of the Clean Air Act requiring low sulfur coal will cost about \$5.00 per ton of coal or about a 17 percent price increase for the January 1, 1995 date, those utilities will be stockpiling coal by the second half of 1994.

³²Coal Week, May 3, 1993 and June 14, 1993, page 5.

³³Total coal demand was 888 million tons in 1991 (Energy Productivity Capacity for the Lower 48 States 1982 through 1993, DOE/EIA-0542(93)) and 893 million tons in 1992 (Table 12).

³⁴Energy Information Administration, Natural Gas Productivity Capacity for the Lower 48 States 1982 through 1993, DOE/EIA-0542(93)

The rebound in electricity demand in 1993 will be met by increased output from coal, nuclear and hydroelectric power generation. To a lesser extent, oil will also contribute to meeting incremental growth. Oil-based utility generation is expected to increase by 7.1 percent in 1993 after falling by 30 percent in 1992. In

residential electricity growth in 1993. Total demand for electricity is expected to increase by 2.9 percent in both 1993 and 1994 (Table 13). Midwestern normal-temperatures during most of 1992 (2) resulted in a decrease in demand in all sectors except the industrial sector. The effect of normal weather in 1993 is expected to support growth in all consuming sectors (Figure 9). The colder winter and spring weather this year (compared to 1992) gives an added boost to residential electricity growth in 1993.

Electricity

The United Mine Workers of America (UMWA) strike of selected companies that began on May 10 of this year may be drawn down significantly if the strike lingers. Prices in the East have increased by about \$1 to \$2 dollars per ton. ³²If the strike continues to escalate and lasts throughout the year, U.S. average coal prices to consumers and producers will rise by several cents per million Btu. Consumer and producer stocks of selected companies that began on May 10 of this year may be drawn down significantly if the strike lingers.

Prices in 1993 are expected to remain flat compared to 1992. Prices are causing the price drop have slowed. The factors causing the price drop have also slowed. The rate of decline has slowed over the past few years as some of the affected utilities having coal prices rise by as much as 17 percent. The increase in coal prices will result in higher electricity prices.³³

Electricity demand and industrial output will increase in the next 2 years. Electric utility coal consumption grew by 1.0 percent in 1992 despite weak demand for coal at coke plants, particularly in 1994. Coal demand is expected to produce a somewhat higher demand for coal to produce a somewhat higher demand for steel are expected to decline in 1993 and continue growing at a slower pace by the retail and industrial sectors is expected to grow steadily in 1993 and continue growing at a slower pace in 1994.

Coal prices have fallen since 1986. This is largely the result of the continuing gains in productivity, which includes the closing of non-productive mines, expanded use of longwall mining in underground mines, and the proportion of growth of the cheaper western coal. The

U.S. coal exports are expected to decline in 1993 due to the continuing weaknesses of the European economy, and the continuing subsidies for domestic European coal. Exports are projected to rebound with Europe's economy, and reach 100 million tons in 1994.

In 1993 and 1994, coal demand for coke plants, particularly in 1994. Coal demand is expected to decline to a slow pace by the retail and industrial sectors is expected to grow steadily in 1993 and continue growing at a slower pace by the retail and industrial sectors is expected to grow steadily in 1993 and continue growing at a slower pace in 1994.

Growth in electricity demand and industrial output will be reflected in the domestic production of steel are increases in the domestic production of steel are reflected in the retail and industrial sectors is expected to grow steadily in 1993 and continue growing at a slower pace by the retail and industrial sectors is expected to grow steadily in 1993 and continue growing at a slower pace in 1994.

