

# **Analysis of Restricted Natural Gas Supply Cases**

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## Preface

On February 3, 2004, Representative Barbara Cubin, Chairman of the Subcommittee on Energy and Mineral Resources of the U.S. House Committee on Resources, requested that the Energy Information Administration (EIA) provide an assessment of three low natural gas supply scenarios. She requested that the *Annual Energy Outlook 2004* be rerun with three different assumptions, separately and combined. The three differing assumptions are as follows:

- No increased availability of Alaska natural gas,
- No significant increase in production of tight sands natural gas (or other nonconventional sources), and
- Inability to permit more than three additional average-sized liquefied natural gas off-loading facilities.

This report responds to that request. These four scenarios were analyzed using the National Energy Modeling System. These alternative cases were compared to the *Annual Energy Outlook 2004* reference case, which serves as the analytical baseline.

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The projections in the reference case used in this report are not statements of what will happen but of what might happen, given the assumptions and methodologies used. The reference case projections are business-as-usual trend forecasts, given known technology, technological and demographic trends, and current laws and regulations. Thus, they provide a policy-neutral starting point that can be used to analyze policy initiatives. EIA does not propose, advocate, or speculate on future legislative and regulatory changes. All laws are assumed to remain as currently enacted; however, the impacts of scheduled regulatory changes, when defined, are reflected.

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# Introduction

This analysis of four scenarios that restrict future natural gas supply responds to a request by Representative Barbara Cubin, Chairman of the Subcommittee on Energy and Mineral Resources of the U.S. House Committee on Resources, on February 3, 2004. A copy of the request letter is included in Appendix A.

The four restricted natural gas supply cases are compared to the *Annual Energy Outlook 2004 (AEO2004)*<sup>1</sup> reference case to determine the impact of these supply restrictions on natural gas production, consumption, imports, and prices. The four restricted supply cases are defined as follows:

- 1) the no Alaska gas pipeline case,
- 2) the limited new liquefied natural gas (LNG) terminal capacity case,
- 3) the lower ultimate unconventional gas recovery (UGR) per well case, and
- 4) the combined case, which incorporates the assumptions of the three other cases.

The no Alaska pipeline case assumes that the Alaska natural gas pipeline, which would transport North Slope Alaska gas to the lower 48 States, will not be built. The National Energy Modeling System (NEMS)<sup>2</sup> evaluates the economic attractiveness of constructing a natural gas pipeline from the Alaska North Slope to the lower 48 States. In the *AEO2004* reference case, natural gas prices are projected to be sufficiently high after 2009 to begin construction of the pipeline, with gas deliveries beginning in 2018. In the no Alaska pipeline case, however, NEMS is precluded from constructing this pipeline.

The low LNG case constrains proposed U.S. LNG import capacity to approximately 2.1 trillion cubic feet (tcf) of annual capacity. This case assumes that the following LNG terminals are built: two new LNG import facilities of 1 billion cubic feet per day each on the Gulf Coast and one 500-million-cubic-foot-per-day facility in the Bahamas into Florida. This case does not limit the construction of LNG facilities in Baja California, Mexico, whose gas can be piped into the western United States.

In the low UGR case, future unconventional gas<sup>3</sup> production remains at approximately current levels under reference case prices by assuming that:

- there is no future technological improvement in the development and production of unconventional gas resources;
- less unconventional gas is produced over the life of each well; and
- unconventional gas production has a higher reserve-to-production requirement than in the reference case.

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<sup>1</sup> Energy Information Administration, *Annual Energy Outlook 2004*, DOE/EIA-0383(2004) (Washington, DC, January 2004), [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2004\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2004).pdf).

<sup>2</sup> Energy Information Administration, *The National Energy Modeling System: An Overview 2003*, DOE/EIA-0581(2003) (Washington, DC, March 2003), <http://www.eia.doe.gov/oiaf/aeo/overview/index.html>.

<sup>3</sup> Unconventional gas refers to tight (low permeability) sandstone gas, shale gas, and coalbed methane.

These assumptions take effect immediately after the 2002 base year.

Unlike the other two cases, the low UGR case allows future unconventional gas production to increase in higher price scenarios. At higher wellhead prices, new unconventional gas wells can be completed, as long as they are subject to the three assumptions noted above. Consequently, in the combined case, when wellhead gas prices are significantly higher than those projected in the low UGR case, unconventional gas production is higher than in the low UGR case and higher than current production levels.

The combined case is a severely restricted gas supply scenario that goes beyond what might be plausibly expected in the future. Model projections for this case are especially uncertain. In addition to the possibility of significant shutdowns in gas-intensive industries, the high sustained gas prices that are projected might lead to considerably more energy conservation, to more extensive fuel switching, or to the construction of additional LNG facilities in Canada or Mexico.

## Analysis Summary

Table 1 displays the gas consumption, production, net imports, and wellhead price levels projected for each of the restricted supply cases and compares those projections to both 2002 levels and the levels in the *AEO2004* reference case.

In 2025, consumption ranges from 700 billion cubic feet (bcf) lower than the reference case in the no Alaska case to 4.5 tcf lower in the combined case. Electric generator consumption of natural gas is most affected, with 3 tcf less consumption in 2025 in the combined case.

The lower-48 average wellhead price impact in 2025 ranges from 20 cents per thousand cubic feet (mcf) higher in 2002 dollars in the no Alaska case to \$1.21 per mcf higher in the combined case. The effect on delivered natural gas prices to electric generators ranges from 19 cents per mcf higher in 2025 in the no Alaska case to \$1.10 per mcf higher in the combined case. It is important to note that these price differences are average annual differences and that seasonal variation or other events causing volatility could result in higher prices.

Because the supply restrictions applied in the four scenarios result in higher prices for natural gas, gas supply tends to increase from those sources that are not restricted in each case. In the no Alaska case, imports and lower-48 production increase. In the low LNG case, Canadian and Mexican imports and lower 48 production increase and an Alaska gas pipeline begins operating in 2017, 1 year earlier than in the reference case. In the low UGR case, imports and conventional lower-48 gas production increase and an Alaska gas pipeline begins operating in 2013. In the combined case, expansion is limited to conventional lower 48 production and Canadian and Mexican imports (Mexican imports are mainly LNG facilities in Baja California, whose gas is piped to the western United States) because all other sources of gas supply are restricted.

The mix of fuels used for electric generation changes because of the impact of supply restrictions on natural gas prices, with increases in generation from coal and renewable energy. The share of electricity generated with natural gas in 2025 is reduced by between 1 percentage point (no Alaska case) and 8 percentage points (combined case). The coal generation share in 2025 increases by between 1 and 5 percentage points. In the combined case, oil-fired generation increases significantly because dual-fired units that can burn both oil and gas switch to oil when natural gas prices get sufficiently high.

The projected change in industrial gas use under the restricted supply scenarios is smaller than the projected change in gas use for electricity generation. This, in part, reflects an assumption that a widespread shutdown of U.S. capacity in gas-intensive sectors, such as fertilizer and bulk chemicals, is unlikely. In the combined case, energy expenditures are 6 percent higher in 2025, but still represent just 3.2 percent of annual manufacturing expenditures in that year. If, however, industrial demand for natural gas were more price sensitive than represented in this analysis, the impacts of these restricted gas supply cases on electric generation and wellhead gas prices would both tend to be reduced.

