

Annual Energy Outlook Forecast Evaluation 2004*

The Office of Integrated Analysis and Forecasting of the Energy Information Administration (EIA) has produced annual evaluations of the accuracy of the *Annual Energy Outlook (AEO)* since 1996. Each year, the forecast evaluation expands on the prior year by adding the projections from the most recent *AEO* and replacing the historical year of data with the most recent. The forecast evaluation examines the accuracy of *AEO* forecasts dating back to *AEO82* by calculating the average absolute percent errors for several of the major variables for *AEO82* through *AEO2004*. (There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the *AEOs*.) The average absolute percent error is the simple mean of the absolute values of the percentage difference between the Reference Case projection and the actual value (also referred to as percent error). The historical data are typically taken from the *Annual Energy Review (AER)*.¹ The last column of Table 1 provides a summary of the most recent average absolute percent errors. The calculation of forecast errors is shown in more detail in Tables 2 through 18. These tables also provide the average absolute error, which is the simple mean of the absolute value of the difference between the Reference Case projection and the actual value.

This *AEO* forecast evaluation changes the basis of measure for comparing dollar denominated values. Gross domestic product (GDP) and energy prices are now evaluated on a nominal dollar basis using the contemporaneous deflator series from each *AEO* rather than a current deflator series. Each *AEO* presents a “real” GDP measure and a matched price index. In past forecast evaluations the calculation of nominal GDP was done by applying the latest official historical series to the “real” GDP forecast to generate a nominal series for the evaluation. This process has been revised to now use the values of the price index from each *AEO* document to inflate the “real” numbers to a nominal series. These revisions also change the energy intensity table, which is now presented as energy consumption divided by nominal dollar GDP. These changes improve the consistency of comparing across *AEOs* in ways discussed in detail below.

The growth in GDP is a good measure of the growth of the aggregate economy over time. However, GDP is but one measure. Other concepts like disposable income growth, industrial output, vehicle sales, expansion of commercial floorspace, to name a few, become the actual drivers to the energy forecast. GDP is perhaps the single best metric to show how the economy grows; and the assessment of how forecasts of GDP compare to history is a good proxy for how economic activity in general influences energy markets.

Table 1 shows the forecast errors from previous and current forecast evaluations. As indicated in Table 1, the forecasts of consumption, production, and carbon dioxide emissions have been relatively accurate, the forecasts of net imports have been moderately accurate, and the forecasts of prices have been the least accurate (although both Table 1 and the individual tables show marked improvement in forecast errors for prices and net imports). The percent errors change from one year’s evaluation to the next as an additional year of data and projections is added. The percent errors may also change because of data revisions in the *AER* and the *Monthly Energy Review (MER)*.

The underlying reasons for deviations between the projections and realized history tend to be the same from one evaluation to the next. The most significant are:

* Contacts: GDP issues, Ronald.Earley@eia.doe.gov; other issues, Crawford.Honeycutt@eia.doe.gov.

¹ GDP and the GDP price deflators come from the Bureau of Economic Analysis, while coal prices to electric generating plants are from the *Monthly Energy Review (MER)*.

- Over the last two decades, there have been changes in laws, policies, and regulations that were not assumed in the projections prior to their implementation because of EIA's statutory requirement to be policy neutral. Many of these actions have had significant impacts on energy supply, demand, and prices. For example, the Powerplant and Industrial Fuel Act (FUA) of 1978 restricted the use of natural gas in power plants and industrial boilers. After FUA was repealed in 1987, use of natural gas for electric generation and industrial processing increased sharply. Consequently, those *AEOs* completed prior to or immediately after repeal of the FUA, e.g., *AEO86*, *AEO87*, and *AEO89*, had considerably larger underestimation of natural gas consumption in 2000 than *AEO90* and all subsequent *AEOs*.
- *AEO85* through *AEO90* forecasts of GDP overestimated GDP growth in the 1990s, whereas *AEO91* and later *AEOs* underestimated GDP growth over that period. The economic slowdown that began in 2001 has led to overestimates of GDP. Because GDP is a good indicator of the economic activity which drives the energy consumption forecasts, those forecasts often have similar error trends as the GDP forecasts (Table 16).
- The level of future electricity sales was underestimated in all years in each of the *AEOs* published between 1994 and 1999 (Table 6). Since about 90 percent of the demand for coal results from electricity generation, the underestimation of electricity sales led to underestimation of coal consumption in those years (Table 5). The forecast errors of electricity sales were particularly large in *AEO94*, *AEO95*, and *AEO96*.
- Overestimation of world oil prices, particularly in earlier *AEO* publications, resulted in overestimation of domestic petroleum production and underestimation of imports. In addition, high world oil price forecasts tended to cause underestimation of actual oil consumption until *AEO2001* when the opposite results are observed (Table 3).
- Natural gas generally has been the fuel with the least accurate forecasts. As regulatory reforms that increased the role of competitive markets were implemented beginning in the mid-1980s, the behavior of natural gas in competitive markets was especially difficult to predict. In the earlier forecasts, EIA's technology improvement expectations proved conservative, as technological advances made petroleum and natural gas less costly to produce. After natural gas curtailments were eased in the mid-1980s, environmental pressures made natural gas an increasingly attractive fuel source, particularly for electricity generation. Historically, natural gas price instability was strongly influenced by natural gas resource estimates, which steadily rose, and by the world oil price, which was subject to its own error. More recently, natural gas consumption has been overestimated (Table 4) due to natural gas price projections that proved to be significantly lower than what occurred (Table 13).
- Technological improvements in both the production and use of energy have had a significant impact on the price, supply, and consumption of energy. For the most part, earlier *AEOs* assumed much slower technology development than actually occurred, accounting for some of the deviation between the forecasts and history. This trend was recognized, in part, by this type of forecast evaluation exercise. Beginning with the *Annual Energy Outlook 1994*, the projections in the *AEO* were produced using the National Energy Modeling System (NEMS). Because NEMS was designed with methodologies to represent technology in a more detailed fashion, there has been an improvement in the capability to represent technological change throughout energy markets. Additional studies on technological improvement have led to more optimistic assumptions in the more recent projections, along with modeling innovations, such as learning-by-doing, in which experience gained with new generation technologies and advanced end-use technologies leads to cost reductions in the model. These enhancements have significantly improved the projection capability within NEMS.

- External factors such as severe weather, economic cycles, and strikes have also had an impact on energy markets; however, these events cannot be anticipated in the mid- to long-term period and are not captured in the models underlying the *AEO* projections.

Revisions to Gross Domestic Product and Implications for the Forecast Comparisons

The concept of GDP is a commonly used measure of economic activity. It can be expressed in nominal dollars or, with the use of a matched price index to remove inflation, in “real” terms. Movements in nominal GDP show how the value of goods and services produced by the United States changes over time, while real GDP is a measure of how the physical production of the economy has grown. While simple in concept, the forecasting of nominal and real GDP and the interpretation of these forecasted measures relative to “history” is not simple or straightforward. The Bureau of Economic Analysis (BEA) within the U.S. Department of Commerce continually adjusts the National Income and Product Accounts data, with comprehensive revisions completed every 4 or 5 years. The last four major revisions (1985, 1991, 1995, and 1999) incorporated definitional and statistical changes, as well as emphasizing new ways of presenting the data.

The changes are not restricted to the nominal series. Concept changes in the derivation of the real GDP also change the perception of economic activity. Prior to 1995, BEA measured real GDP on a fixed-base-year-method. Price deflators for each component of GDP were used to deflate the value of nominal GDP to a base year. While this method allowed total real GDP to be computed by adding the component values (consumption, investment, government, net exports), this reliance on base-year-weighting caused problems. The perception of growth in real GDP using the fixed-weighted approach is dependent on the selection of the base year. In switching the base year from 1982 to 1987, all the growth rates for the respective “real” components changed. A solution is to convert to a chain-weighted measure that eliminates the problem of historical growth rates changing when the base year is updated.² If this approach is followed, however, the component pieces of GDP do not add to the total GDP.

Following the BEA, the *AEO* forecasts prior to *AEO1997* used a fixed-weight base year GDP with several different base years. Beginning with the *AEO1997* forecast, the *AEO* forecast has been completed using chain-weighted dollars. Any forecast evaluation therefore must acknowledge that the forecasts were based on historical data, *as it appeared at the time the forecasts were prepared*. The problem is, there is only one set of historical values available now – the BEA series on nominal GDP and real GDP expressed in 2000 chain-weighted dollars. What should be the basis of comparison of forecast error – nominal or real?

Each *AEO* shows the price deflator (fixed-weighted or chained) and the real GDP series (also fixed-weighted or chained). A simple multiplication yields the nominal GDP series. While the transformation is simple, there is the difficulty associated with the gap in the data where BEA has added more nominal GDP to the history. Since the GDP forecast cannot anticipate such changes, it will be incorrect from the start [this is the option reflected in this evaluation.] On the real side, each *AEO* reports real GDP, but some are in fixed-weighted dollars with varying base years, and since 1997, some use a chain-weighting method. Again, there exists only one true history – the BEA chained-weighted 2000 dollar concept. Lack of available data from old *AEOs* precludes moving the old fixed-weighted real GDP into a chain-weighted concept. The alternative of viewing history from a fixed-weighted perspective is not viable because BEA does not maintain these series in that form. And even if the conversions issues did not exist, the real GDP measure would still contain the gap in the nominal series due to data revisions.

² “Chained-Dollar Indexes: issues, Tips on Their Use, and Upcoming Changes,,” J. Steven Landefeld, Brent R. Moulton, and Cindy M. Vojtech, *Survey of Current Business*, Bureau of Economic Analysis, November 2003. <http://www.bea.gov/bea/ARTICLES/2003/11November/1103%20Chain-dollar.pdf>

Annual Energy Outlook Forecast Evaluation

Table 1. Comparison of Absolute Percent Errors for Present and Current AEO Forecast Evaluations

Average Absolute Percent Error						
Variable	AEO82 to AEO99	AEO82 to AEO2000	AEO82 to AEO2001	AEO82 to AEO2002	AEO82 to AEO2003	AEO82 to AEO2004
Consumption						
Total Energy Consumption	1.9	2.0	2.1	2.1	2.1	2.1
Total Petroleum Consumption	2.9	3.0	3.1	3.1	3.0	2.9
Total Natural Gas Consumption	7.3	7.1	7.1	6.7	6.4	6.5
Total Coal Consumption	3.1	3.3	3.5	3.6	3.7	3.8
Total Electricity Sales	1.9	2.0	2.3	2.3	2.3	2.4
Production						
Crude Oil Production	4.5	4.5	4.5	4.5	4.6	4.7
Natural Gas Production	4.7	4.6	4.6	4.4	4.5	4.6
Coal Production	3.6	3.5	3.8	3.7	3.8	4.1
Imports and Exports						
Net Petroleum Imports	8.8	8.3	7.7	7.4	7.3	7.2
Net Natural Gas Imports	16.0	15.9	16.1	15.8	15.4	15.2
Prices, Economic, and Environmental Variables						
World Oil Prices	68.5	68.4	65.5	62.4	59.3	56.4
Natural Gas Wellhead Prices	84.9	82.6	78.8	74.5	70.6	67.7
Coal Prices to Electric Generating Plants	45.1	46.5	49.8	49.1	48.4	47.8
Average Electricity Prices	17.7	18.6	20.1	19.8	19.6	19.6
Gross Domestic Product**	5.6	5.7	5.9	5.8	5.6	5.5
Total Carbon Dioxide Emissions	N/A	2.3	2.6	2.5	2.6	2.6
Energy Intensity**	5.7	5.8	6.1	6.0	5.8	5.7
<i>AEO - Annual Energy Outlook</i>						
Source: Statistics in Table 1 are a summary of the calculations in Tables 2 through 18. The data in Tables 2 through 18 are based on the 1982						
Note: Projections of carbon dioxide emissions began in AEO93 and were first evaluated in 2000. Evaluation of energy intensity projections began						
*Coal prices to electric generating plants are not published in the <i>Annual Energy Review</i> . The projection comparisons for 2003 use the <i>Monthly</i>						
<i>Energy Review</i> totals for 2002. Beginning in AEO2003, EIA electric generating forecasts incorporated combined heat and power (CHP) electricity						
generation in electricity generating plants. Prior to AEO2003, coal price forecasts reflected data collected, estimated, and reported to electric						
utilities and excluded CHP power generation. <i>AER/MER 2001</i> publications reflect these reporting changes.						