Gasoline prices and natural gas prices will continue to rise in 1993 and 1994. The price of natural gas will increase in the future should provide incentives for wellhead prices and the expectation of continued price increases in the future. Conversely, higher capacity will continue to drop. Conversely, higher prices, is the principal reason why the production of natural gas began falling in 1992. A decline in drilling over the last several years, caused largely by falling natural gas prices, is the principal reason why the production of natural gas began falling in 1992. The level of capacity was sustained for a specific month and is a function of gas production and drilling.²⁸ The level of capacity was maximum average capacity is defined as the demand.²⁷ Productive capacity is defined as the

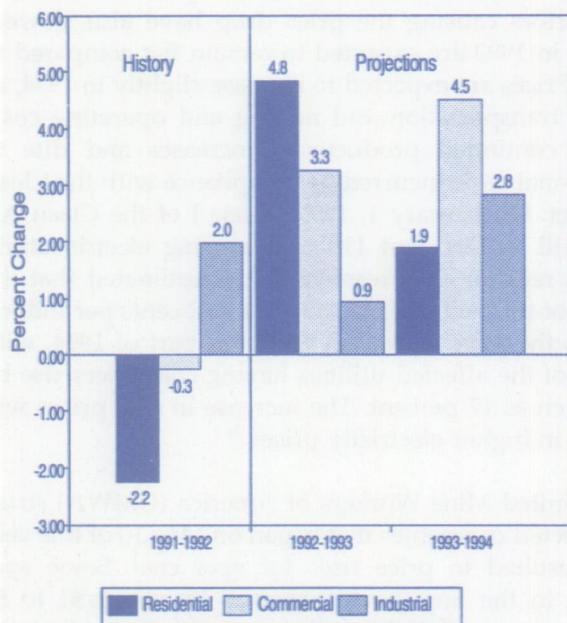


Figure 9. Annual Change in U.S. Electricity Demand by Sector

Source: Table 13.

1994, oil generation will increase by 16.6 percent and gas generation will increase by 4.6 percent. Real residential electricity prices are projected to decrease by an average of 2 percent annually from 1992 through 1994, as the declining cost of capital offsets the expected increase in maintenance and fossil fuel costs (Figure 10).

U.S. utilities are expected to supply about 2.4 percent more electricity in 1993 and 2.8 percent in 1994. Non-utility supply of electricity to electric utilities is expected to grow at an even more rapid rate, rising by 6.5 percent in 1993 and by 6.0 percent in 1994. Net imports of electricity from Canada are also expected to grow.

Hydroelectric power generation is expected to rebound in 1993 almost to 1991 levels due to a return to normal rainfall in the Pacific Northwest, where more than one-half of total U.S. hydroelectric capacity is located. Watersheds have been below normal levels over the past few years, particularly in 1992.³³

Nuclear power generation is expected to increase in 1993 by 2.1 percent. This increase is due to the coming on line of the Comanche Peak 2 nuclear unit in Glen Rose, Texas, and due to improving performance of nuclear plants as a whole. Nuclear generation in 1994 is expected to drop slightly from 1993 levels due to units being off line for maintenance and refueling.

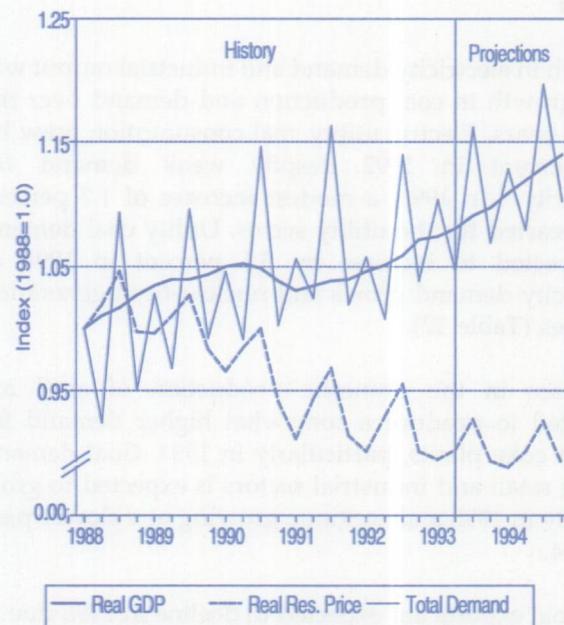


Figure 10. Electricity Indicators

Sources: History: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(90/01) and DOE/EIA-0035(93/06); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, various issues. Projections: Tables 2, 5, and 13.