**Table 1. U.S. Natural Gas Consumption, Production, Net Imports and Wellhead Prices Across Cases, 2015 and 2025**

	2002	AEO2004 Reference	No Alaska Pipeline	Low LNG	Low UGR	Combined
		2015				
Total Consumption (trillion cubic feet)	22.7	28.0	28.0	27.6	27.6	26.0
--Residential	4.9	5.7	5.7	5.6	5.6	5.5
--Commercial	3.2	3.6	3.6	3.6	3.6	3.5
--Industrial	7.2	8.9	8.9	8.8	8.8	8.6
--Electric Power	5.7	7.6	7.7	7.3	7.4	6.2
--Other	1.7	2.2	2.2	2.2	2.2	2.2
Total Production (trillion cubic feet)	19.0	21.6	21.6	22.2	20.7	20.3
--Lower 48 Conventional	12.7	12.3	12.3	12.6	12.9	13.5
--Unconventional	5.9	8.7	8.7	9.0	5.5	6.2
--Alaska	0.4	0.6	0.6	0.6	2.3	0.6
Net Imports (trillion cubic feet)	3.5	6.2	6.2	5.2	6.7	5.5
--Canada	3.6	3.2	3.2	3.3	3.1	3.4
--Mexico	-0.3	-0.2	-0.2	-0.1	-0.1	-0.0
--Liquefied Natural Gas	0.2	3.2	3.2	2.1	3.7	2.1
Average Wellhead Prices (2002 dollars per thousand cubic feet)	2.95	4.19	4.20	4.49	4.28	5.02
	<b>2002</b>	<b>2025</b>				
Total Consumption (trillion cubic feet)	22.7	31.4	30.7	30.0	29.7	26.9
--Residential	4.9	6.1	6.1	6.0	6.0	5.9
--Commercial	3.2	4.0	4.0	4.0	4.0	3.8
--Industrial	7.2	10.3	10.2	10.1	10.1	9.6
--Electric Power	5.7	8.4	8.1	7.3	7.3	5.4
--Other <sup>a</sup>	1.7	2.3	2.3	2.7	2.3	2.2
Total Production (trillion cubic feet)	19.0	24.0	22.7	24.9	20.8	20.2
--Lower 48 Conventional	12.7	12.1	12.3	12.5	12.4	13.2
--Unconventional	5.9	9.2	9.6	9.6	5.7	6.3
--Alaska	0.4	2.7	0.7	2.7	2.7	0.7
Net Imports (trillion cubic feet)	3.5	7.2	7.9	4.9	8.7	6.5
--Canada	3.6	2.6	2.8	2.8	2.9	3.5
--Mexico	-0.3	-0.1	0.0	0.0	0.4	0.9
--Liquefied Natural Gas	0.2	4.8	5.1	2.1	5.4	2.1
Average Wellhead Prices (2002 dollars per thousand cubic feet)	2.95	4.40	4.60	4.74	4.85	5.61

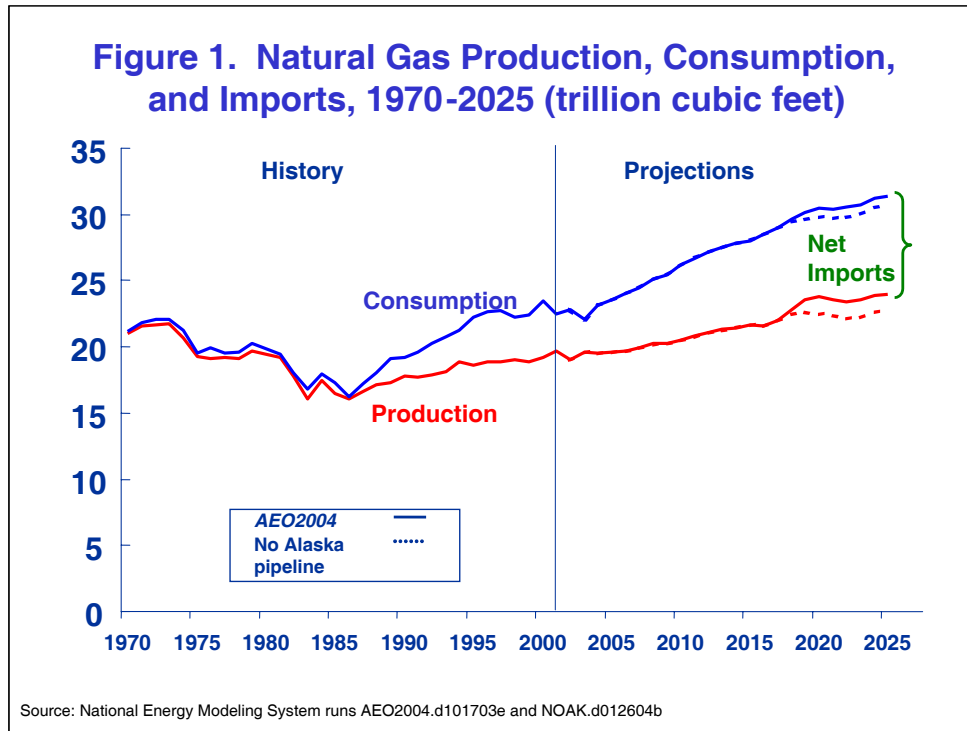
<sup>a</sup> Other includes transportation, pipeline fuel, and lease and plant fuel.

Note: Totals may not add due to rounding.

Source: National Energy Modeling System runs aeo2004.d101703e, noak.d012604b, lowlng.d020404a, ug0tec03.d020404b, and lowgas01.d020404a.



## No Alaska Pipeline Case and AEO2004 Reference Case

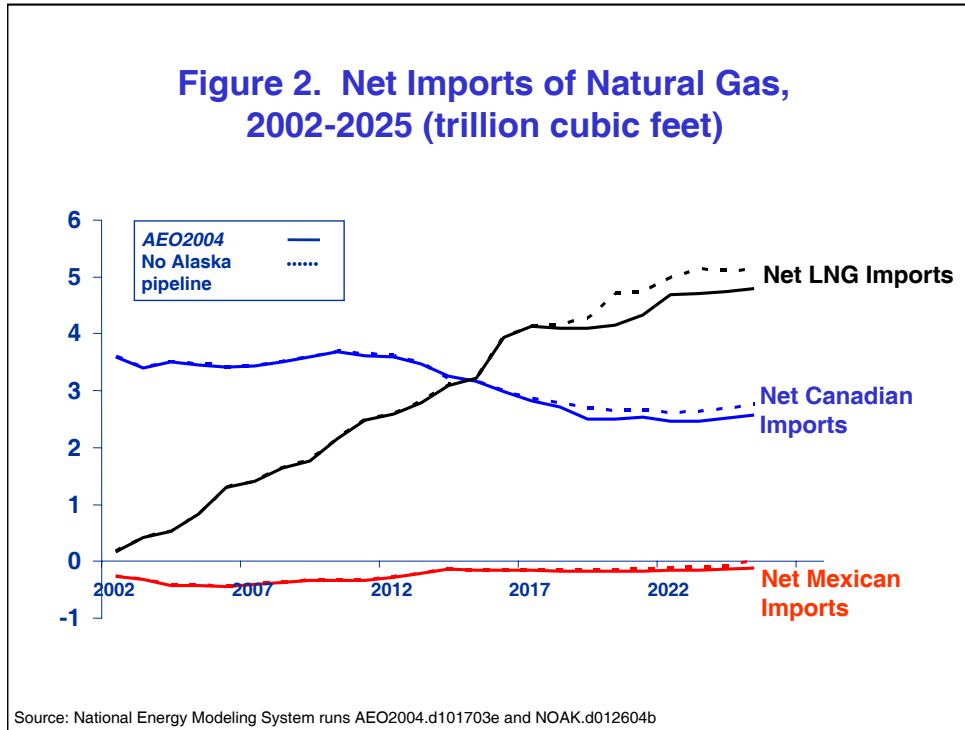


The no Alaska pipeline case is projected to change the natural gas supply and demand balance only after 2017, because the *AEO2004* reference case projects the pipeline to become operational in 2018. In 2025, the absence of the Alaska gas pipeline reduces Alaska gas supplies to the lower 48 by 2 tcf.