Table 2. Total Energy Consumption, Actual vs. Forecasts

(quadrillion Btu)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	79.1	79.6	79.9	80.8	82.0	83.3													
AEO 1983	78.0	79.5	81.0	82.4	83.8	84.6					89.5								
AEO 1984	78.5	79.4	81.2	83.1	85.0	86.4					93.5								
AEO 1985	77.6	78.5	79.8	81.2	82.6	83.3	84.2	85.2	85.9	86.7	87.7								
AEO 1986		77.0	78.8	79.8	80.6	81.5	82.9	84.0	84.8	85.7	86.5	87.9	88.4	87.8	88.7	89.6			
AEO 1987			78.9	80.0	81.9	82.8	83.9	85.3	86.4	87.5	88.4					91.9			
AEO 1989*				82.2	83.7	84.5	85.4	86.4	87.3	88.2	89.2	90.8	91.4	90.9	91.7	92.9			
AEO 1990					84.2	85.4					91.9					97.4			
AEO 1991						84.4	85.0	86.0	87.0	87.9	89.1	90.4	91.8	93.1	94.3	95.6	97.1	98.4	99.4
AEO 1992							84.7	87.0	88.0	89.2	90.5	91.4	92.4	93.4	94.5	95.6	96.9	98.0	99.0
AEO 1993								87.0	88.3	89.8	91.4	92.7	94.0	95.3	96.3	97.5	98.6	99.7	100.7
AEO 1994									88.0	89.5	90.7	91.7	92.7	93.6	94.6	95.7	96.7	97.7	98.9
AEO 1995										89.2	90.0	90.6	91.9	93.0	93.8	94.6	95.3	96.2	97.2
AEO 1996											90.6	91.3	92.5	93.5	94.3	95.1	95.9	96.9	98.0
AEO 1997												92.6	93.6	95.1	96.6	97.9	98.8	99.9	101.2
AEO 1998													94.7	96.7	98.6	99.8	101.3	102.4	103.4
AEO 1999														94.6	97.0	99.2	100.9	102.0	102.9
AEO 2000															96.4	98.2	99.4	100.9	102.4
AEO 2001																97.6	99.9	102.2	104.1
AEO 2002																	98.3	101.0	104.1
AEO 2003																		97.5	99.9
AEO 2004																			98.1
Actual	76.5	76.8	79.2	82.8	85.0	84.7	84.6	85.9	87.6	89.2	91.2	94.2	94.7	95.1	96.8	98.9	96.4	98.0	98.2
Average Absolute Error (All AEOs)	1.8	2.0	1.0	1.6	2.0	1.2	0.7	0.9	1.0	1.3	1.8	3.2	2.4	2.1	2.4	3.2	2.1	2.0	2.7
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	3.4	3.7	0.9	-2.5	-3.5	-1.6													
AEO 1983	2.0	3.5	2.2	-0.5	-1.4	-0.1					-1.9								
AEO 1984	2.6	3.4	2.5	0.3	0.1	2.0					2.5								
AEO 1985	1.4	2.2	0.7	-2.0	-2.8	-1.6	-0.5	-0.9	-1.9	-2.9	-3.9								
AEO 1986		0.3	-0.5	-3.7	-5.1	-3.7	-2.0	-2.3	-3.2	-4.0	-5.2	-6.7	-6.7	-7.7	-8.3	-9.4			
AEO 1987			-0.4	-3.4	-3.6	-2.2	-0.8	-0.8	-1.3	-2.0	-3.1					-7.1			
AEO 1989*				-0.8	-1.5	-0.2	1.0	0.5	-0.3	-1.2	-2.2	-3.6	-3.5	-4.5	-5.2	-6.1			
AEO 1990					-0.9	0.9					0.7					-1.5			
AEO 1991						-0.3	0.4	0.1	-0.7	-1.5	-2.4	-4.1	-3.1	-2.2	-2.6	-3.3	0.7	0.3	1.3
AEO 1992							0.2	1.3	0.4	-0.1	-0.8	-3.0	-2.4	-1.8	-2.4	-3.3	0.5	0.0	0.9
AEO 1993								1.3	0.8	0.6	0.2	-1.6	-0.8	0.1	-0.4	-1.5	2.3	1.7	2.6
AEO 1994									0.5	0.3	-0.5	-2.6	-2.1	-1.6	-2.3	-3.2	0.3	-0.3	0.7
AEO 1995										0.0	-1.4	-3.9	-3.0	-2.3	-3.0	-4.3	-1.1	-1.9	-1.0
AEO 1996											-0.7	-3.1	-2.3	-1.8	-2.6	-3.9	-0.5	-1.1	-0.2
AEO 1997												-1.7	-1.2	0.0	-0.2	-1.1	2.5	1.9	3.1
AEO 1998													0.0	1.6	1.9	0.9	5.1	4.5	5.3
AEO 1999														-0.5	0.2	0.3	4.7	4.0	4.8
AEO 2000															-0.4	-0.8	3.1	2.9	4.4
AEO 2001																-1.3	3.7	4.2	6.0
AEO 2002																	2.0	3.0	6.0
AEO 2003																		-0.5	1.8
AEO 2004																			-0.1
Average Absolute Percent Error (All AEOs)	2.4	2.6	1.2	1.9	2.3	1.4	0.8	1.0	1.1	1.4	2.0	3.4	2.5	2.2	2.5	3.2	2.2	2.0	2.7

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions.

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 1.3.

Table 3. Total Petroleum Consumption, Actual vs. Forecasts

(million barrels per day)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	18.00	17.89	17.55	17.24	16.98	16.99													
AEO 1983	15.82	16.13	16.37	16.50	16.56	16.63					17.37								
AEO 1984	15.77	15.76	16.01	16.27	16.48	16.74					18.00								
AEO 1985	15.72	15.74	15.97	16.01	16.06	16.08	16.18	16.23	16.32	16.36	16.53								
AEO 1986		16.07	16.29	16.05	16.07	16.15	16.31	16.37	16.42	16.44	16.46	16.50	16.64	16.80	17.21	17.38			
AEO 1987			16.52	16.66	16.96	17.06	17.29	17.56	17.73	17.76	17.72					18.30			
AEO 1989*				17.01	17.20	17.44	17.57	17.72	17.76	17.78	17.82	18.05	18.12	18.19	18.40	18.61			
AEO 1990					17.24	17.41					18.21					18.84			
AEO 1991						16.95	16.65	16.83	17.01	17.17	17.34	17.53	17.83	18.09	18.33	18.53	18.87	19.12	19.24
AEO 1992							16.74	17.07	17.37	17.59	17.80	17.86	17.99	18.14	18.26	18.43	18.70	18.90	19.09
AEO 1993								17.07	17.45	17.79	18.15	18.26	18.60	18.88	19.07	19.25	19.54	19.75	19.98
AEO 1994									17.67	17.99	18.20	18.42	18.66	18.85	19.06	19.34	19.52	19.74	19.99
AEO 1995										17.53	17.93	17.96	18.29	18.48	18.69	18.87	19.08	19.31	19.58
AEO 1996											17.78	17.88	18.10	18.38	18.58	18.78	19.02	19.20	19.41
AEO 1997												18.18	18.34	18.70	19.05	19.38	19.68	19.91	20.19
AEO 1998													18.89	18.92	19.36	19.62	19.94	20.27	20.52
AEO 1999														18.86	19.20	19.91	20.23	20.47	20.65
AEO 2000															19.33	19.56	19.91	20.17	20.42
AEO 2001																19.50	20.04	20.36	20.62
AEO 2002																	19.69	20.84	20.55
AEO 2003																		19.57	19.83
AEO 2004																			19.89
Actual	15.73	16.28	16.67	17.33	17.33	16.99	16.71	17.08	17.24	17.72	17.72	18.36	18.62	18.92	19.52	19.76	19.65	19.76	20.04
Average Absolute Error (All AEOs)	0.60	0.61	0.51	0.80	0.63	0.37	0.41	0.42	0.47	0.44	0.41	0.52	0.54	0.53	0.81	0.82	0.40	0.48	0.43
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	14.5	9.9	5.3	-0.5	-2.0	0.0													
AEO 1983	0.6	-0.9	-1.8	-4.8	-4.4	-2.1					-2.0								
AEO 1984	0.3	-3.2	-3.9	-6.1	-4.9	-1.5					1.6								
AEO 1985	0.0	-3.3	-4.2	-7.6	-7.3	-5.3	-3.2	-5.0	-5.3	-7.7	-6.7								
AEO 1986		-1.3	-2.3	-7.4	-7.2	-4.9	-2.4	-4.2	-4.7	-7.2	-7.1	-10.1	-10.6	-11.2	-11.8	-12.0			
AEO 1987			-0.9	-3.9	-2.1	0.4	3.4	2.8	2.9	0.2	0.0					-7.4			
AEO 1989*				-1.9	-0.7	2.7	5.1	3.7	3.0	0.3	0.5	-1.7	-2.7	-3.8	-5.7	-5.8			
AEO 1990					-0.5	2.5					2.7					-4.6			
AEO 1991						-0.2	-0.4	-1.5	-1.3	-3.1	-2.2	-4.5	-4.2	-4.4	-6.1	-6.2	-4.0	-3.2	-4.0
AEO 1992							0.2	-0.1	0.8	-0.7	0.4	-2.7	-3.4	-4.1	-6.5	-6.7	-4.8	-4.4	-4.8
AEO 1993								-0.1	1.2	0.4	2.4	-0.5	-0.1	-0.2	-2.3	-2.6	-0.6	-0.1	-0.3
AEO 1994									2.5	1.5	2.7	0.3	0.2	-0.4	-2.4	-2.1	-0.7	-0.1	-0.3
AEO 1995										-1.1	1.2	-2.2	-1.8	-2.3	-4.2	-4.5	-2.9	-2.3	-2.3
AEO 1996											0.3	-2.6	-2.8	-2.8	-4.8	-4.9	-3.2	-2.8	-3.2
AEO 1997												-1.0	-1.5	-1.1	-2.4	-1.9	0.2	0.8	0.7
AEO 1998													1.4	0.0	-0.8	-0.7	1.5	2.6	2.4
AEO 1999														-0.3	-1.6	0.8	3.0	3.6	3.0
AEO 2000															-1.0	-1.0	1.3	2.1	1.9
AEO 2001																-1.3	2.0	3.0	2.9
AEO 2002																	0.2	5.4	2.5
AEO 2003																		-1.0	-1.1
AEO 2004																			-0.8
Average Absolute Percent Error (All AEOs)	3.8	3.7	3.1	4.6	3.6	2.2	2.5	2.5	2.7	2.5	2.3	2.9	2.9	2.8	4.1	4.2	2.0	2.4	2.2