³³The hydroelectric generation forecast is now being produced by the Short-Term Hydroelectric Generation Model. This model uses an autoregressive integrated moving average (ARIMA) time series model with precipitation as an explanatory variable.

Appendix A

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. 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 1993 (two quarters only) is as follows: $(5132 - 5061) / ((5132 + 5061) / 2)$, or 1.4 percent. For each period, the petroleum demand difference (in million barrels per day) is divided by the percentage difference in GDP. For the last 2 quarters of 1993, the average petroleum demand difference is 154,000 barrels per day; thus, a 1-percent change in GDP corresponds to a change in

demand of $(154,000 / 1.4)$, or 111,000 barrels per day. For 1994, a 3.9-percent change in GDP corresponds to a change in demand of 626,000 barrels per day; thus, a 1-percent change in GDP corresponds to a demand change of 159,000 barrels per day. The average of the 1993 and 1994 results (weighting the 1993 results by 184 days and 1994 by 365 days) is 143,000 barrels per day per 1 percent difference in GDP. Table 9 also shows the differences in petroleum demand due to changes in energy prices caused by varying the world crude oil price. The change in petroleum demand (in million barrels per day) is divided by the change in the crude oil price (in dollars per barrel), and the result is averaged over the 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.

Appendix B

Data Series Adjustments

Beginning with the reporting of January 1993 data, the Energy Information Administration (EIA) has made adjustments to the product supplied series for finished motor gasoline, motor gasoline blending components, and NGLs. It was recognized that motor gasoline statistics published by the EIA through 1992 were underreported because the reporting system was not collecting all fuel ethanol and motor gasoline blending components being blended downstream of the refinery. Details of these changes and the effect they would have had on historical 1992 data reported by the *Petroleum Supply Monthly* were reported in the *Short-Term Energy Outlook Second Quarter 1993*, DOE/EIA-0202(93/2Q) (Washington, DC, May 1993), pp. 27-28.

As a result of these changes, any comparison of 1993 or 1994 motor gasoline forecasts to historical data must recognize the adjustments made in 1993. Historical 1992 data is shown below as the originally reported data series and also as adjusted series which are consistent with current procedures. EIA data publications will continue to report the original unadjusted 1992 volumes. In this *STEO*, all reported 1992 volumes reflect original unadjusted data. All reported volume changes or percentage differences between 1992 and 1993 or 1994 use adjusted 1992 data so that the data are on a consistent basis for reporting changes.

Table B1. U.S. Petroleum Supply and Demand: Mid World Oil Price Case
(Million Barrels per Day, Except Closing Stocks)

	1992				1993				1994				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1992	1993	1994
Supply															
Other Supply															
NGL Production (Original Data Series)	1.69	1.70	1.66	1.74	1.85	1.74	1.64	1.69	1.69	1.62	1.62	1.67	1.70	1.73	1.65
NGL Production (Adjusted Basis)	1.76	1.76	1.83	1.83	1.85	1.74	1.64	1.69	1.69	1.62	1.62	1.67	1.76	1.73	1.65
Total Supply (Original Series)	16.91	16.74	16.98	17.49	17.27	17.10	17.56	17.87	18.01	17.55	17.80	18.21	17.03		
Total Supply (Adjusted Basis)	16.97	16.80	17.04	17.58	17.27	17.10	17.56	17.87	18.01	17.55	17.80	18.21	17.10	17.45	17.89
Demand															
Motor Gasoline (Original Series)	6.99	7.34	7.46	7.28	7.09	7.52	7.64	7.45	7.24	7.60	7.73	7.54	7.27		
Motor Gasoline (Adjusted Basis)	7.07	7.44	7.58	7.41	7.09	7.52	7.64	7.45	7.24	7.60	7.73	7.54	7.37	7.43	7.53
Other Oils (Original Series)	4.03	4.15	4.33	4.43	4.16	4.10	4.53	4.49	4.38	4.30	4.60	4.49	4.24		
Other Oils (Adjusted Basis)	4.02	4.12	4.26	4.40	4.16	4.10	4.53	4.49	4.38	4.30	4.60	4.49	4.20	4.32	4.47
Total Demand (Original Data Series)	16.91	16.74	16.98	17.49	17.27	17.10	17.56	17.87	18.01	17.55	17.80	18.24	17.03		
Total Demand (Adjusted Basis)	16.97	16.80	17.04	17.58	17.27	17.10	17.56	17.87	18.01	17.55	17.80	18.24	17.10	17.45	17.89