The lack of Alaska gas supplies to the lower 48 raises gas prices, which reduces consumption and stimulates higher lower 48 gas production and higher net gas imports (Figure 1). In 2025, gas consumption is 2 percent lower, 0.7 tcf, while lower 48 gas production is nearly 3 percent higher (0.7 tcf). Because the reduction in consumption and the increase in lower 48 production do not meet the shortfall in Alaska gas, net gas imports also rise by 9 percent (0.6 tcf).

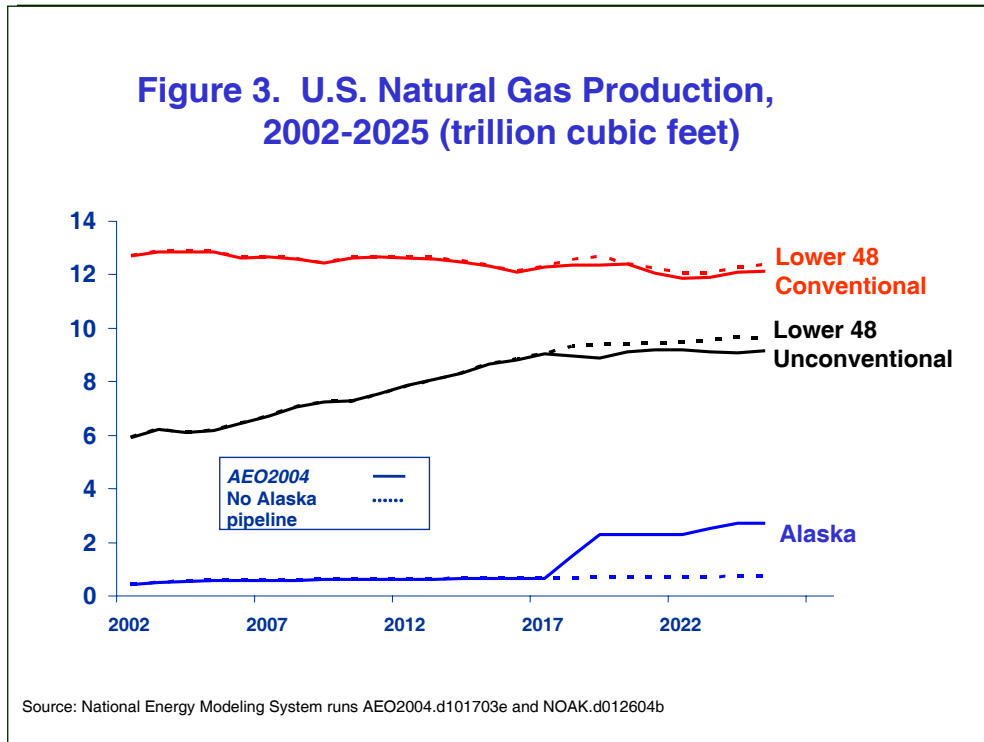
The largest reductions in end-use consumption occur in the electric generation and industrial sectors, with gas consumption reduced in these sectors by 4 percent (0.3 tcf) and 1 percent (0.1 tcf), respectively, in 2025.

## No Alaska Pipeline Case and AEO2004 Reference Case



An increase in net gas imports is projected to occur for all major sources of gas imports, when an Alaska gas pipeline is not allowed. In 2025, net LNG imports are projected to show the greatest increase (0.3 tcf greater than in the reference case). In 2025, net Canadian gas imports are projected to be 0.2 tcf higher, while net gas exports to Mexico are projected to be 0.1 tcf less (Figure 2).

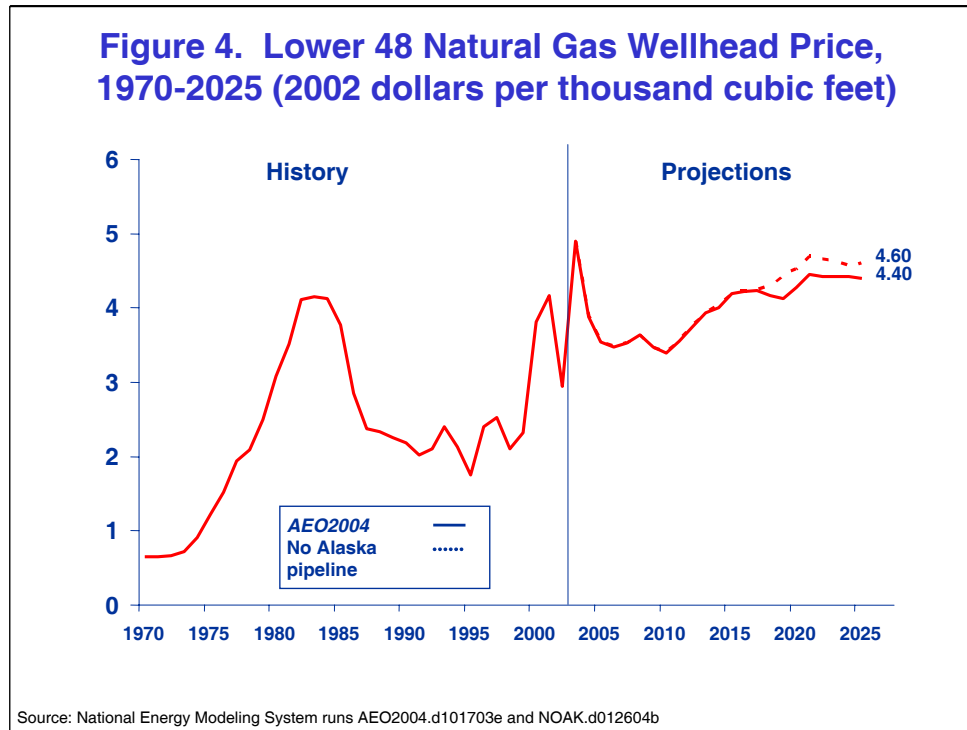
## No Alaska Pipeline Case and AEO2004 Reference Case



In 2025, lower 48 gas production in the no Alaska pipeline case is projected to be 21.9 tcf, compared with 21.3 in the reference case, raising both conventional and unconventional gas production in the lower 48 States (Figure 3).

In 2025, conventional lower 48 gas production is projected to be 12.3 tcf in the no Alaska pipeline case, compared to 12.1 tcf in the reference case. In 2025, unconventional lower 48 gas production is projected to be 9.6 tcf in the no Alaska pipeline case, compared with 9.2 tcf in the reference case.