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 5.1

Table 4. Total Natural Gas Consumption, Actual vs. Forecasts

(trillion cubic feet)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	15.93	15.72	15.72	16.08	16.59	17.08													
AEO 1983	17.75	17.63	17.57	17.75	17.76	17.77					16.95								
AEO 1984	18.22	18.07	18.33	18.61	18.73	18.76					18.75								
AEO 1985	17.79	17.80	17.89	18.30	18.58	18.71	18.79	18.88	18.82	18.82	18.81								
AEO 1986		16.52	16.83	17.35	17.27	17.50	17.77	17.77	17.90	18.01	18.04	18.03	18.26	18.34	18.04	17.92			
AEO 1987			16.85	16.93	17.24	17.27	17.34	17.43	17.66	18.02	18.31					19.65			
AEO 1989*				17.75	17.95	17.94	18.08	18.10	18.34	18.68	18.94	19.17	19.55	19.86	19.98	20.29			
AEO 1990					18.34	18.66					20.69					22.88			
AEO 1991						18.53	19.21	19.34	19.56	19.76	20.01	20.21	20.66	20.93	21.23	21.64	22.03	22.33	22.35
AEO 1992							18.79	19.36	19.84	20.08	20.53	20.68	21.12	21.42	21.66	21.89	22.23	22.59	22.82
AEO 1993								20.27	20.17	20.54	20.97	21.54	21.83	22.20	22.57	22.83	23.14	23.44	23.75
AEO 1994									19.87	20.21	20.64	20.99	21.20	21.42	21.60	21.99	22.37	22.63	22.95
AEO 1995										20.82	20.66	20.85	21.21	21.65	21.95	22.12	22.25	22.43	22.62
AEO 1996											21.32	21.64	22.11	22.21	22.26	22.34	22.46	22.74	23.14
AEO 1997												22.15	22.75	23.24	23.64	23.86	24.13	24.65	25.34
AEO 1998													21.84	23.03	23.84	24.08	24.44	24.81	25.33
AEO 1999														21.35	22.36	22.54	23.18	23.65	24.17
AEO 2000															21.46	22.36	22.19	22.42	22.92
AEO 2001																22.00	22.67	23.55	24.37
AEO 2002																	22.22	23.89	24.73
AEO 2003																		23.20	24.00
AEO 2004																			22.09
Actual	17.28	16.22	17.21	18.03	19.12	19.17	19.56	20.23	20.79	21.25	22.21	22.61	22.74	22.25	22.41	23.33	22.24	23.02	21.89
Average Absolute Error (All AEOs)	0.8	1.1	0.7	0.7	1.3	1.1	1.2	1.5	1.8	1.8	2.6	2.0	1.7	1.1	1.2	1.6	0.6	0.7	1.7
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	-7.8	-3.1	-8.7	-10.8	-13.2	-10.9													
AEO 1983	2.7	8.7	2.1	-1.6	-7.1	-7.3					-23.7								
AEO 1984	5.4	11.4	6.5	3.2	-2.0	-2.2					-15.6								
AEO 1985	2.9	9.7	3.9	1.5	-2.8	-2.4	-3.9	-6.7	-9.5	-11.4	-15.3								
AEO 1986		1.8	-2.2	-3.8	-9.7	-8.7	-9.2	-12.2	-13.9	-15.2	-18.8	-20.3	-19.7	-17.6	-19.5	-23.2			
AEO 1987			-2.1	-6.1	-9.8	-9.9	-11.4	-13.8	-15.1	-15.2	-17.5					-15.8			
AEO 1989*				-1.6	-6.1	-6.4	-7.6	-10.5	-11.8	-12.1	-14.7	-15.2	-14.0	-10.7	-10.8	-13.0			
AEO 1990					-4.1	-2.7					-6.8					-1.9			
AEO 1991						-3.4	-1.8	-4.4	-5.9	-7.0	-9.9	-10.6	-9.1	-5.9	-5.2	-7.3	-0.9	-3.0	2.1
AEO 1992							-3.9	-4.3	-4.6	-5.5	-7.6	-8.5	-7.1	-3.7	-3.3	-6.2	0.0	-1.9	4.2
AEO 1993								0.2	-3.0	-3.3	-5.6	-4.7	-4.0	-0.2	0.7	-2.2	4.1	1.8	8.5
AEO 1994									-4.4	-4.9	-7.1	-7.2	-6.8	-3.7	-3.6	-5.8	0.6	-1.7	4.8
AEO 1995										-2.0	-7.0	-7.8	-6.7	-2.7	-2.0	-5.2	0.1	-2.6	3.3
AEO 1996											-4.0	-4.3	-2.8	-0.2	-0.6	-4.3	1.0	-1.2	5.7
AEO 1997												-2.0	0.1	4.5	5.5	2.3	8.5	7.1	15.7
AEO 1998													-3.9	3.5	6.4	3.2	9.9	7.8	15.7
AEO 1999														-4.0	-0.2	-3.4	4.2	2.7	10.4
AEO 2000															-4.2	-4.2	-0.2	-2.6	4.7
AEO 2001																-5.7	1.9	2.3	11.3
AEO 2002																	-0.1	3.8	13.0
AEO 2003																		0.8	9.6
AEO 2004																			0.9
Average Absolute Percent Error (All AEOs)	4.7	6.9	4.3	4.1	6.9	6.0	6.3	7.4	8.5	8.5	11.8	9.0	7.4	5.2	5.2	6.9	2.6	3.0	7.9

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 6.1.

Table 5. Total Coal Consumption, Actual vs. Forecasts

(million short tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	805	825	843	868	896	936													
AEO 1983	807	831	848	870	899	928					1061								
AEO 1984	843	848	866	889	919	958					1110								
AEO 1985	818	833	842	853	867	891	918	943	970	989	1008								
AEO 1986		813	831	860	870	888	919	945	972	995	1021	1038	1051	1069	1083	1105			
AEO 1987			837	837	854	879	896	912	932	954	975					1059			
AEO 1989*				872	882	894	903	927	947	965	987	990	1006	1026	1045	1062			
AEO 1990					884	893					984					1049			
AEO 1991						893	902	918	932	943	948	962	973	984	991	1003	1003	1011	1030.0
AEO 1992							905	934	919	925	934	944	953	961	971	993	1003	1011	1020.0
AEO 1993								929	931	940	947	958	965	970	972	987	997	1004	1010.0
AEO 1994									920	928	933	938	943	948	953	958	962	967	978.0
AEO 1995										935	940	941	947	948	951	954	958	963	971.0
AEO 1996											937	942	954	962	983	990	1004	1017	1027.0
AEO 1997												948	970	987	1003	1017	1020	1025	1034.0
AEO 1998													1009	1051	1044	1058	1087	1084	1090.0
AEO 1999														1040	1075	1092	1109	1113	1118.0
AEO 2000															1053	1086	1103	1124	1142.0
AEO 2001																1078	1112	1135	1153.3
AEO 2002																	1088	1092	1126.0
AEO 2003																		1040	1059.4
AEO 2004																			1100
Actual	818	804	837	884	895	904	899	908	944	951	962	1006	1030	1037	1039	1084	1060	1066	1094
Average Absolute Error (All AEOs)	12.3	25.8	9.5	21.0	18.4	21.9	9.0	22.1	17.9	20.4	41.9	51.0	56.7	50.9	46.1	55.5	56.0	54.5	56.9
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	-1.6	2.6	0.7	-1.8	0.1	3.5													
AEO 1983	-1.4	3.3	1.3	-1.5	0.4	2.6					10.3								
AEO 1984	3.1	5.4	3.5	0.6	2.7	5.9					15.4								
AEO 1985	0.0	3.6	0.6	-3.5	-3.1	-1.5	2.1	3.9	2.7	4.0	4.8								
AEO 1986		1.1	-0.7	-2.7	-2.8	-1.8	2.2	4.1	3.0	4.6	6.1	3.1	2.1	3.1	4.3	1.9			
AEO 1987			0.0	-5.3	-4.6	-2.8	-0.4	0.5	-1.3	0.3	1.3					-2.3			
AEO 1989*				-1.3	-1.5	-1.2	0.4	2.1	0.3	1.4	2.6	-1.6	-2.3	-1.1	0.6	-2.0			
AEO 1990					-1.2	-1.3					2.3					-3.2			
AEO 1991						-1.3	0.3	1.1	-1.3	-0.9	-1.5	-4.4	-5.5	-5.1	-4.6	-7.5	-5.4	-5.2	-5.9
AEO 1992							0.6	2.9	-2.7	-2.8	-2.9	-6.2	-7.4	-7.3	-6.5	-8.4	-5.4	-5.2	-6.8
AEO 1993								2.4	-1.4	-1.2	-1.6	-4.8	-6.3	-6.5	-6.4	-9.0	-6.0	-5.8	-7.7
AEO 1994									-2.6	-2.4	-3.0	-6.8	-8.4	-8.6	-8.2	-11.6	-9.3	-9.3	-10.6
AEO 1995										-1.7	-2.3	-6.5	-8.0	-8.6	-8.4	-12.0	-9.6	-9.7	-11.3
AEO 1996											-2.6	-6.4	-7.3	-7.2	-5.4	-8.7	-5.3	-4.6	-6.1
AEO 1997												-5.8	-5.8	-4.8	-3.4	-6.2	-3.8	-3.9	-5.5
AEO 1998													-2.0	1.3	0.5	-2.4	2.5	1.7	-0.4
AEO 1999														0.3	3.5	0.7	4.6	4.4	2.2
AEO 2000															1.4	0.2	4.0	5.4	4.4
AEO 2001																-0.6	4.9	6.4	5.4
AEO 2002																	2.6	2.4	2.9
AEO 2003																		-2.5	-3.2
AEO 2004																			0.5
Average Absolute Percent Error (All AEOs)	1.5	3.2	1.1	2.4	2.1	2.4	1.0	2.4	1.9	2.1	4.4	5.1	5.5	4.9	4.4	5.1	5.3	5.1	5.2

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions
 Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 7.1

Table 6. Total Electricity Sales, Actual vs. Forecasts

(billion kilowatthours)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	2364	2454	2534	2626	2708	2811													
AEO 1983	2318	2395	2476	2565	2650	2739					3153								
AEO 1984	2321	2376	2461	2551	2637	2738					3182								
AEO 1985	2317	2360	2427	2491	2570	2651	2730	2808	2879	2949	3026								
AEO 1986		2363	2416	2479	2533	2608	2706	2798	2883	2966	3048	3116	3185	3255	3324	3397			
AEO 1987			2460	2494	2555	2622	2683	2748	2823	2902	2977								3363
AEO 1989*				2556	2619	2689	2760	2835	2917	2994	3072	3156	3236	3313	3394	3473			
AEO 1990					2612	2689					3083								3488
AEO 1991						2700	2762	2806	2855	2904	2959	3022	3088	3151	3214	3282	3355	3427	3496
AEO 1992							2746	2845	2858	2913	2975	3030	3087	3146	3209	3276	3345	3415	3483
AEO 1993								2803	2840	2893	2946	2998	3052	3104	3157	3214	3271	3327	3383
AEO 1994									2843	2891	2928	2962	3004	3039	3071	3112	3148	3185	3228
AEO 1995										2951	2967	2983	3026	3058	3085	3108	3134	3166	3204
AEO 1996											2973	2998	3039	3074	3106	3137	3173	3215	3262
AEO 1997												3075	3115	3168	3229	3290	3328	3379	3437
AEO 1998													3106	3204	3255	3318	3388	3438	3488
AEO 1999														3205	3262	3333	3402	3454	3492
AEO 2000															3288	3360	3402	3461	3523
AEO 2001																3364	3440	3530	3608
AEO 2002																	3443	3502	3619
AEO 2003																		3414	3527
AEO 2004																			3495
Actual	2324	2369	2457	2578	2647	2713	2762	2763	2861	2935	3013	3101	3146	3264	3312	3421	3370	3463	3500
Average Absolute Error (All AEOs)	14.0	26.6	28.9	54.3	52.4	51.9	30.8	47.2	22.9	32.4	65.6	78.8	77.8	117.0	111.6	136.2	88.4	101.1	93.4
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	1.7	3.6	3.1	1.9	2.3	3.6													
AEO 1983	-0.3	1.1	0.8	-0.5	0.1	1.0					4.6								
AEO 1984	-0.1	0.3	0.2	-1.0	-0.4	0.9					5.6								
AEO 1985	-0.3	-0.4	-1.2	-3.4	-2.9	-2.3	-1.2	1.6	0.6	0.5	0.4								
AEO 1986		-0.2	-1.7	-3.8	-4.3	-3.9	-2.0	1.3	0.8	1.1	1.2	0.5	1.3	-0.3	0.4	-0.7			
AEO 1987			0.1	-3.3	-3.5	-3.3	-2.9	-0.6	-1.3	-1.1	-1.2					-1.7			
AEO 1989*				-0.9	-1.1	-0.9	-0.1	2.6	1.9	2.0	1.9	1.8	2.9	1.5	2.5	1.5			
AEO 1990					-1.3	-0.9					2.3					1.9			
AEO 1991						-0.5	0.0	1.5	-0.2	-1.0	-1.8	-2.6	-1.8	-3.5	-3.0	-4.1	-0.4	-1.0	-0.1
AEO 1992							-0.6	3.0	-0.1	-0.7	-1.3	-2.3	-1.9	-3.6	-3.1	-4.3	-0.7	-1.4	-0.5
AEO 1993								1.4	-0.8	-1.4	-2.2	-3.3	-3.0	-4.9	-4.7	-6.1	-2.9	-3.9	-3.3
AEO 1994									-0.6	-1.5	-2.8	-4.5	-4.5	-6.9	-7.3	-9.0	-6.6	-8.0	-7.8
AEO 1995										0.6	-1.5	-3.8	-3.8	-6.3	-6.9	-9.2	-7.0	-8.6	-8.5
AEO 1996											-1.3	-3.3	-3.4	-5.8	-6.2	-8.3	-5.8	-7.1	-6.8
AEO 1997												-0.8	-1.0	-2.9	-2.5	-3.8	-1.2	-2.4	-1.8
AEO 1998													-1.3	-1.8	-1.7	-3.0	0.5	-0.7	-0.3
AEO 1999														-1.8	-1.5	-2.6	1.0	-0.2	-0.2
AEO 2000															-0.7	-1.8	1.0	0.0	0.7
AEO 2001																-1.7	2.1	2.0	3.1
AEO 2002																	2.2	1.1	3.4
AEO 2003																		-1.4	0.8
AEO 2004																			-0.1
Average Absolute Percent Error (All AEOs)	0.6	1.1	1.2	2.1	2.0	1.9	1.1	1.7	0.8	1.1	2.2	2.5	2.5	3.6	3.4	4.0	2.6	2.9	2.7