Note: Ethanol blending into gasoline is reported as "motor gasoline field production" in the *Petroleum Supply Monthly* and is included in "Other Supply - NGL Production."

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

	1992				1993				1994				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1992	1993	1994
Macroeconomic^a															
Real Fixed Investment (billion 1987 dollars)	681	706	710	733	748	769	789	814	833	857	880	902	708	780	868
Real Exchange Rate (index)	0.977	0.985	0.947	1.009	1.038	1.009	1.021	1.032	1.038	1.045	1.047	1.039	0.980	1.025	1.042
Business Inventory Change (billion 1987 dollars)	-8.7	-6.5	3.9	-14.5	1.4	5.2	7.8	10.4	16.1	19.0	22.1	24.9	-6.5	6.2	20.5
Wholesale Price Index (index, 1980-1984=1.000)	1.159	1.172	1.179	1.178	1.183	1.196	1.199	1.206	1.215	1.219	1.225	1.234	1.172	1.196	1.224
Consumer Price Index (index, 1980-1984=1.000)	1.389	1.399	1.409	1.420	1.433	1.445	1.454	1.465	1.478	1.489	1.499	1.510	1.404	1.449	1.494
Petroleum Product Price Index (index, 1980-1984=1.000)	0.589	0.660	0.681	0.659	0.626	0.664	0.629	0.615	0.673	0.681	0.657	0.640	0.647	0.634	0.663
Non-Farm Employment (millions)	108.13	108.43	108.53	108.67	109.10	109.81	110.39	110.93	111.57	112.26	113.00	113.80	108.44	110.06	112.66
Commercial Employment (millions)	70.73	70.99	71.09	71.31	71.69	72.56	73.16	73.66	74.20	74.79	75.42	76.08	71.03	72.77	75.12
Total Industrial Production (index, 1987=1.000)	1.051	1.063	1.065	1.083	1.097	1.104	1.117	1.128	1.141	1.154	1.165	1.175	1.066	1.112	1.159
Housing Stock (millions)	105.12	105.39	105.62	105.90	106.20	106.50	106.80	107.10	107.40	107.70	108.10	108.40	105.51	106.65	107.90
Miscellaneous															
Gas-Weighted Industrial Production (index, 1987=1.000)	1.065	1.074	1.068	1.087	1.092	1.100	1.114	1.126	1.139	1.151	1.160	1.169	1.074	1.108	1.155
Vehicle Miles Traveled (million miles per day)	5596	6381	6517	5950	5706	6503	6664	6117	5925	6679	6839	6280	6111	6247	6431
Vehicle Fuel Efficiency (index)	19.06	20.69	20.82	19.47	19.16	20.60	20.77	19.55	19.48	20.92	21.08	19.84	20.01	20.02	20.33
Real Vehicle Fuel Cost (index)	4.25	4.12	4.19	4.40	4.27	4.02	4.01	4.25	4.14	3.97	3.96	4.19	4.24	4.14	4.07
Air Travel Capacity (available ton-miles)	315.7	330.3	350.0	335.9	327.7	342.0	359.5	348.0	340.0	350.2	367.4	353.9	333.0	344.3	352.9
Aircraft Utilization (revenue ton-miles)	162.3	180.7	205.2	178.1	170.7	189.6	205.1	183.7	176.2	191.1	207.4	186.3	181.6	187.3	190.2
Aircraft Yield (cents per ton-mile)	14.46	12.55	10.97	13.20	14.47	13.82	12.54	13.45	14.15	13.53	12.39	13.37	12.80	13.57	13.36
Residential Natural Gas Customers (millions)	51.59	51.45	51.13	51.00	51.73	51.67	51.25	51.58	52.40	52.25	51.96	52.39	51.29	51.56	52.25
Commercial Natural Gas Customers (millions)	4.43	4.38	4.31	4.25	4.37	4.37	4.27	4.34	4.49	4.44	4.36	4.47	4.34	4.34	4.44
Raw Steel Production (millions)	23.23	23.43	22.32	22.63	23.62	24.09	24.28	25.32	23.97	25.01	25.25	26.22	91.60	97.31	100.45