## No Alaska Pipeline Case and AEO2004 Reference Case

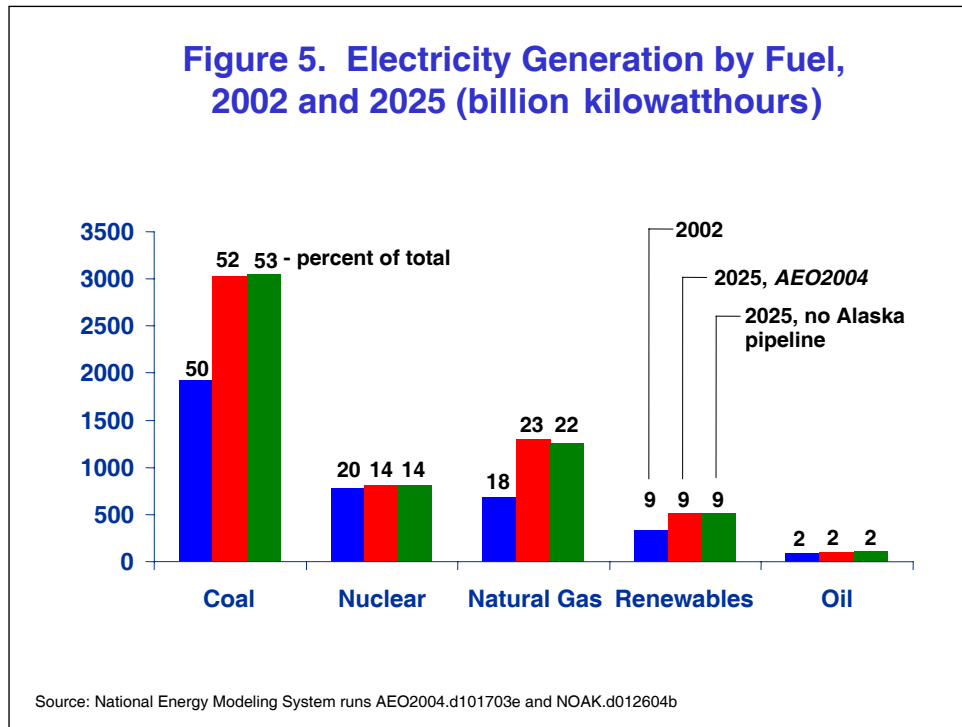


The reference case projects that the operation of the Alaska gas pipeline would cause wellhead gas prices to drop from \$4.23 per mcf in 2002 dollars in 2017 to \$4.13 per mcf by 2019, then rise to \$4.40 per mcf in 2025 (Figure 4).

The no Alaska pipeline case eliminates this initial drop in prices and projects wellhead gas prices to continue to increase immediately after 2017. Prices peak in 2021 in the no Alaska pipeline case and remain about level as electricity generation from coal and renewables increases. In 2025, the no Alaska pipeline case projects a wellhead gas price of \$4.60 per mcf, which is 20 cents per mcf greater than the price projected in the reference case.

The higher wellhead gas price in the no Alaska pipeline case is projected to result in lower gas consumption and higher lower 48 gas production and net gas imports, relative to those projected in the reference case.

## No Alaska Pipeline Case and AEO2004 Reference Case

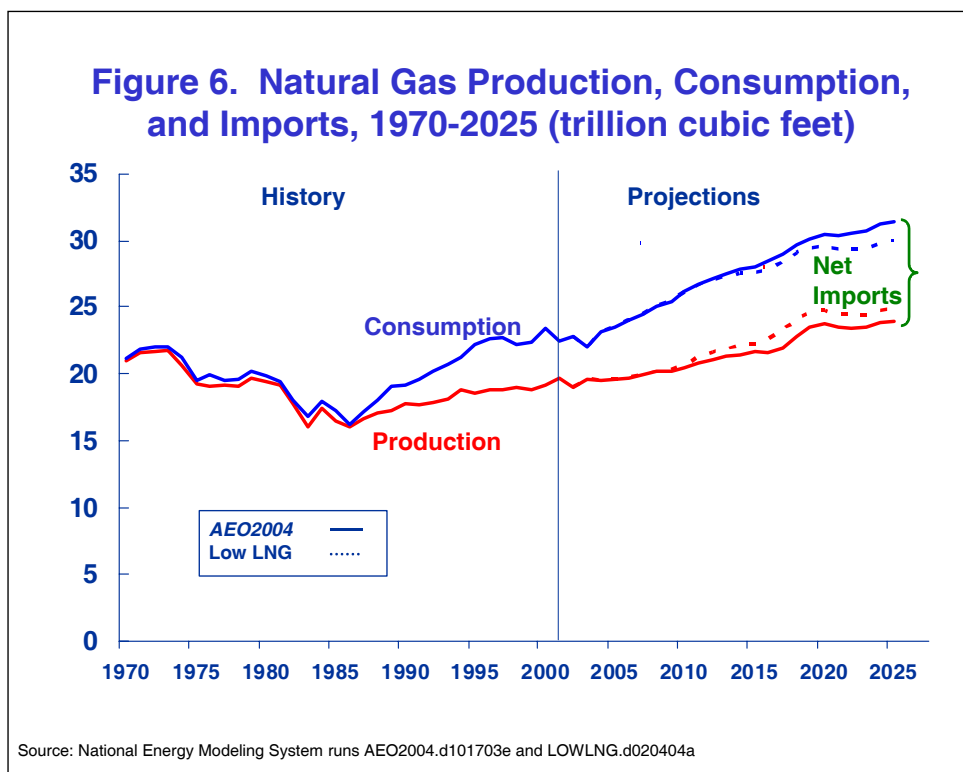


The higher gas prices projected in the no Alaska pipeline case reduce both the construction of new gas-fired electricity generation and the utilization of existing gas-fired electricity capacity. In 2025, gas-fired electricity generation is projected to be 1,257 billion kilowatthours in the no Alaska pipeline case, compared with 1,304 billion kilowatthours in the reference case (Figure 5).

The primary beneficiary of lower gas-fired power generation is coal, which is projected to increase its power generation in 2025 to 3,053 billion kilowatthours in the no Alaska pipeline case, compared to 3,029 billion kilowatthours in the reference case. Renewable energy power generation also increases slightly in 2025, from 509 billion kilowatthours in the reference case to 513 billion kilowatthours in the no Alaska pipeline case.

Busbar electricity prices are relatively unchanged in the no Alaska pipeline case. In 2025, the electricity price is 6.94 cents per kilowatthour (2002 dollars), compared to 6.91 cents per kilowatthour in the reference case. This small change in the electricity price is due both to the modest change in 2025 wellhead prices (20 cents per mcf) and the fact that gas-fired electricity generation is less than 25 percent of total U.S. generation. The change in gas prices is minimized by the large availability of non-gas-fired electricity generation, whose price did not change.

## Low Liquefied Natural Gas Case and *AEO2004* Reference Case



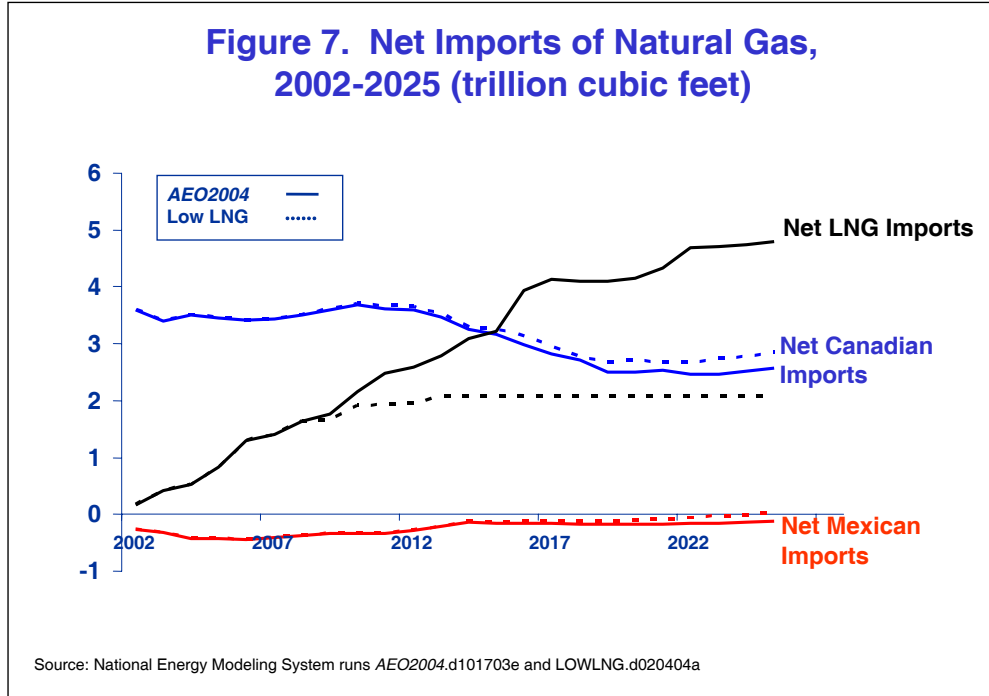
In the low LNG case, net LNG imports are permitted to reach a level of 2.1 tcf in 2013, and then remain constant thereafter. In the reference case, net LNG imports reach 2.1 tcf by 2010, but LNG imports are permitted to grow throughout the remainder of the forecast, increasing to 4.8 tcf by 2025.