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Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 8.1

Table 7. Domestic Crude Oil Production, Actual vs. Forecasts

(million barrels per day)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	8.79	8.85	8.84	8.80	8.66	8.21													
AEO 1983	8.67	8.71	8.66	8.72	8.80	8.63					8.11								
AEO 1984	8.86	8.70	8.59	8.45	8.28	8.25					7.19								
AEO 1985	8.92	8.96	9.01	8.78	8.38	8.05	7.64	7.27	6.89	6.68	6.53								
AEO 1986		8.80	8.63	8.30	7.90	7.43	6.95	6.60	6.36	6.20	5.99	5.80	5.66	5.54	5.45	5.43			
AEO 1987			8.31	8.18	8.00	7.63	7.34	7.09	6.86	6.64	6.54					6.03			
AEO 1989*				8.18	7.97	7.64	7.25	6.87	6.59	6.37	6.17	6.05	6.00	5.94	5.90	5.89			
AEO 1990					7.67	7.37					6.40					5.86			
AEO 1991						7.23	6.98	7.10	7.11	7.01	6.79	6.48	6.22	5.92	5.64	5.36	5.11	4.90	4.73
AEO 1992							7.37	7.17	6.99	6.89	6.68	6.45	6.28	6.16	6.06	5.91	5.79	5.71	5.66
AEO 1993								7.20	6.94	6.79	6.52	6.22	6.00	5.84	5.72	5.60	5.54	5.50	5.50
AEO 1994									6.87	6.50	6.18	5.92	5.72	5.54	5.35	5.18	5.07	5.00	4.93
AEO 1995										6.58	6.32	6.04	5.74	5.58	5.39	5.35	5.27	5.25	5.22
AEO 1996											6.54	6.33	6.16	5.95	5.79	5.65	5.51	5.42	5.35
AEO 1997												6.47	6.32	6.15	6.02	5.87	5.73	5.63	5.57
AEO 1998													6.41	6.39	6.28	6.17	6.08	6.01	5.94
AEO 1999														6.41	6.33	6.29	6.21	6.05	5.95
AEO 2000															6.01	5.98	5.81	5.65	5.52
AEO 2001																5.89	5.92	6.04	6.01
AEO 2002																	5.84	5.85	5.68
AEO 2003																		5.89	5.81
AEO 2004																			5.69
Actual	8.97	8.68	8.35	8.16	7.61	7.36	7.42	7.19	6.85	6.66	6.56	6.48	6.45	6.25	5.88	5.84	5.80	5.75	5.74
Average Absolute Error (All AEOs)	0.2	0.1	0.3	0.3	0.6	0.5	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	-2.0	2.0	5.9	7.8	13.8	11.6													
AEO 1983	-3.4	0.3	3.7	6.8	15.6	17.3					23.6								
AEO 1984	-1.2	0.2	2.9	3.5	8.8	12.2					9.6								
AEO 1985	-0.6	3.2	7.9	7.6	10.1	9.4	3.0	1.1	0.6	0.3	-0.5								
AEO 1986		1.4	3.4	1.7	3.8	1.0	-6.3	-8.2	-7.1	-6.9	-8.7	-10.5	-12.3	-11.4	-7.3	-7.0			
AEO 1987			-0.5	0.2	5.1	3.7	-1.0	-1.4	0.2	-0.3	-0.3					3.3			
AEO 1989*				0.2	4.7	3.9	-2.2	-4.5	-3.7	-4.4	-5.9	-6.7	-7.0	-5.0	0.3	0.9			
AEO 1990					0.7	0.2					-2.4					0.4			
AEO 1991						-1.7	-5.9	-1.3	3.8	5.2	3.5	0.0	-3.6	-5.3	-4.1	-8.2	-11.9	-14.7	-17.6
AEO 1992							-0.6	-0.3	2.1	3.4	1.8	-0.5	-2.7	-1.5	3.0	1.2	-0.2	-0.6	-1.3
AEO 1993								0.1	1.4	1.9	-0.6	-4.0	-7.0	-6.6	-2.7	-4.1	-4.5	-4.3	-4.1
AEO 1994									0.3	-2.4	-5.8	-8.7	-11.3	-11.4	-9.0	-11.3	-12.6	-13.0	-14.1
AEO 1995										-1.2	-3.7	-6.8	-11.0	-10.7	-8.4	-8.4	-9.2	-8.6	-9.0
AEO 1996											-0.3	-2.3	-4.5	-4.8	-1.6	-3.2	-5.0	-5.7	-6.7
AEO 1997												-0.2	-2.0	-1.6	2.4	0.6	-1.2	-2.0	-2.9
AEO 1998													-0.6	2.2	6.8	5.7	4.8	4.6	3.5
AEO 1999														2.5	7.6	7.8	7.0	5.3	3.7
AEO 2000															2.2	2.4	0.1	-1.7	-3.8
AEO 2001																1.0	2.1	5.1	4.7
AEO 2002																	0.7	1.8	-1.0
AEO 2003																		2.5	1.3
AEO 2004																			-0.8
Average Absolute Percent Error (All AEOs)	1.8	1.4	4.0	4.0	7.8	6.8	3.2	2.4	2.4	2.9	5.1	4.4	6.2	5.7	4.6	4.4	5.0	5.4	5.3

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 5.1.

Table 8. Natural Gas Production, Actual vs. Forecasts

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
(trillion cubic feet)																			
AEO 1982	14.74	14.26	14.33	14.89	15.39	15.88													
AEO 1983	16.48	16.27	16.20	16.31	16.27	16.29					14.89								
AEO 1984	17.48	17.10	17.44	17.58	17.52	17.32					16.39								
AEO 1985	16.95	17.08	17.11	17.29	17.40	17.33	17.32	17.27	17.05	16.80	16.50								
AEO 1986		16.30	16.27	17.15	16.68	16.90	16.97	16.87	16.93	16.86	16.62	16.40	16.33	16.57	16.23	16.12			
AEO 1987			16.21	16.09	16.38	16.32	16.30	16.30	16.44	16.62	16.81								
AEO 1989*				16.71	16.71	16.94	17.01	16.83	17.09	17.35	17.54	17.67	17.98	18.20	18.25	18.49			
AEO 1990					16.91	17.25					18.84					20.58			
AEO 1991						17.40	17.48	18.11	18.22	18.15	18.22	18.39	18.82	19.03	19.28	19.62	19.89	20.13	20.07
AEO 1992							17.43	17.69	17.95	18.00	18.29	18.27	18.51	18.75	18.97	19.19	19.48	19.78	19.91
AEO 1993								18.47	18.05	18.16	18.45	18.90	19.07	19.30	19.60	19.86	20.07	20.35	20.56
AEO 1994									17.71	17.68	17.84	18.12	18.25	18.43	18.58	18.93	19.28	19.51	19.80
AEO 1995										18.28	17.98	17.92	18.21	18.63	18.92	19.08	19.20	19.36	19.52
AEO 1996											18.90	19.15	19.52	19.59	19.59	19.65	19.73	19.97	20.36
AEO 1997												19.10	19.70	20.17	20.32	20.54	20.77	21.26	21.90
AEO 1998													18.85	19.06	20.35	20.27	20.60	20.94	21.44
AEO 1999														18.80	19.13	19.28	19.82	20.23	20.77
AEO 2000															18.36	18.89	18.47	18.50	18.88
AEO 2001																18.61	18.89	19.67	20.28
AEO 2002																	19.28	19.54	20.20
AEO 2003																		19.37	19.99
AEO 2004																			19.57
Actual	16.45	16.06	16.62	17.10	17.31	17.81	17.70	17.84	18.10	18.82	18.60	18.85	18.90	19.02	18.83	19.18	19.62	18.96	19.11
Average Absolute Error (All AEOs)	0.8	0.9	0.8	0.7	0.7	1.0	0.6	0.7	0.7	1.3	1.2	0.8	0.7	0.6	0.8	0.8	0.5	1.0	1.2
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	-10.4	-11.2	-13.8	-12.9	-11.1	-10.8													
AEO 1983	0.2	1.3	-2.5	-4.6	-6.0	-8.5					-19.9								
AEO 1984	6.2	6.5	4.9	2.8	1.2	-2.7					-11.9								
AEO 1985	3.0	6.4	2.9	1.1	0.5	-2.7	-2.1	-3.2	-5.8	-10.7	-11.3								
AEO 1986		1.5	-2.1	0.3	-3.6	-5.1	-4.1	-5.4	-6.4	-10.4	-10.6	-13.0	-13.6	-12.9	-13.8	-16.0			
AEO 1987			-2.5	-5.9	-5.4	-8.4	-7.9	-8.6	-9.1	-11.7	-9.6					-9.3			
AEO 1989*				-2.3	-3.5	-4.9	-3.9	-5.7	-5.6	-7.8	-5.7	-6.3	-4.9	-4.3	-3.1	-3.6			
AEO 1990					-2.3	-3.1					1.3					7.3			
AEO 1991						-2.3	-1.2	1.5	0.7	-3.6	-2.0	-2.5	-0.4	0.0	2.4	2.3	1.4	6.1	5.0
AEO 1992							-1.5	-0.8	-0.8	-4.4	-1.7	-3.1	-2.1	-1.4	0.7	0.0	-0.7	4.3	4.2
AEO 1993								3.5	-0.3	-3.5	-0.8	0.2	0.9	1.5	4.1	3.5	2.3	7.3	7.6
AEO 1994									-2.1	-6.1	-4.1	-3.9	-3.5	-3.1	-1.3	-1.3	-1.7	2.9	3.6
AEO 1995										-2.9	-3.3	-5.0	-3.7	-2.1	0.5	-0.5	-2.1	2.1	2.2
AEO 1996											1.6	1.6	3.3	3.0	4.0	2.4	0.6	5.3	6.6
AEO 1997												1.3	4.2	6.0	7.9	7.1	5.9	12.1	14.6
AEO 1998													-0.3	0.2	8.1	5.7	5.0	10.4	12.2
AEO 1999														-1.2	1.6	0.5	1.0	6.7	8.7
AEO 2000															-2.5	-1.5	-5.8	-2.4	-1.2
AEO 2001																-3.0	-3.7	3.7	6.1
AEO 2002																	-1.7	3.0	5.7
AEO 2003																		2.1	4.6
AEO 2004																			2.4
Average Absolute Percent Error (All AEOs)	5.0	5.4	4.8	4.3	4.2	5.4	3.5	4.1	3.8	6.8	6.5	4.1	3.7	3.2	4.2	4.3	2.7	5.3	6.1