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

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

Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(93/03); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, April 1993; 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)*, April 1993. Macroeconomic projections are based on DRI/McGraw-Hill Forecast CONTROL0693.

Table 9. U.S. Petroleum Demand Sensitivities

	1993	1994
	Two Quarters ^a	Four Quarters ^a
Economic Activity		
Gross Domestic Product (billion 1987 dollars)	5,061 - 5,132	5,135 - 5,341
Resulting Change in Petroleum Demand (million barrels per day) ^b 5	0.15	0.63
Energy Prices		
Imported Crude Oil (nominal dollars per barrel) ^c	\$16 - \$20.50	\$16.25 - \$21.25
Resulting Change in Petroleum Demand (million barrels per day) ^b		
Due to Changes in the Crude Oil Price	0.15	0.17
Weather		
Heating Degree Days per day ^d	16.73 - 20.39	20.84 - 24.64
Resulting Change in Petroleum Demand (million barrels per day)	0.46	0.86
Cooling Degree Days per day ^d	7.60 - 9.07	5.51 - 6.53
Resulting Change in Petroleum Demand (million barrels per day) ^b	0.05	0.39

^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	6.81	6.36	0.45	0.15	0.30
Lower 48 States	5.22	4.85	0.37	0.11	0.26
Alaska	1.59	1.51	0.08	0.04	0.04

Note: Components provided are for the fourth quarter 1994 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)**