The low LNG case is a more severe gas supply constraint case than the no Alaska pipeline case, and the impact of the low LNG case begins earlier in the projection, after 2010 in the low LNG case, compared to after 2018 in the no Alaska pipeline case. Consequently, the impacts of this case are more pronounced with respect to changes in gas consumption, production, and prices.

In general, gas consumption in 2025 is 5 percent lower (1.4 tcf) in the low LNG case than in the reference case, while U.S. gas production is 4 percent higher (0.9 tcf) (Figure 6). Because of the constraints placed on new LNG facilities, net gas imports in 2025 are 32 percent lower, 4.9 tcf in the low LNG case compared to 7.2 tcf in the reference case.

The largest reductions in end-use consumption occur in the electric generation and industrial sectors, with gas consumption reductions in 2025 of 14 percent (1.1 tcf) and 2 percent (0.2 tcf), respectively.

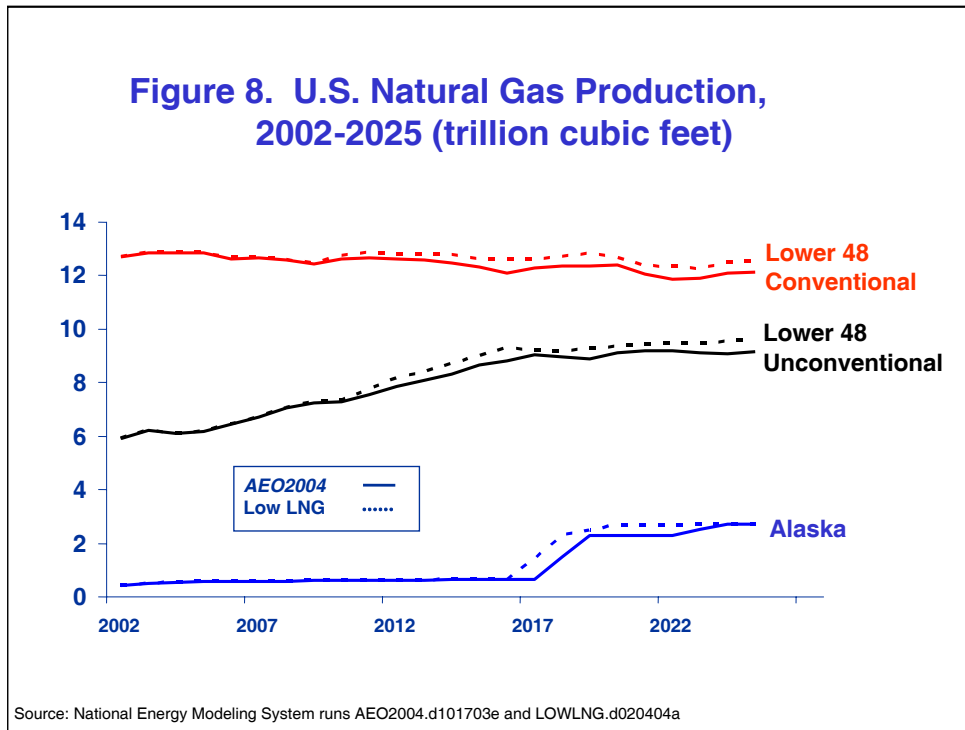
## Low Liquefied Natural Gas Case and *AEO2004* Reference Case



The low LNG case assumes that two new LNG import facilities of 1 billion cubic feet per day each are built on the Gulf Coast and one 500-million-cubic-feet-per-day facility is built in the Bahamas to serve Florida. In the reference case, 9 to 12 new import terminals are built serving the Atlantic and Gulf Coasts. Construction of LNG terminals in Baja California, Mexico, is allowed in both cases.

The low LNG case causes net Canadian gas exports to the United States to increase, and Mexico becomes a net exporter of gas to the United States by the end of the forecast period, compared to being a net importer of gas in the reference case. In 2025, gas exports from Canada are projected to be 2.8 tcf in the low LNG case, compared to 2.6 tcf in the reference case (Figure 7). In 2025, the low LNG case projects 30 bcf of Mexican gas exports to the United States, compared to 120 bcf of Mexican gas imports from the United States in the reference case.

## Low Liquefied Natural Gas Case and *AEO2004* Reference Case



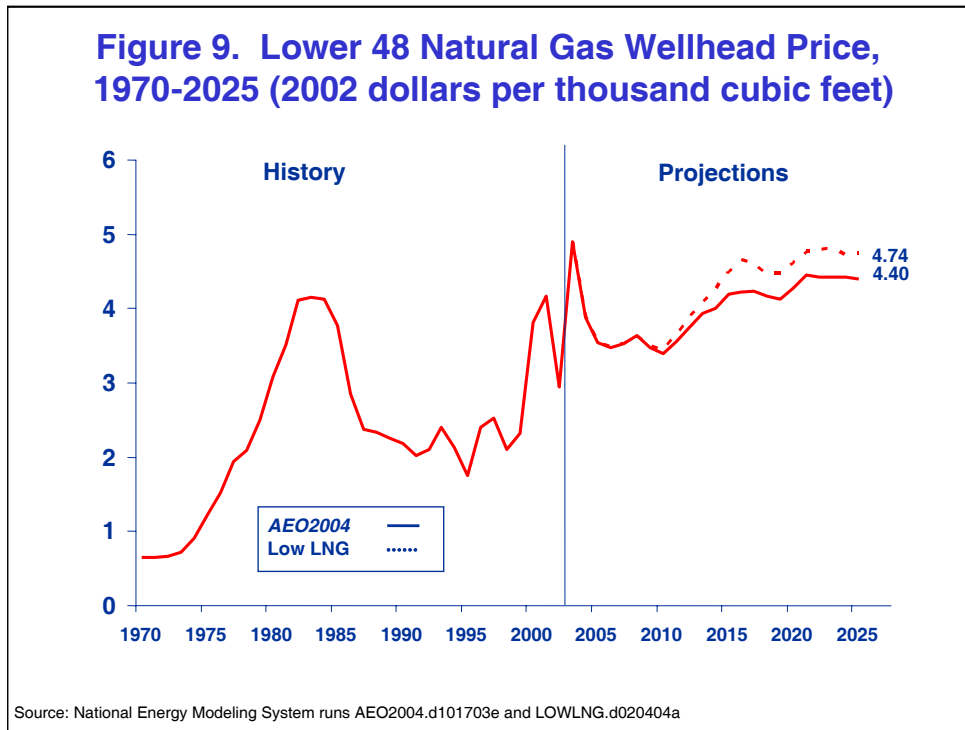
The low LNG case increases gas production for all major domestic gas supply sources, compared to the *AEO2004* reference case.

With respect to Alaska, the higher gas prices projected for the low LNG case stimulate an earlier construction of the Alaska North Slope pipeline, so that it is projected to become operational in 2017, 1 year earlier than in the reference case.

In the lower 48 States, unconventional gas production is projected to reach 9.6 tcf in 2025, compared to 9.2 tcf in the reference case. Similarly, lower 48 conventional gas production is projected to be 12.5 tcf in 2025 in the low LNG case, compared to 12.1 tcf in the reference case (Figure 8).