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 6.1

Table 9. Coal Production, Actual vs. Forecasts

(million short tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	914	939	963	995	1031	1080													
AEO 1983	900	926	947	974	1010	1045					1191								
AEO 1984	899	921	948	974	1010	1057					1221								
AEO 1985	886	909	930	940	958	985	1015	1041	1072	1094	1116								
AEO 1986		890	920	954	962	983	1017	1044	1073	1097	1126	1142	1156	1176	1191	1217			
AEO 1987			917	914	932	962	978	996	1020	1043	1068					1149			
AEO 1989*				941	946	977	990	1018	1039	1058	1082	1084	1107	1130	1152	1171			
AEO 1990					973	987					1085					1178			
AEO 1991						1035	1002	1016	1031	1043	1054	1065	1079	1096	1111	1133	1142	1160	1193
AEO 1992							1004	1040	1019	1034	1052	1064	1074	1087	1102	1133	1144	1156	1173
AEO 1993								1039	1043	1054	1065	1076	1086	1094	1102	1125	1136	1148	1161
AEO 1994									999	1021	1041	1051	1056	1066	1073	1081	1087	1098	1107
AEO 1995										1006	1010	1011	1016	1017	1021	1027	1033	1040	1051
AEO 1996											1037	1044	1041	1045	1061	1070	1086	1100	1112
AEO 1997													1028	1052	1072	1088	1105	1110	1123
AEO 1998														1088	1122	1128	1145	1176	1183
AEO 1999															1125	1154	1168	1187	1198
AEO 2000																1120	1136	1153	1190
AEO 2001																	1111	1136	1198
AEO 2002																		1168	1162
AEO 2003																			1085
AEO 2004																			1099
																			1100
Actual	884	890	919	950	981	1029	996	998	945	1034	1033	1064	1090	1118	1100	1074	1128	1094	1069
Average Absolute Error (All AEOs)	16.1	26.8	19.3	21.7	30.2	39.1	13.0	30.6	91.6	25.4	58.9	25.9	31.1	39.0	34.6	63.0	34.6	51.4	79.6
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	3.4	5.5	4.8	4.7	5.1	4.9													
AEO 1983	1.9	4.0	3.1	2.5	3.0	1.5					15.3								
AEO 1984	1.7	3.4	3.2	2.5	3.0	2.7					18.2								
AEO 1985	0.3	2.1	1.2	-1.1	-2.3	-4.3	1.9	4.4	13.4	5.9	8.0								
AEO 1986		0.0	0.1	0.4	-1.9	-4.5	2.1	4.7	13.5	6.1	9.0	7.3	6.1	5.2	8.2	13.4			
AEO 1987			-0.2	-3.8	-5.0	-6.5	-1.8	-0.2	7.9	0.9	3.4					7.0			
AEO 1989*				-1.0	-3.5	-5.1	-0.6	2.1	9.9	2.4	4.7	1.9	1.6	1.1	4.7	9.1			
AEO 1990					-0.8	-4.1					5.0					9.7			
AEO 1991						0.6	0.6	1.9	9.1	0.9	2.0	0.1	-1.0	-1.9	1.0	5.5	1.3	6.0	11.5
AEO 1992							0.8	4.3	7.8	0.0	1.8	0.0	-1.5	-2.7	0.1	5.5	1.4	5.6	9.7
AEO 1993								4.2	10.3	2.0	3.1	1.1	-0.4	-2.1	0.1	4.8	0.7	4.9	8.6
AEO 1994									5.7	-1.2	0.8	-1.2	-3.1	-4.6	-2.5	0.7	-3.6	0.3	3.5
AEO 1995										-2.7	-2.2	-5.0	-6.8	-9.0	-7.2	-4.3	-8.4	-5.0	-1.7
AEO 1996											0.4	-1.9	-4.5	-6.5	-3.6	-0.3	-3.7	0.5	4.0
AEO 1997												-3.4	-3.5	-4.1	-1.1	2.9	-1.6	1.9	5.0
AEO 1998													-0.2	0.4	2.5	6.6	4.3	7.5	10.6
AEO 1999														0.7	4.9	8.8	5.3	9.0	12.0
AEO 2000															1.8	5.8	2.2	7.3	11.3
AEO 2001																3.4	0.7	7.9	12.1
AEO 2002																	3.6	4.3	8.7
AEO 2003																		-0.9	2.8
AEO 2004																			2.8
Average Absolute Percent Error (All AEOs)	1.8	3.0	2.1	2.3	3.1	3.8	1.3	3.1	9.7	2.5	5.7	2.4	2.8	3.5	3.1	5.9	3.1	4.7	7.4

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 7.1

Table 10. Petroleum Net Imports, Actual vs. Forecasts

(million barrels per day)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	7.58	7.45	7.12	6.82	6.66	7.09													
AEO 1983	5.15	5.44	5.73	5.79	5.72	5.95					6.96								
AEO 1984	4.85	5.11	5.53	5.95	6.31	6.59					8.65								
AEO 1985	4.17	4.38	4.73	4.93	5.36	5.72	6.23	6.66	7.14	7.39	7.74								
AEO 1986		5.15	5.38	5.46	5.92	6.46	7.09	7.50	7.78	7.96	8.20	8.47	8.74	9.04	9.57	9.76			
AEO 1987			5.81	6.04	6.81	7.28	7.82	8.34	8.71	8.94	8.98					10.01			
AEO 1989*				6.28	6.84	7.49	7.96	8.53	8.83	9.04	9.28	9.60	9.64	9.75	10.02	10.20			
AEO 1990					7.20	7.61					9.13					9.95			
AEO 1991						7.28	7.25	7.34	7.48	7.72	8.10	8.57	9.09	9.61	10.07	10.51	11.00	11.44	11.72
AEO 1992							6.86	7.42	7.88	8.16	8.55	8.80	9.06	9.32	9.50	9.80	10.17	10.35	10.56
AEO 1993								7.25	8.01	8.49	9.06	9.38	9.92	10.29	10.53	10.77	11.09	11.31	11.50
AEO 1994									8.04	8.77	9.21	9.60	10.02	10.24	10.63	10.94	11.23	11.54	11.79
AEO 1995										8.09	8.65	8.99	9.56	9.89	10.25	10.46	10.74	10.96	11.24
AEO 1996											8.25	8.82	9.31	9.64	10.08	10.43	10.66	10.90	
AEO 1997												8.49	8.89	9.58	10.04	10.48	10.89	11.19	11.48
AEO 1998													9.05	9.29	10.01	10.17	10.62	11.10	11.33
AEO 1999														9.26	9.43	10.65	11.02	11.38	11.61
AEO 2000															9.86	10.54	11.06	11.47	11.83
AEO 2001																10.17	10.95	11.04	11.27
AEO 2002																	9.02	9.55	9.40
AEO 2003																		9.00	9.57
AEO 2004																			9.52
Actual	4.29	5.44	5.91	6.60	7.20	7.16	6.63	6.96	7.62	8.05	7.89	8.52	9.16	9.76	9.91	10.45	10.90	10.55	11.24
Average Absolute Error (All AEOs)	1.2	0.7	0.6	0.8	0.8	0.6	0.7	0.7	0.5	0.5	0.8	0.4	0.4	0.4	0.3	0.3	0.4	0.7	0.6
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	76.8	37.0	20.4	3.3	-7.5	-1.0													
AEO 1983	20.2	0.0	-3.1	-12.3	-20.6	-16.9					-11.7								
AEO 1984	13.2	-6.0	-6.5	-9.9	-12.4	-8.0					9.7								
AEO 1985	-2.7	-19.5	-20.0	-25.4	-25.6	-20.1	-6.0	-4.3	-6.3	-8.2	-1.8								
AEO 1986		-5.3	-9.0	-17.3	-17.8	-9.8	7.0	7.8	2.1	-1.2	4.0	-0.6	-4.6	-7.4	-3.5	-6.6			
AEO 1987			-1.8	-8.5	-5.4	1.7	18.0	19.9	14.3	11.0	13.9					-4.2			
AEO 1989*				-4.9	-5.0	4.6	20.1	22.6	15.9	12.2	17.7	12.7	5.3	-0.1	1.1	-2.4			
AEO 1990					0.0	6.3					15.8					-4.8			
AEO 1991						1.7	9.4	5.5	-1.8	-4.1	2.7	0.6	-0.7	-1.6	1.6	0.6	0.9	8.5	4.3
AEO 1992							3.5	6.7	3.4	1.3	8.4	3.3	-1.1	-4.5	-4.2	-6.2	-6.7	-1.9	-6.0
AEO 1993								4.2	5.1	5.4	14.9	10.1	8.3	5.4	6.2	3.1	1.7	7.2	2.3
AEO 1994									5.5	8.9	16.8	12.7	9.4	4.9	7.2	4.7	3.0	9.4	4.9
AEO 1995										0.4	9.7	5.5	4.4	1.3	3.4	0.1	-1.5	3.9	0.0
AEO 1996											4.6	-0.1	-3.7	-4.6	-2.7	-3.5	-4.3	1.1	-3.0
AEO 1997												-0.4	-2.9	-1.9	1.3	0.3	-0.1	6.1	2.2
AEO 1998													-1.2	-4.9	1.0	-2.7	-2.6	5.2	0.8
AEO 1999														-5.2	-4.9	2.0	1.1	7.9	3.3
AEO 2000															-0.5	0.9	1.5	8.8	5.3
AEO 2001																-2.7	0.4	4.6	0.3
AEO 2002																	-17.3	-9.5	-16.3
AEO 2003																		-14.7	-14.8
AEO 2004																			-15.3
Average Absolute Percent Error (All AEOs)	28.2	13.6	10.1	11.7	11.8	7.8	10.7	10.1	6.8	5.9	10.1	5.1	4.2	3.8	3.1	3.0	3.4	6.8	5.6

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 5.1

Table 11. Natural Gas Net Imports, Actual vs. Forecasts

(trillion cubic feet)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	1.19	1.19	1.19	1.19	1.19	1.19													
AEO 1983	1.08	1.16	1.23	1.23	1.23	1.23					1.23								
AEO 1984	0.99	1.05	1.16	1.27	1.43	1.57					2.11								
AEO 1985	0.94	1.00	1.19	1.45	1.58	1.86	1.94	2.06	2.17	2.32	2.44								
AEO 1986		0.74	0.88	0.62	1.03	1.05	1.27	1.39	1.47	1.66	1.79	1.96	2.17	2.38	2.42	2.43			
AEO 1987			0.84	0.89	1.07	1.16	1.26	1.36	1.46	1.65	1.75					2.50			
AEO 1989*				1.15	1.32	1.44	1.52	1.61	1.70	1.79	1.87	1.98	2.06	2.15	2.23	2.31			
AEO 1990					1.26	1.43					2.07					2.68			
AEO 1991						1.36	1.53	1.70	1.82	2.11	2.30	2.33	2.36	2.42	2.49	2.56	2.70	2.75	2.83
AEO 1992							1.48	1.62	1.88	2.08	2.25	2.41	2.56	2.68	2.70	2.72	2.76	2.84	2.92
AEO 1993								1.79	2.08	2.35	2.49	2.61	2.74	2.89	2.95	3.00	3.05	3.10	3.17
AEO 1994									2.02	2.40	2.66	2.74	2.81	2.85	2.89	2.93	2.95	2.97	3.00
AEO 1995										2.46	2.54	2.80	2.87	2.87	2.89	2.90	2.90	2.92	2.95
AEO 1996											2.56	2.75	2.85	2.88	2.93	2.98	3.02	3.06	3.07
AEO 1997												2.82	2.96	3.16	3.43	3.46	3.50	3.53	3.58
AEO 1998													2.95	3.19	3.53	3.84	3.87	3.89	3.94
AEO 1999														2.92	3.16	3.29	3.41	3.44	3.47
AEO 2000															3.42	3.65	3.85	4.00	4.10
AEO 2001																3.51	3.76	3.88	4.07
AEO 2002																	3.68	3.74	4.04
AEO 2003																		3.17	3.32
AEO 2004																			3.51