	1992				1993				1994				Year		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1992	1993	1994
Supply															
Total Dry Gas Production ^a	4.44	4.36	4.34	4.63	4.56	4.57	4.59	4.70	4.75	4.68	4.61	4.75	17.78	18.41	18.78
Net Imports	0.47	0.45	0.44	0.48	0.52	0.51	0.48	0.57	0.60	0.58	0.55	0.63	1.84	2.09	2.35
Supplemental Gaseous Fuels	0.03	0.03	0.03	0.03	0.04	0.03	0.02	0.03	0.03	0.03	0.02	0.03	0.12	0.12	0.11
Total New Supply	4.95	4.84	4.81	5.15	5.11	5.11	5.10	5.30	5.38	5.28	5.18	5.41	19.74	20.62	21.25
Underground Working Gas Storage															
Opening	2.82	1.55	2.15	3.05	2.60	1.23	2.11	3.11	2.76	1.43	2.15	3.09	2.82	2.60	2.76
Closing	1.55	2.15	3.05	2.60	1.23	2.11	3.11	2.76	1.43	2.15	3.09	2.74	2.60	2.76	2.74
Net Withdrawals ^b	1.19	-0.61	-0.88	0.47	1.41	-0.88	-1.00	0.34	1.33	-0.72	-0.94	0.35	0.18	-0.12	0.02
Total Supply ^a	6.14	4.23	3.93	5.62	6.52	4.23	4.10	5.64	6.71	4.56	4.24	5.76	19.92	20.50	21.27
Balancing Item ^c	0.11	0.19	-0.05	-0.42	0.01	0.37	-0.10	-0.41	0.02	0.26	-0.06	-0.38	-0.17	-0.14	-0.17
Total Primary Supply ^a	6.25	4.42	3.88	5.20	6.53	4.60	4.00	5.23	6.73	4.82	4.18	5.37	19.75	20.36	21.10
Demand															
Lease and Plant Fuel	0.29	0.28	0.28	0.30	0.30	0.28	0.28	0.30	0.31	0.30	0.30	0.31	1.15	1.16	1.21
Pipeline Use	0.22	0.16	0.14	0.18	0.23	0.18	0.16	0.19	0.22	0.18	0.16	0.19	0.70	0.76	0.74
Residential	2.06	0.85	0.40	1.40	2.30	0.98	0.43	1.32	2.28	0.97	0.44	1.34	4.70	5.03	5.03
Commercial	1.08	0.54	0.36	0.79	1.19	0.56	0.36	0.77	1.20	0.58	0.36	0.76	2.77	2.88	2.90
Industrial	2.05	1.87	1.80	1.95	1.99	1.89	1.83	2.02	2.18	2.02	1.95	2.10	7.66	7.73	8.26
Electric Utilities	0.55	0.73	0.91	0.58	0.52	0.72	0.93	0.63	0.53	0.78	0.97	0.68	2.77	2.80	2.96
Total Demand	6.25	4.42	3.88	5.20	6.53	4.60	4.00	5.23	6.73	4.82	4.18	5.37	19.75	20.36	21.10

^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 of the Short-Term Integrated Forecasting System.

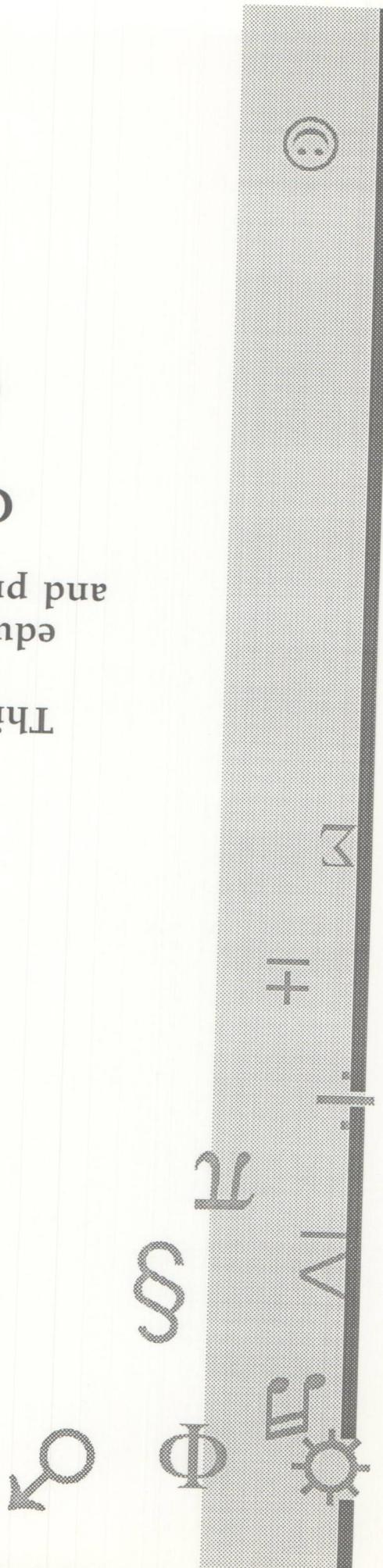
Sources: Historical data: Energy Information Administration, *Monthly Energy Review*, DOE/EIA-0035(93/06); *Natural Gas Monthly*, DOE/EIA-0130(93/06); and *Electric Power Monthly*, DOE/EIA-0226(93/06).

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