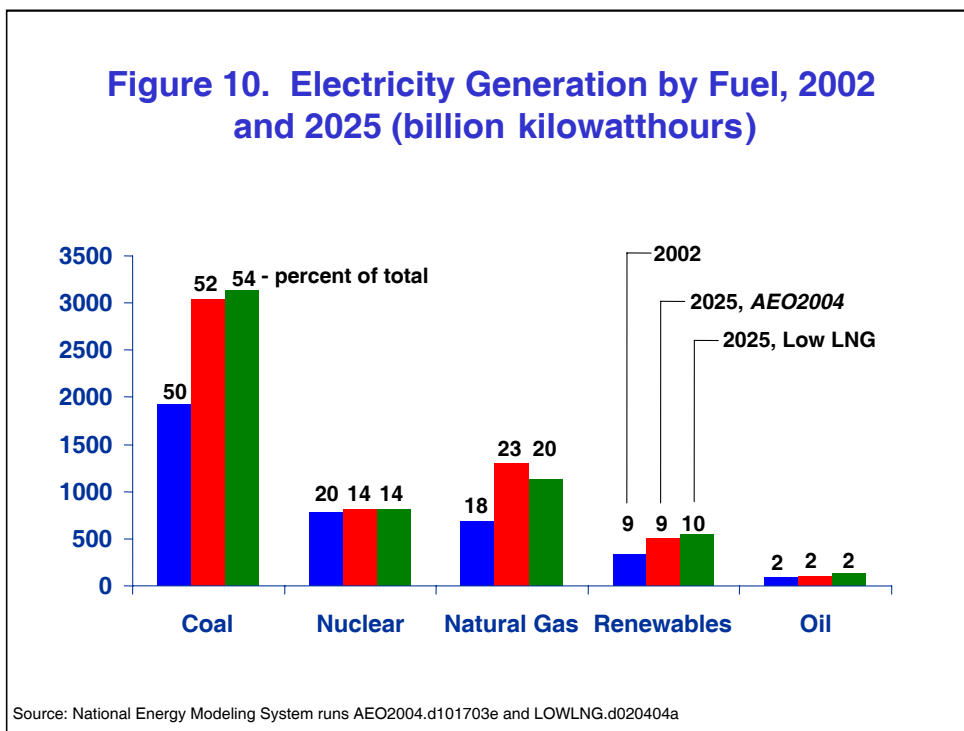
## Low Liquefied Natural Gas Case and AEO2004 Reference Case



Because the low LNG case limits future gas supply more than the no Alaska pipeline case and for a longer period of time, natural gas wellhead prices are higher in this case and for a more sustained period of time.

The wellhead price for the low LNG case starts to rise above reference case prices around 2010, and by 2025 the low LNG case projects wellhead gas prices of \$4.74 per mcf (in 2002 dollars), compared to \$4.40 per mcf for the reference case (Figure 9). The price pattern in the low LNG case is similar to that in the reference case.

## Low Liquefied Natural Gas Case and *AEO2004* Reference Case

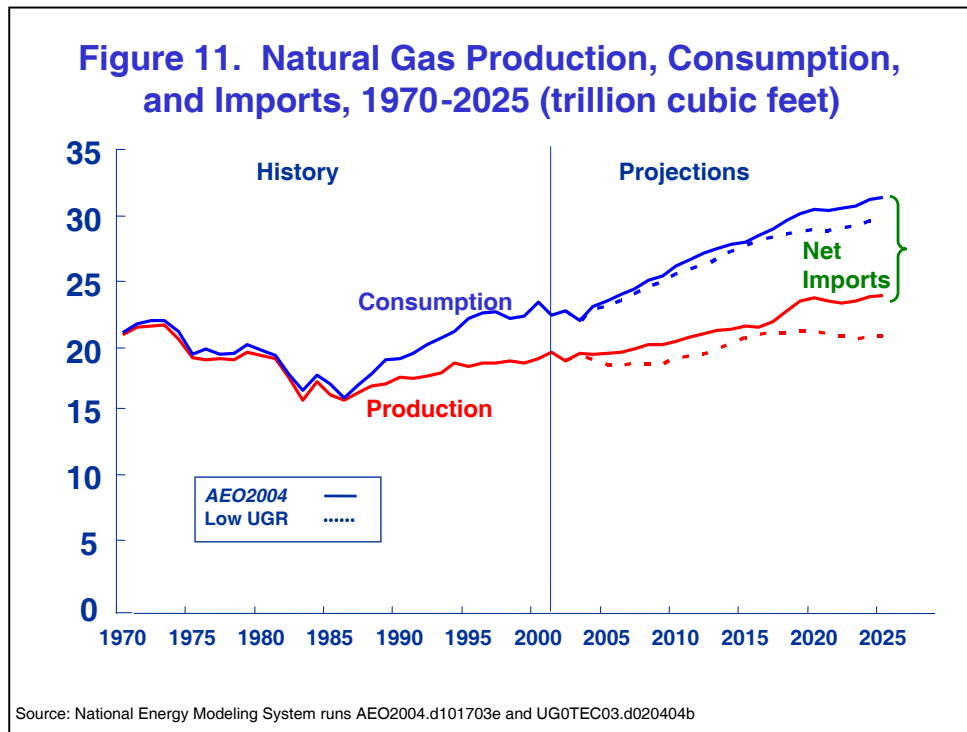


In the low LNG case, the higher wellhead gas prices, which extend over a longer period of time, are projected to result in a larger difference in gas-fired electricity generation than the no Alaska pipeline case. In 2025, gas-fired electricity generation is projected to be 1,130 billion kilowatthours in the low LNG case, compared to 1,304 billion kilowatthours in the reference case (Figure 10).

In the low LNG case, the lower gas-fired electricity generation is partly offset by higher coal and renewable energy electricity generation. In 2025, the low LNG case projects 3,127 billion kilowatthours of coal-fired electricity generation, compared to 3,029 billion kilowatthours in the reference case. Similarly, renewable energy electricity generation is projected to be 542 billion kilowatthours in 2025, compared to 509 billion kilowatthours for the reference case. Cumulatively from 2002 through 2025, wind generation accounts for 82 percent of the increase in total renewable generation. Biomass generation comprises most of the remainder.

As in the no Alaska pipeline case, the higher wellhead gas price in the low LNG case does not translate into significantly higher busbar electricity prices, because the change in 2025 wellhead prices is limited to 34 cents per mcf and the fact that gas-fired electricity generation is only 20 percent of total U.S. generation. In 2025, the electricity price is projected to be 6.94 cents per kilowatthour in the low LNG case, compared to 6.91 cents per kilowatthour in the reference case. While this electricity price in 2025 is similar to the price in the previous case, electricity prices are higher earlier in this case due to the higher costs incurred earlier for constructing coal-fired and renewable technologies.