Actual	0.89	0.69	0.94	1.22	1.27	1.45	1.64	1.92	2.21	2.46	2.69	2.78	2.84	2.99	3.42	3.54	3.60	3.50	3.24
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Average Absolute Error (All AEOs)	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.3	0.3	0.3	0.5	0.6	0.4	0.4	0.4
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(percent error)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	33.0	72.7	26.8	-2.5	-6.6	-17.7													
AEO 1983	20.7	68.3	31.1	0.8	-3.5	-15.0					-54.2								
AEO 1984	10.7	52.4	23.6	4.1	12.2	8.5					-21.5								
AEO 1985	5.1	45.1	26.8	18.8	24.0	28.6	18.0	7.2	-1.8	-5.8	-9.2								
AEO 1986		7.4	-6.2	-49.2	-19.2	-27.4	-22.8	-27.7	-33.5	-32.6	-33.4	-29.6	-23.5	-20.5	-29.3	-31.3			
AEO 1987			-10.5	-27.1	-16.1	-19.8	-23.4	-29.2	-33.9	-33.0	-34.9					-29.3			
AEO 1989*				-5.8	3.6	-0.5	-7.5	-16.2	-23.1	-27.3	-30.4	-28.9	-27.4	-28.2	-34.8	-34.7			
AEO 1990					-1.1	-1.2					-23.0					-24.2			
AEO 1991						-6.0	-6.9	-11.5	-17.6	-14.3	-14.4	-16.3	-16.8	-19.1	-27.2	-27.6	-25.1	-21.4	-12.5
AEO 1992							-10.0	-15.7	-14.9	-15.5	-16.3	-13.4	-9.8	-10.5	-21.1	-23.1	-23.4	-18.8	-9.8
AEO 1993								-6.8	-5.9	-4.6	-7.3	-6.3	-3.4	-3.4	-13.8	-15.2	-15.4	-11.4	-2.0
AEO 1994									-8.6	-2.5	-1.0	-1.6	-1.0	-4.8	-15.5	-17.2	-18.1	-15.1	-7.3
AEO 1995										-0.1	-5.5	0.6	1.2	-4.1	-15.5	-18.0	-19.5	-16.6	-8.8
AEO 1996											-4.7	-1.2	0.5	-3.8	-14.4	-15.8	-16.2	-12.6	-5.1
AEO 1997												1.3	4.3	5.6	0.2	-2.2	-2.9	0.9	10.6
AEO 1998													4.0	6.6	3.2	8.5	7.4	11.2	21.8
AEO 1999														-2.4	-7.7	-7.0	-5.4	-1.7	7.2
AEO 2000															-0.1	3.2	6.8	14.3	26.7
AEO 2001																-0.6	4.4	10.8	25.6
AEO 2002																	2.2	7.0	24.8
AEO 2003																		-9.3	2.5
AEO 2004																			8.5

Average Absolute Percent Error (All AEOs)	17.4	49.2	20.8	15.5	10.8	13.9	14.8	16.3	17.4	15.1	19.7	11.0	9.2	9.9	15.2	17.2	12.2	11.6	12.4
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* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 6.1

Table 12. World Oil Prices, Actual vs. Forecasts

(current dollars per barrel)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
AEO 1982	29.66	34.82	41.43	48.04	53.75	59.06														
AEO 1983	28.99	29.39	32.67	39.32	46.07	53.22					101.59									
AEO 1984	29.07	29.39	30.97	33.96	37.23	40.82					73.87									
AEO 1985	27.00	25.86	24.83	26.05	29.69	33.75	36.96	40.54	42.89	46.92	49.65									
AEO 1986		14.57	15.87	17.30	18.86	20.64	22.25	25.37	29.75	34.85	39.91	44.86	49.71	54.30	58.99	64.42				
AEO 1987			18.11	17.30	18.91	19.93	20.90	21.77	23.99	27.50	32.03									
AEO 1989*				14.70	14.93	16.33	17.75	19.15	21.68	25.21	28.91	33.29	37.81	42.47	46.36	49.98				
AEO 1990					17.70	17.49					26.58					46.17				
AEO 1991					22.00		24.77	25.59	26.45	27.34	28.37	29.44	30.54	32.03	34.28	36.89	39.84	43.34	47.08	
AEO 1992							19.03	20.06	20.65	22.27	24.20	26.31	28.66	31.17	33.96	36.96	39.90	42.96	46.05	
AEO 1993								18.86	20.25	21.24	22.45	23.68	25.02	26.71	28.64	31.02	33.48	36.27	38.90	
AEO 1994									17.06	17.21	18.24	19.43	20.64	22.12	23.76	25.52	27.51	29.67	31.86	
AEO 1995										15.24	17.27	18.23	19.26	20.39	21.59	22.97	24.33	25.79	27.27	
AEO 1996											17.16	17.74	18.59	19.72	20.97	22.34	23.81	25.26	26.72	
AEO 1997												19.99	19.42	19.55	20.07	20.59	21.68	22.71	23.75	
AEO 1998													18.54	18.79	19.87	20.95	21.79	22.53	23.46	
AEO 1999														12.50	13.64	14.67	16.35	17.87	19.64	
AEO 2000															17.35	21.80	20.99	21.52	22.05	
AEO 2001																28.21	24.86	22.82	22.36	
AEO 2002																	22.99	21.99	24.00	
AEO 2003																		23.65	26.92	
AEO 2004																			27.65	
Actual	26.99	14.00	18.13	14.56	18.08	21.76	18.70	18.20	16.14	15.51	17.14	20.64	18.53	12.04	17.26	27.70	22.00	23.71	27.71	
Average Absolute Error (All AEOs)	1.7	12.8	9.9	13.5	12.4	12.5	5.2	6.3	9.2	11.0	19.8	6.8	8.3	15.2	11.6	11.7	5.7	5.7	6.2	
(percent error)																				
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
AEO 1982	9.9	148.7	128.5	229.9	197.3	171.4														
AEO 1983	7.4	110.0	80.2	170.0	154.8	144.6					492.7									
AEO 1984	7.7	110.0	70.8	133.2	105.9	87.6					331.0									
AEO 1985	0.0	84.7	36.9	78.9	64.2	55.1	97.7	122.7	165.8	202.5	189.6									
AEO 1986		4.1	-12.5	18.8	4.3	-5.2	19.0	39.4	84.3	124.7	132.9	117.3	168.3	351.0	241.7	132.5				
AEO 1987			-0.1	18.8	4.6	-8.4	11.8	19.6	48.7	77.3	86.9					108.4				
AEO 1989*				1.0	-17.4	-24.9	-5.1	5.2	34.3	62.5	68.7	61.3	104.1	252.7	168.6	80.4				
AEO 1990					-2.1	-19.6					55.1					66.7				
AEO 1991						1.1	32.4	40.6	63.9	76.3	65.5	42.6	64.8	166.0	98.6	33.2	81.1	82.8	69.9	
AEO 1992							1.8	10.2	28.0	43.6	41.2	27.5	54.7	158.9	96.7	33.4	81.4	81.2	66.2	
AEO 1993								3.6	25.5	36.9	31.0	14.7	35.0	121.8	65.9	12.0	52.2	53.0	40.4	
AEO 1994									5.7	10.9	6.4	-5.9	11.4	83.7	37.7	-7.9	25.0	25.1	15.0	
AEO 1995										-1.8	0.8	-11.7	4.0	69.4	25.1	-17.1	10.6	8.8	-1.6	
AEO 1996											0.1	-14.0	0.3	63.8	21.5	-19.3	8.2	6.5	-3.6	
AEO 1997												-3.1	4.8	62.4	16.3	-25.7	-1.5	-4.2	-14.3	
AEO 1998													0.0	56.1	15.1	-24.4	-1.0	-5.0	-15.3	
AEO 1999														3.8	-21.0	-47.0	-25.7	-24.6	-29.1	
AEO 2000															0.5	-21.3	-4.6	-9.2	-20.4	
AEO 2001																1.8	13.0	-3.7	-19.3	
AEO 2002																	4.5	-7.3	-13.4	
AEO 2003																		-0.3	-2.9	
AEO 2004																			-0.2	
Average Absolute Percent Error (All AEOs)	6.3	91.5	54.8	93.0	68.8	57.5	28.0	34.5	57.0	70.7	115.5	33.1	44.7	126.3	67.4	42.1	25.7	24.0	22.3	

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 5.21

Table 13. Natural Gas Wellhead Prices, Actual vs. Forecasts

	(current dollars per thousand cubic feet)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
AEO 1982	4.32	5.47	6.67	7.51	8.04	8.57														
AEO 1983	2.93	3.11	3.46	3.93	4.56	5.26					12.74									
AEO 1984	2.77	2.90	3.21	3.63	4.13	4.79					9.33									
AEO 1985	2.60	2.61	2.66	2.71	2.94	3.35	3.85	4.46	5.10	5.83	6.67									
AEO 1986		1.73	1.96	2.29	2.54	2.81	3.15	3.73	4.34	5.06	5.90	6.79	7.70	8.62	9.68	10.80				
AEO 1987			1.83	1.95	2.11	2.28	2.49	2.72	3.08	3.51	4.07									
AEO 1989*				1.62	1.70	1.91	2.13	2.58	3.04	3.48	3.93	4.76	5.23	5.80	6.43	6.98				
AEO 1990					1.78	1.88					2.93					5.36				
AEO 1991						1.77	1.90	2.11	2.30	2.42	2.51	2.60	2.74	2.91	3.29	3.75	4.31	5.07	5.77	
AEO 1992							1.69	1.85	2.03	2.15	2.35	2.51	2.74	3.01	3.40	3.81	4.24	4.74	5.25	
AEO 1993								1.85	1.94	2.09	2.30	2.44	2.60	2.85	3.12	3.47	3.84	4.31	4.81	
AEO 1994									1.98	2.12	2.27	2.41	2.59	2.73	2.85	2.98	3.14	3.35	3.59	
AEO 1995										1.89	2.00	1.95	2.06	2.15	2.40	2.57	2.90	3.16	3.56	
AEO 1996											1.63	1.74	1.86	1.99	2.10	2.19	2.29	2.38	2.48	
AEO 1997												2.03	1.82	1.90	1.99	2.06	2.13	2.21	2.32	
AEO 1998													1.63	1.74	2.26	2.31	2.38	2.44	2.52	
AEO 1999														2.00	2.15	2.20	2.32	2.43	2.53	
AEO 2000															2.15	2.23	2.27	2.32	2.40	
AEO 2001																3.39	3.48	2.97	2.74	
AEO 2002																	4.03	2.06	2.53	
AEO 2003																		2.79	3.26	
AEO 2004																			4.97	
Actual	2.51	1.94	1.67	1.69	1.69	1.71	1.64	1.74	2.04	1.85	1.55	2.17	2.32	1.96	2.19	3.68	4.00	2.95	4.98	
Average Absolute Error (All AEOs)	0.6	1.3	1.6	1.7	1.8	1.9	0.9	1.0	1.0	1.3	3.0	1.0	1.2	1.3	1.4	1.7	1.0	0.8	1.7	
(percent error)																				
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
AEO 1982	72.0	182.1	299.6	344.6	375.6	401.0														
AEO 1983	16.7	60.1	107.4	132.5	169.8	207.4					721.7									
AEO 1984	10.4	49.3	92.3	114.6	144.6	180.1					501.7									
AEO 1985	3.6	34.4	59.0	60.2	74.2	95.9	135.0	156.3	150.1	215.4	330.3									
AEO 1986		-10.8	17.1	35.4	50.5	64.4	91.9	114.2	112.9	173.4	280.3	213.0	231.9	339.9	341.8	193.4				
AEO 1987			9.6	15.2	24.6	33.5	51.5	56.6	51.0	89.7	162.9					105.0				
AEO 1989*				-4.1	0.6	11.4	29.9	48.1	49.1	88.1	153.5	119.5	125.3	195.8	193.7	89.7				
AEO 1990					5.3	10.2					89.1					45.8				
AEO 1991						3.5	15.8	21.3	12.8	30.6	61.7	19.9	17.9	48.5	50.2	1.8	7.8	71.9	15.9	
AEO 1992							2.8	6.2	-0.4	16.1	51.6	15.7	18.2	53.7	55.1	3.5	5.9	60.5	5.5	
AEO 1993								6.1	-5.1	13.0	48.5	12.4	12.0	45.2	42.7	-5.8	-3.9	45.9	-3.4	
AEO 1994									-2.8	14.9	46.2	11.0	11.5	39.2	30.4	-19.0	-21.5	13.4	-27.9	
AEO 1995										2.3	28.9	-10.0	-11.0	9.8	9.6	-30.2	-27.6	7.1	-28.6	
AEO 1996											5.2	-19.8	-19.7	1.6	-3.9	-40.4	-42.8	-19.4	-50.3	
AEO 1997												-6.3	-21.4	-2.8	-9.2	-43.9	-46.6	-25.0	-53.5	
AEO 1998													-29.6	-11.0	3.0	-37.2	-40.5	-17.1	-49.5	
AEO 1999														2.1	-1.9	-40.1	-42.1	-17.8	-49.2	
AEO 2000															-2.0	-39.3	-43.3	-21.4	-51.9	
AEO 2001																-7.8	-12.9	0.8	-45.0	
AEO 2002																	0.6	-30.1	-49.1	
AEO 2003																		-5.6	-34.6	
AEO 2004																			-0.2	
Average Absolute Percent Error (All AEOs)	25.7	67.3	97.5	100.9	105.7	111.9	54.5	58.4	48.0	71.5	190.9	47.5	49.8	68.2	62.0	46.9	24.6	25.8	33.2	

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 6.7

Table 14. Coal Prices to Electric Generating Plants, Actual vs. Forecasts

	(current dollars per million Btu)																		
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	2.03	2.17	2.33	2.52	2.73	2.99													
AEO 1983	1.99	2.10	2.24	2.39	2.57	2.76					4.29								
AEO 1984	1.90	2.01	2.13	2.28	2.44	2.61					3.79								
AEO 1985	1.68	1.76	1.86	1.95	2.05	2.19	2.32	2.49	2.66	2.83	3.03								
AEO 1986		1.61	1.68	1.75	1.83	1.93	2.05	2.19	2.35	2.54	2.73	2.92	3.10	3.31	3.49	3.68			
AEO 1987			1.52	1.55	1.65	1.75	1.84	1.96	2.11	2.27	2.44					3.55			
AEO 1989*				1.50	1.51	1.68	1.77	1.88	2.00	2.13	2.26	2.40	2.55	2.70	2.86	3.00			
AEO 1990					1.46	1.53					2.07					2.76			
AEO 1991					1.51	1.58	1.66	1.77	1.88	1.96	2.06	2.16	2.28	2.41	2.57	2.70	2.85	3.04	
AEO 1992						1.54	1.61	1.66	1.75	1.85	1.97	2.03	2.14	2.26	2.44	2.55	2.69	2.83	
AEO 1993							1.92	1.54	1.61	1.70	1.77	1.87	1.96	2.07	2.22	2.35	2.46	2.60	
AEO 1994								1.50	1.54	1.64	1.73	1.78	1.82	1.92	2.01	2.13	2.22	2.30	
AEO 1995										1.42	1.46	1.49	1.55	1.59	1.62	1.67	1.76	1.80	1.89
AEO 1996											1.35	1.37	1.39	1.42	1.46	1.50	1.56	1.62	
AEO 1997												1.36	1.38	1.40	1.44	1.46	1.51	1.54	1.55
AEO 1998													1.28	1.28	1.30	1.32	1.34	1.36	1.37
AEO 1999														1.24	1.25	1.25	1.27	1.29	1.31
AEO 2000															1.28	1.27	1.24	1.24	1.24
AEO 2001																1.22	1.24	1.25	1.26
AEO 2002																	1.22	1.21	1.23
AEO 2003																		1.23	1.27
AEO 2004																			1.26
Actual	1.65	1.58	1.51	1.47	1.45	1.45	1.45	1.41	1.39	1.36	1.32	1.29	1.27	1.25	1.22	1.20	1.23	1.25	1.27
Average Absolute Error (All AEOs)	0.3	0.4	0.5	0.5	0.6	0.7	0.4	0.5	0.6	0.6	1.0	0.6	0.6	0.7	0.7	0.9	0.5	0.5	0.5
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	22.9	37.4	54.4	72.0	88.7	105.7													
AEO 1983	20.7	33.3	48.8	62.9	77.6	89.6					225.2								
AEO 1984	15.3	27.6	41.6	55.5	68.8	79.5					187.2								
AEO 1985	1.9	11.4	23.3	32.9	42.2	50.4	60.6	76.2	92.2	108.9	129.8								
AEO 1986		2.0	11.4	19.6	26.8	32.8	41.3	55.0	69.4	87.2	107.1	126.5	143.8	164.5	186.7	207.0			
AEO 1987			0.9	6.1	14.5	20.0	27.4	38.7	52.3	67.3	85.5					195.6			
AEO 1989*				2.3	4.8	15.3	22.6	33.1	44.6	57.5	71.5	85.9	100.4	115.3	135.0	149.9			
AEO 1990					1.0	5.2					57.2					129.8			
AEO 1991						3.8	9.1	17.8	28.1	38.7	48.8	59.9	69.9	81.8	98.1	114.1	118.9	127.8	139.4
AEO 1992							6.5	14.3	19.9	29.5	40.4	52.6	59.3	71.2	86.2	103.0	106.9	114.9	123.0
AEO 1993								35.9	11.3	18.8	29.3	37.6	47.2	56.2	70.2	85.1	90.4	97.0	104.6
AEO 1994									8.5	14.4	24.6	34.0	40.1	45.5	58.2	67.3	73.3	77.4	81.4
AEO 1995										4.9	11.0	15.5	21.4	26.7	33.2	39.1	42.8	44.3	48.9
AEO 1996											2.1	4.8	7.5	11.2	16.9	21.5	24.9	27.6	
AEO 1997												5.4	8.4	12.1	18.6	21.9	22.7	22.9	21.9
AEO 1998													0.2	2.6	7.2	9.6	8.5	8.5	8.2
AEO 1999														-0.7	2.6	4.6	3.4	3.2	2.9
AEO 2000															5.0	6.2	0.8	-0.9	-2.7
AEO 2001																2.0	0.5	0.4	-0.5
AEO 2002																	-0.7	-3.5	-2.9
AEO 2003																		-1.3	0.2
AEO 2004																			-0.9
Average Absolute Percent Error (All AEOs)	15.2	22.3	30.1	35.9	40.5	44.7	27.9	38.7	40.8	47.5	78.4	46.9	49.8	53.4	59.8	77.1	40.9	40.5	40.4

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Monthly Energy Review October 2004*, DOE/EIA-0035(2004/10) (Washington, DC, October 2004), Table 9.10

Table 15. Average Electricity Prices, Actual vs. Forecasts

(nominal cents per kilowatthour)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	6.38	6.96	7.63	8.23	8.83	9.49													
AEO 1983	6.85	7.28	7.74	8.22	8.68	9.18					13.12								
AEO 1984	6.67	7.05	7.48	7.89	8.25	8.65					11.53								
AEO 1985	6.62	6.94	7.32	7.63	7.89	8.15	8.46	8.85	9.20	9.61	10.04								
AEO 1986		6.67	6.88	7.05	7.18	7.35	7.52	7.65	7.87	8.31	8.83	9.41	10.01	10.61	11.33	12.02			
AEO 1987			6.63	6.65	6.92	7.12	7.38	7.62	7.94	8.36	8.86					11.99			
AEO 1989*				6.50	6.75	7.14	7.48	7.82	8.11	8.50	8.91	9.39	9.91	10.49	11.05	11.61			
AEO 1990					6.49	6.72					8.40					10.99			
AEO 1991						6.94	7.31	7.59	7.82	8.18	8.38	8.54	8.73	8.99	9.38	9.83	10.29	10.83	11.36
AEO 1992							6.97	7.16	7.32	7.56	7.78	8.04	8.29	8.57	8.93	9.38	9.82	10.26	10.73
AEO 1993								7.18	7.36	7.54	7.77	7.99	8.27	8.54	8.89	9.33	9.72	10.14	10.61
AEO 1994									6.95	7.12	7.41	7.59	7.79	8.01	8.36	8.62	9.02	9.32	9.76
AEO 1995										6.95	7.16	7.23	7.40	7.59	7.81	8.04	8.42	8.70	9.12
AEO 1996											7.23	7.30	7.42	7.60	7.84	8.07	8.33	8.60	8.90
AEO 1997												7.11	7.22	7.41	7.61	7.76	7.95	8.11	8.30
AEO 1998													6.94	6.89	7.03	7.08	7.16	7.27	7.42
AEO 1999														6.77	6.87	6.91	6.97	7.02	7.21
AEO 2000															6.68	6.76	6.75	6.73	6.79
AEO 2001																6.95	7.05	6.94	7.00
AEO 2002																	7.21	6.99	6.99
AEO 2003																		6.99	6.90
AEO 2004																			7.24
Actual	6.44	6.44	6.37	6.35	6.45	6.57	6.75	6.82	6.93	6.91	6.89	6.86	6.85	6.74	6.64	6.81	7.32	7.21	7.40
Average Absolute Error (All AEOs)	0.2	0.5	0.9	1.1	1.2	1.3	0.8	0.9	0.9	1.1	2.0	1.2	1.3	1.6	1.8	2.2	1.1	1.3	1.4
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	-0.9	8.0	19.7	29.6	37.0	44.4													
AEO 1983	6.4	13.0	21.5	29.4	34.6	39.7					90.4								
AEO 1984	3.5	9.5	17.4	24.3	27.8	31.6					67.4								
AEO 1985	2.8	7.7	14.8	20.1	22.3	24.1	25.3	29.7	32.8	39.0	45.8								
AEO 1986		3.5	8.0	11.1	11.3	11.9	11.4	12.2	13.6	20.2	28.2	37.2	46.2	57.5	70.6	76.5			
AEO 1987			4.1	4.8	7.3	8.4	9.3	11.7	14.5	21.0	28.6					76.1			
AEO 1989*				2.3	4.6	8.7	10.9	14.7	17.0	23.0	29.3	36.9	44.7	55.6	66.5	70.5			
AEO 1990					0.6	2.2					22.0					61.5			
AEO 1991						5.6	8.2	11.3	12.9	18.4	21.6	24.5	27.4	33.3	41.2	44.4	40.6	50.2	53.5
AEO 1992							3.3	4.9	5.7	9.4	13.0	17.2	21.0	27.2	34.5	37.7	34.1	42.3	45.0
AEO 1993								5.3	6.2	9.2	12.8	16.5	20.7	26.7	33.9	37.1	32.8	40.7	43.4
AEO 1994									0.3	3.1	7.5	10.7	13.7	18.8	25.9	26.6	23.3	29.2	31.9
AEO 1995										0.6	3.9	5.4	8.0	12.6	17.6	18.1	15.0	20.7	23.3
AEO 1996											5.0	6.4	8.4	12.8	18.1	18.4	13.7	19.3	20.2
AEO 1997												3.6	5.4	9.9	14.7	13.9	8.7	12.4	12.1
AEO 1998													1.3	2.3	5.9	4.0	-2.2	0.8	0.3
AEO 1999														0.5	3.4	1.4	-4.8	-2.7	-2.6
AEO 2000															0.7	-0.8	-7.7	-6.7	-8.2
AEO 2001																2.1	-3.7	-3.7	-5.4
AEO 2002																	-1.5	-3.0	-5.6
AEO 2003																		-3.0	-6.7
AEO 2004																			-2.2
Average Absolute Percent Error (All AEOs)	3.4	8.4	14.3	17.4	18.2	19.6	11.4	12.8	12.9	16.0	28.9	17.6	19.7	23.4	27.7	32.6	15.7	18.0	18.6