## Low Unconventional Gas Recovery Case and *AEO2004* Reference Case

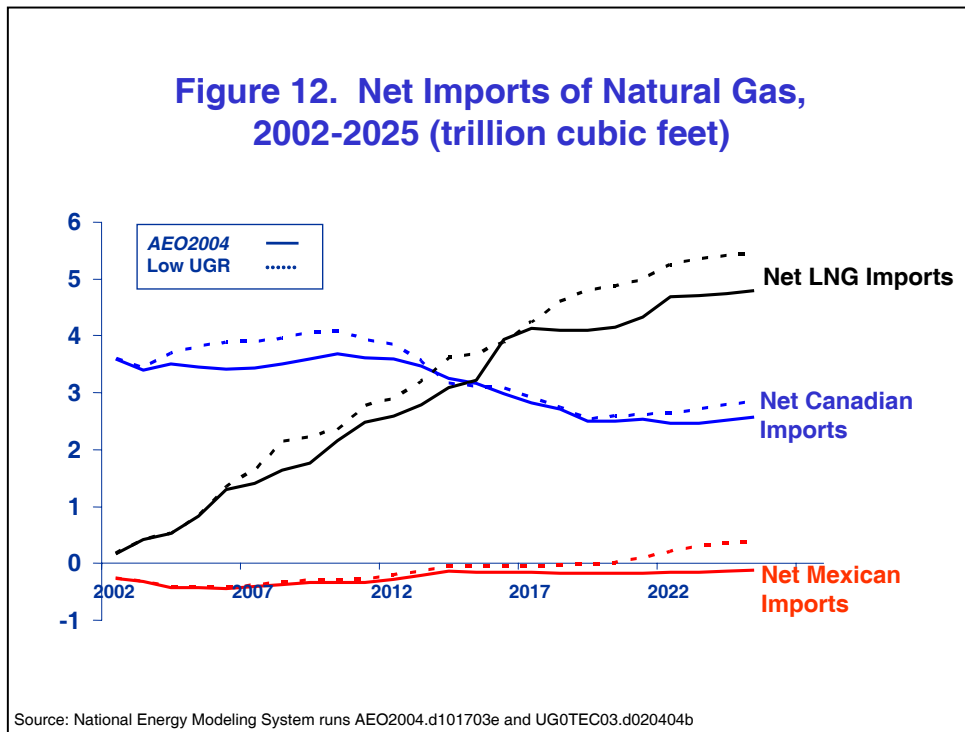


The low UGR case is designed to restrict unconventional gas production approximately to the 2002 level (e.g., 5.7 tcf in 2025, compared to 9.2 tcf in the reference case). In 2025, the net loss in unconventional gas supplies is 3.5 tcf, which makes this case more restrictive than the prior two cases.

Relative to the *AEO2004* reference case, the low UGR case is projected to cause a 5-percent (1.7 tcf) decline in 2025 gas consumption (Figure 11). Although 2025 unconventional gas production is 3.5 tcf lower than the reference case, the net gas production loss in 2025 is only 3.2 tcf, because other gas supply sources increase, offsetting the lower unconventional gas production. Because lower gas consumption and low overall gas production are not projected to compensate for the loss of unconventional gas production, net gas imports are 20 percent higher (1.4 tcf) in 2025 in the low UGR case, than in the reference case.

The largest reductions in end-use consumption occur in the electric generation and industrial sectors, with gas consumption reductions in 2025 of 13 percent (1.1 tcf) and 2 percent (0.2 tcf), respectively.

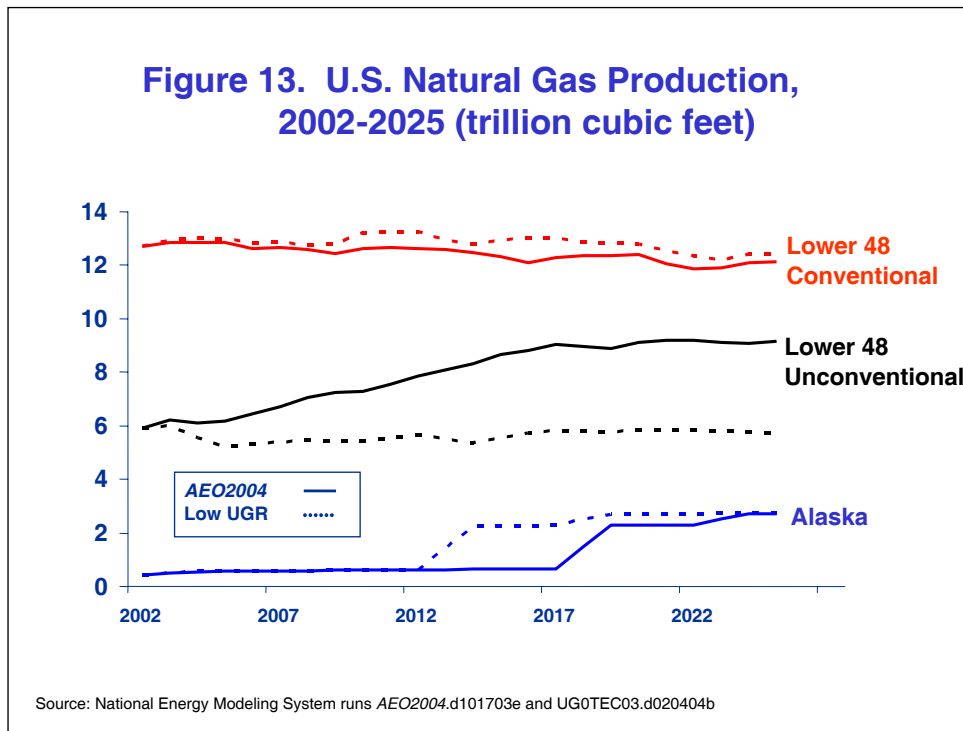
## Low Unconventional Gas Recovery Case and *AEO2004* Reference Case



The increase in net gas imports, as projected for the low UGR case, is distributed among the three major foreign gas supply sources: LNG, Canadian gas, and Mexican gas.

In 2025, net LNG imports are projected at 5.4 tcf in the low UGR case, compared to the 4.8 tcf projected in the reference case (Figure 12). Similarly, net Canadian gas imports are projected to be 2.9 tcf in 2025, compared to the 2.6 tcf in the reference case. Finally, 2025 net Mexican gas exports to the United States are projected to be 390 bcf in the low UGR case, compared to 120 bcf of Mexican gas imports from the United States in the reference case. In the low UGR case, Baja California, Mexico, supplies the western United States with 550 bcf of LNG via a pipeline in 2025, 180 bcf more than in the reference case. Because this case restricts natural gas supply well beyond historical experience, it may not fully represent market conditions. So, it is possible that even more gas could be imported from LNG facilities in Canada and Mexico.

## Low Unconventional Gas Recovery Case and *AEO2004* Reference Case

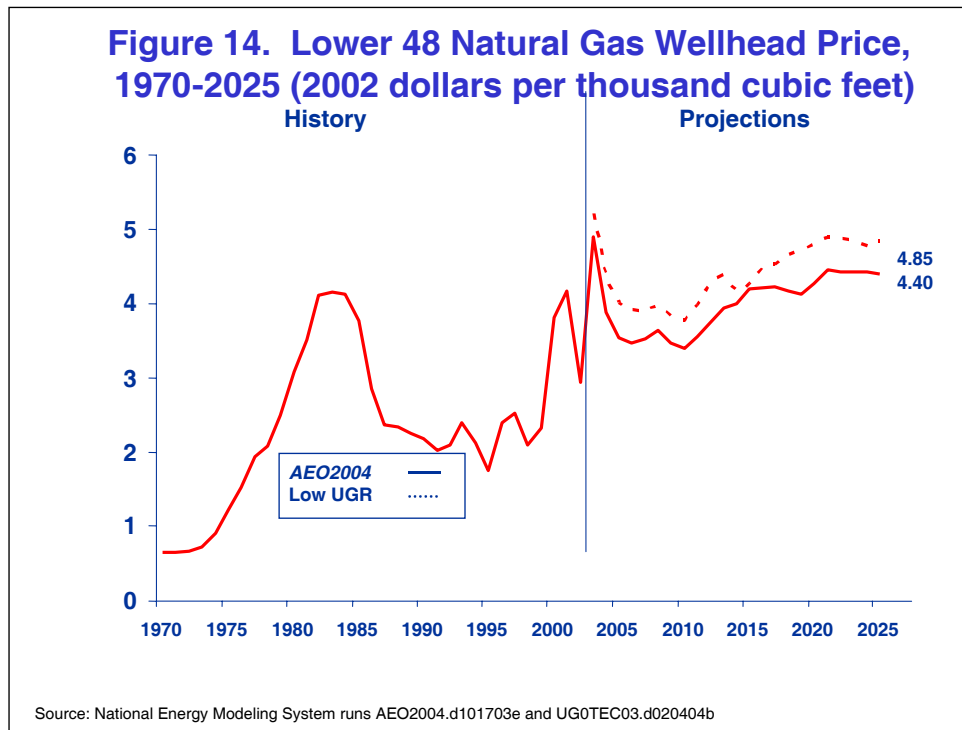


By assumption, unconventional gas production in the future remains around its 2002 production level in this case. In the period spanning 2002 through 2015, the lower 48 unconventional gas production is projected to be about 0.5 tcf per year below the 2002 level. After 2015, unconventional gas production is projected to be about 0.2 tcf below the 2002 level (Figure 13).