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 8.10

Table 16. Gross Domestic Product, Actual vs. Forecasts

(nominal billion dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO82	3,939	4,306	4,733	5,201	5,712	6,288													
AEO83	3,919	4,264	4,650	5,086	5,549	6,053					9,362								
AEO84	3,910	4,191	4,589	5,031	5,490	5,979					9,098								
AEO85	3,882	4,103	4,436	4,793	5,207	5,658	6,158	6,702	7,252	7,836	8,486								
AEO86		4,203	4,434	4,741	5,015	5,371	5,795	6,244	6,726	7,270	7,875	8,524	9,226	9,973	10,764	11,600			
AEO87			4,483	4,701	5,035	5,389	5,773	6,190	6,666	7,175	7,716					11,223			
AEO89*			4,857	5,182	5,575	6,013	6,483	6,987	7,525	8,106	8,756	9,400	10,103	10,863	11,632				
AEO90				5,236	5,550					7,882						11,329			
AEO91					5,457	5,695	6,078	6,399	6,738	7,145	7,607	8,099	8,629	9,197	9,828	10,527	11,255	12,005	
AEO92						5,648	5,992	6,346	6,710	7,115	7,530	7,968	8,456	8,991	9,573	10,209	10,872	11,572	
AEO93							5,941	6,339	6,714	7,117	7,542	7,995	8,509	9,027	9,591	10,224	10,881	11,573	
AEO94								6,264	6,622	6,944	7,298	7,679	8,070	8,508	8,989	9,483	10,011	10,588	
AEO95									6,761	7,090	7,418	7,837	8,244	8,676	9,134	9,613	10,152	10,744	
AEO96										7,057	7,355	7,754	8,151	8,576	9,039	9,543	10,059	10,606	
AEO97											7,585	7,883	8,268	8,708	9,181	9,646	10,120	10,661	
AEO98												8,060	8,439	8,828	9,248	9,690	10,147	10,622	
AEO99													8,478	8,771	9,178	9,592	10,035	10,494	
AEO2000														8,950	9,265	9,662	10,070	10,536	
AEO2001															9,975	10,578	11,159	11,752	
AEO2002																10,198	10,618	11,271	
AEO2003																	10,473	11,112	
AEO2004																		10,849	
Nominal GDP	4,220	4,463	4,740	5,104	5,484	5,803	5,996	6,338	6,657	7,072	7,398	7,817	8,304	8,747	9,268	9,817	10,128	10,487	11,004
Average Absolute Error (All AEOs)	308	250	185	216	256	303	209	250	285	370	666	448	518	551	629	789	397	398	442
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO82	-6.7	-3.5	-0.1	1.9	4.2	8.4													
AEO83	-7.1	-4.5	-1.9	-0.4	1.2	4.3					26.6								
AEO84	-7.3	-6.1	-3.2	-1.4	0.1	3.0					23.0								
AEO85	-8.0	-8.1	-6.4	-6.1	-5.1	-2.5	2.7	5.7	8.9	10.8	14.7								
AEO86		-5.8	-6.5	-7.1	-8.6	-7.4	-3.4	-1.5	1.0	2.8	6.4	9.0	11.1	14.0	16.1	18.2			
AEO87			-5.4	-7.9	-8.2	-7.1	-3.7	-2.3	0.1	1.5	4.3					14.3			
AEO89*				-4.8	-5.5	-3.9	0.3	2.3	5.0	6.4	9.6	12.0	13.2	15.5	17.2	18.5			
AEO90					-4.5	-4.4					6.6					15.4			
AEO91						-6.0	-5.0	-4.1	-3.9	-4.7	-3.4	-2.7	-2.5	-1.3	-0.8	0.1	3.9	7.3	9.1
AEO92							-5.8	-5.5	-4.7	-5.1	-3.8	-3.7	-4.0	-3.3	-3.0	-2.5	0.8	3.7	5.2
AEO93								-6.3	-4.8	-5.1	-3.8	-3.5	-3.7	-2.7	-2.6	-2.3	0.9	3.8	5.2
AEO94									-5.9	-6.4	-6.1	-6.6	-7.5	-7.7	-8.2	-8.4	-6.4	-4.5	-3.8
AEO95										-4.4	-4.2	-5.1	-5.6	-5.8	-6.4	-7.0	-5.1	-3.2	-2.4
AEO96											-4.6	-5.9	-6.6	-6.8	-7.5	-7.9	-5.8	-4.1	-3.6
AEO97												-3.0	-5.1	-5.5	-6.0	-6.5	-4.8	-3.5	-3.1
AEO98													-2.9	-3.5	-4.8	-5.8	-4.3	-3.2	-3.5
AEO99														-3.1	-5.4	-6.5	-5.3	-4.3	-4.6
AEO2000															-3.4	-5.6	-4.6	-4.0	-4.3
AEO2001																1.6	4.4	6.4	6.8
AEO2002																	0.7	1.3	2.4
AEO2003																		-0.1	1.0
AEO2004																			-1.4
Average Absolute Percent Error (All AEOs)	7.3	5.6	3.9	4.2	4.7	5.2	3.5	4.0	4.3	5.2	9.0	5.7	6.2	6.3	6.8	8.0	3.9	3.8	4.0

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Bureau of Economic Analysis, U.S. Department of Commerce, <http://www.bea.gov/dn1.htm>, October 2004

Table 17. Total Carbon Dioxide Emissions, Actual vs. Forecasts

(million metric tons carbon equivalent)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982																			
AEO 1983																			
AEO 1984																			
AEO 1985																			
AEO 1986																			
AEO 1987																			
AEO 1989*																			
AEO 1990																			
AEO 1991																			
AEO 1992																			
AEO 1993								1366	1378	1399	1420	1437	1455	1473	1486	1501	1517	1533	1547
AEO 1994									1380	1399	1414	1429	1442	1455	1467	1483	1495	1508	1527
AEO 1995										1401	1411	1415	1435	1448	1462	1471	1484	1497	1514
AEO 1996											1413	1425	1444	1460	1477	1490	1507	1524	1544
AEO 1997												1444	1467	1497	1524	1543	1559	1577	1599
AEO 1998													1493	1533	1557	1577	1607	1625	1644
AEO 1999														1506	1552	1585	1613	1630	1646
AEO 2000															1520	1552	1576	1600	1628
AEO 2001																1535	1577	1611	1643
AEO 2002																	1561	1584	1631
AEO 2003																		1536	1568
AEO 2004																			1566
Actual								1383	1413	1435	1451	1502	1520	1528	1551	1597	1568	1581	1579
Average Absolute Error (All AEOs)								17.4	33.7	35.6	35.9	72.5	63.7	47.6	47.0	70.1	38.5	41.4	43.8
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982																			
AEO 1983																			
AEO 1984																			
AEO 1985																			
AEO 1986																			
AEO 1987																			
AEO 1989*																			
AEO 1990																			
AEO 1991																			
AEO 1992																			
AEO 1993								-1.3	-2.5	-2.5	-2.1	-4.4	-4.3	-3.6	-4.2	-6.0	-3.2	-3.0	-2.0
AEO 1994									-2.3	-2.5	-2.5	-4.9	-5.1	-4.8	-5.4	-7.1	-4.6	-4.6	-3.3
AEO 1995										-2.4	-2.7	-5.8	-5.6	-5.2	-5.7	-7.9	-5.3	-5.3	-4.1
AEO 1996											-2.6	-5.2	-5.0	-4.4	-4.7	-6.7	-3.9	-3.6	-2.2
AEO 1997												-3.9	-3.4	-2.0	-1.8	-3.3	-0.6	-0.3	1.3
AEO 1998													-1.8	0.3	0.4	-1.2	2.5	2.8	4.1
AEO 1999														-1.4	0.1	-0.7	2.9	3.1	4.3
AEO 2000															-2.0	-2.8	0.5	1.2	3.2
AEO 2001																-3.8	0.6	1.9	4.1
AEO 2002																	-0.4	0.2	3.3
AEO 2003																		-2.8	-0.7
AEO 2004																			-0.8
Average Absolute Percent Error (All AEOs)								1.3	2.4	2.5	2.5	4.8	4.2	3.1	3.0	4.4	2.5	2.6	2.8

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions
Energy Information Administration, *Monthly Energy Review October 2004*, DOE/EIA-0035(2004/10) (Washington, DC, October 2004),
Historical Data: Table 12.1, and 2003 estimate from <http://www.eia.doe.gov/oiaf/1605/flash/flash.html>

Table 18. Energy Intensity, Actual vs. Forecasts

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	20.1	18.5	16.9	15.5	14.4	13.2													
AEO 1983	19.9	18.6	17.4	16.2	15.1	14.0					9.6								
AEO 1984	20.1	18.9	17.7	16.5	15.5	14.5					10.3								
AEO 1985	20.0	19.1	18.0	16.9	15.9	14.7	13.7	12.7	11.8	11.1	10.3								
AEO 1986		18.3	17.8	16.8	16.1	15.2	14.3	13.5	12.6	11.8	11.0	10.3	9.6	8.8	8.2	7.7			
AEO 1987			17.6	17.0	16.3	15.4	14.5	13.8	13.0	12.2	11.5								
AEO 1989*				16.9	16.2	15.2	14.2	13.3	12.5	11.7	11.0	10.4	9.7	9.0	8.4	8.0			
AEO 1990					16.1	15.4					11.7					8.6			
AEO 1991						15.5	14.9	14.2	13.6	13.0	12.5	11.9	11.3	10.8	10.3	9.7	9.2	8.7	8.3
AEO 1992							15.0	14.5	13.9	13.3	12.7	12.1	11.6	11.0	10.5	10.0	9.5	9.0	8.6
AEO 1993								14.7	13.9	13.4	12.8	12.3	11.8	11.2	10.7	10.2	9.6	9.2	8.7
AEO 1994									14.1	13.5	13.1	12.6	12.1	11.6	11.1	10.6	10.2	9.8	9.3
AEO 1995										13.2	12.7	12.2	11.7	11.3	10.8	10.4	9.9	9.5	9.0
AEO 1996											12.8	12.4	11.9	11.5	11.0	10.5	10.1	9.6	9.2
AEO 1997												12.2	11.9	11.5	11.1	10.7	10.2	9.9	9.5
AEO 1998													11.7	11.5	11.2	10.8	10.5	10.1	9.7
AEO 1999														11.2	11.1	10.8	10.5	10.2	9.8
AEO 2000															10.8	10.6	10.3	10.0	9.7
AEO 2001																9.8	9.4	9.2	8.9
AEO 2002																	9.6	9.5	9.2
AEO 2003																		9.3	9.0
AEO 2004																			9.0
Actual	18.1	17.2	16.7	16.2	15.5	14.6	14.1	13.6	13.2	12.6	12.3	12.1	11.4	10.9	10.4	10.1	9.5	9.3	8.9
Average Absolute Error (All AEOs)	1.9	1.5	0.8	0.5	0.6	0.6	0.5	0.6	0.7	0.8	1.1	0.6	0.6	0.7	0.7	0.8	0.5	0.4	0.4
(percent error)																			
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AEO 1982	10.8	7.4	1.0	-4.3	-7.3	-9.2													
AEO 1983	9.8	8.4	4.2	-0.2	-2.5	-4.2					-22.5								
AEO 1984	10.7	10.1	5.8	1.8	-0.1	-1.0					-16.7								
AEO 1985	10.3	11.2	7.6	4.4	2.4	0.9	-3.1	-6.3	-10.0	-12.3	-16.2								
AEO 1986		6.5	6.3	3.7	3.8	4.0	1.4	-0.8	-4.2	-6.6	-10.9	-14.4	-16.0	-19.1	-21.1	-23.3			
AEO 1987			5.3	4.8	5.0	5.3	3.0	1.6	-1.5	-3.4	-7.1					-18.7			
AEO 1989*				4.3	4.3	3.9	0.7	-1.7	-5.0	-7.1	-10.8	-14.0	-14.8	-17.3	-19.2	-20.7			
AEO 1990					3.8	5.5					-5.5					-14.7			
AEO 1991						6.0	5.7	4.4	3.3	3.4	1.1	-1.4	-0.6	-0.8	-1.8	-3.4	-3.1	-6.5	-7.2
AEO 1992							6.3	7.1	5.4	5.3	3.1	0.7	1.7	1.6	0.6	-0.9	-0.3	-3.5	-4.1
AEO 1993								8.0	5.9	6.0	4.1	2.0	3.1	2.9	2.2	0.9	1.4	-2.0	-2.5
AEO 1994									6.8	7.1	5.9	4.3	5.8	6.6	6.4	5.7	7.1	4.4	4.7
AEO 1995										4.6	2.9	1.3	2.8	3.7	3.6	2.8	4.2	1.4	1.4
AEO 1996											4.1	2.9	4.6	5.4	5.3	4.4	5.7	3.1	3.6
AEO 1997												1.3	4.1	5.8	6.2	5.8	7.6	5.6	6.4
AEO 1998														3.0	5.4	7.1	9.9	8.0	9.1
AEO 1999															2.6	5.9	7.3	8.7	9.9
AEO 2000																3.2	5.1	7.1	9.0
AEO 2001																	-2.9	-0.8	-0.7
AEO 2002																		1.3	1.8
AEO 2003																			-0.4
AEO 2004																			1.4
Average Absolute Percent Error (All AEOs)	10.4	8.7	5.0	3.3	3.6	4.4	3.4	4.3	5.3	6.2	8.5	4.7	5.6	6.5	6.9	8.2	5.0	4.2	4.6

* There is no report titled *Annual Energy Outlook 1988* due to a change in the naming convention of the AEOs.

Sources: Forecasts: *Annual Energy Outlook*, Mid-Price or Reference Case Projections, Various Editions

Historical Data: Energy Information Administration, *Annual Energy Review 2003*, DOE/EIA-0384(2003) (Washington, DC, September 2004), Table 1.3, and Bureau of Economic Analysis, U.S. Dept. of Commerce, <http://www.bea.gov/bea/dn1.htm>, October 2004.