Under the low UGR case, the net loss of unconventional gas production amounts to 3.5 tcf in 2025. This loss in lower 48 gas supply causes wellhead gas prices to be higher throughout the forecast, which in turn initiates the earlier construction of an Alaska gas pipeline to the lower 48. In the low UGR case, the Alaska gas pipeline is projected to begin operation in 2013, which is 5 years earlier than the reference case projection. The capacity expansion of this pipeline is also projected to occur in 2018, which is 5 years earlier than in the reference case.

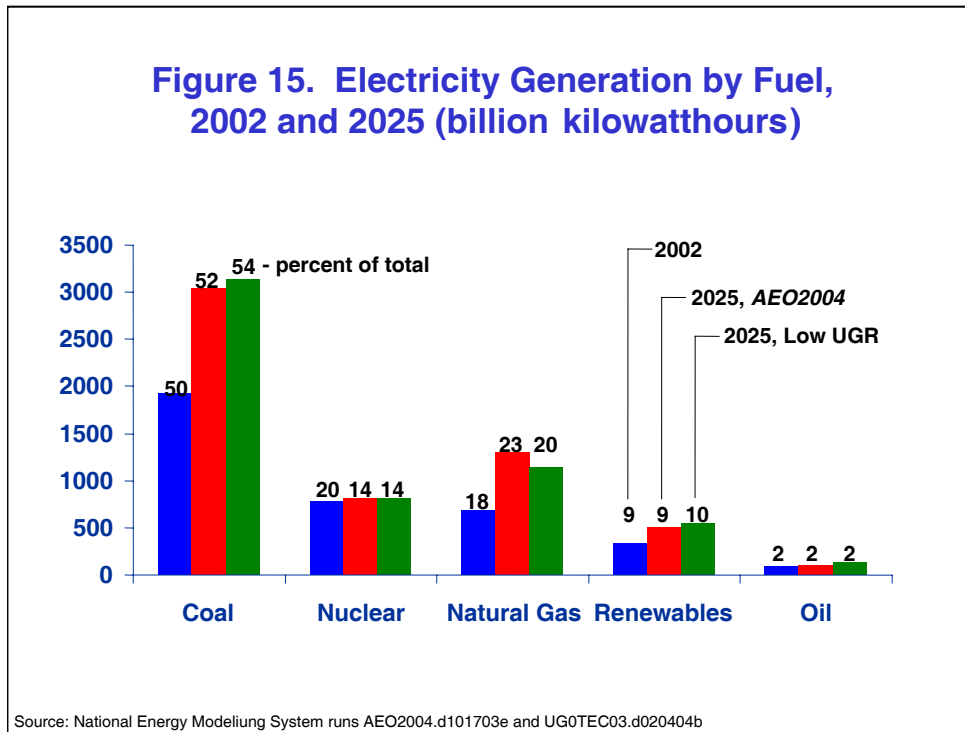
In the low UGR case, lower 48 conventional gas production is projected to be higher throughout the forecast period. The primary impact of the higher conventional gas production is projected to occur earlier in the forecast rather than later. For example, in 2015, the lower 48 conventional gas production is projected to be 0.6 tcf higher in the low UGR case than in the reference case. In 2025, however, the incremental lower 48 conventional gas production amounts to 0.3 tcf. This smaller increment in lower 48 conventional gas production in 2025 is due to a rapid escalation in the cost of producing this gas, which comes as a result of the considerable depletion of this gas resource by 2025.

## Low Unconventional Gas Recovery Case and AEO2004 Reference Case



Because the low UGR case is a more severe gas supply case than the prior two supply cases, this scenario projects a greater wellhead price impact. Figure 14 compares the projected wellhead gas prices for the low UGR and reference cases in 2002 dollars per mcf. Prices respond immediately in the low UGR case because it is assumed that less gas is ultimately available for production.

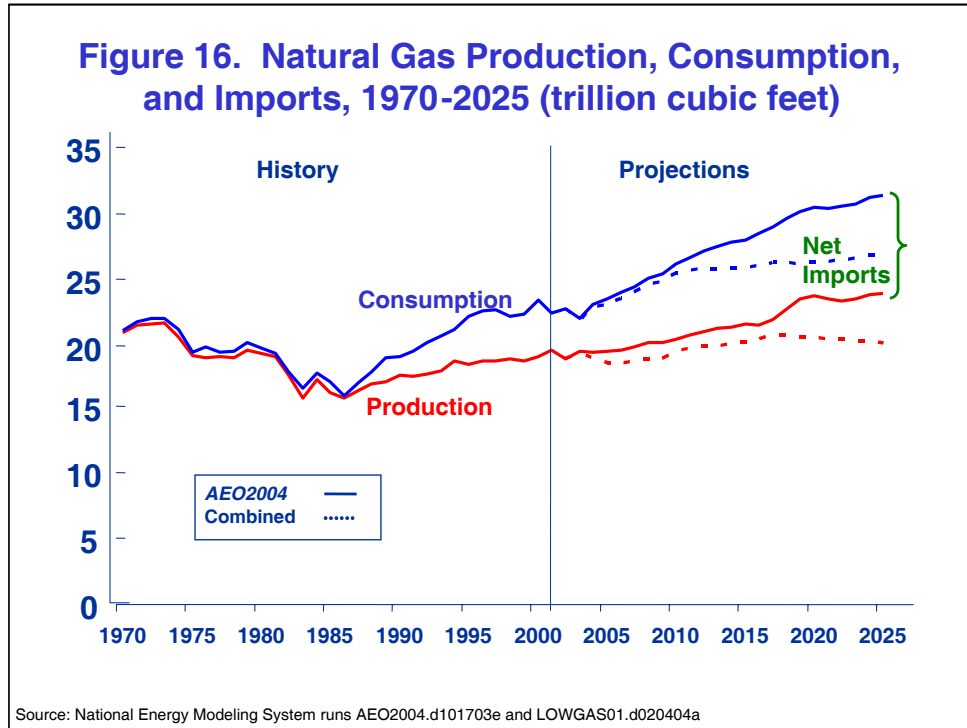
## Low Unconventional Gas Recovery Case and *AEO2004* Reference Case



Because the low UGR case causes wellhead gas prices to be significantly higher, less new gas-fired electric power capacity is built throughout the forecast, resulting in less gas-fired electricity generation. In the low UGR case, gas-fired generation is projected to be 1,133 billion kilowatthours in 2025, compared to the 1,304 billion kilowatthours in the reference case (Figure 15). Coal-fired generation gains the most by the restriction on natural gas supply. In the low UGR case, coal-fired electricity generation is projected to be 3,127 billion kilowatthours in 2025, compared to 3,029 in the reference case. Renewable energy power generation is also higher in 2025, 538 billion kilowatthours in the low UGR case compared to 509 billion kilowatthours in the reference case. Cumulatively from 2002 through 2025, wind generation accounts for 88 percent of the increase in total renewable generation. Biomass generation comprises most of the remainder.

Busbar electricity prices in 2025 are about the same in the low UGR case as they are in the other two cases, 6.93 cents per kilowatthour (2002 dollars). The change in wellhead gas prices is minimized in the low UGR case because less gas-fired electricity is produced and gas-fired generation is only 20 percent of total electricity generation.

## Combined Case and AEO2004 Reference Case

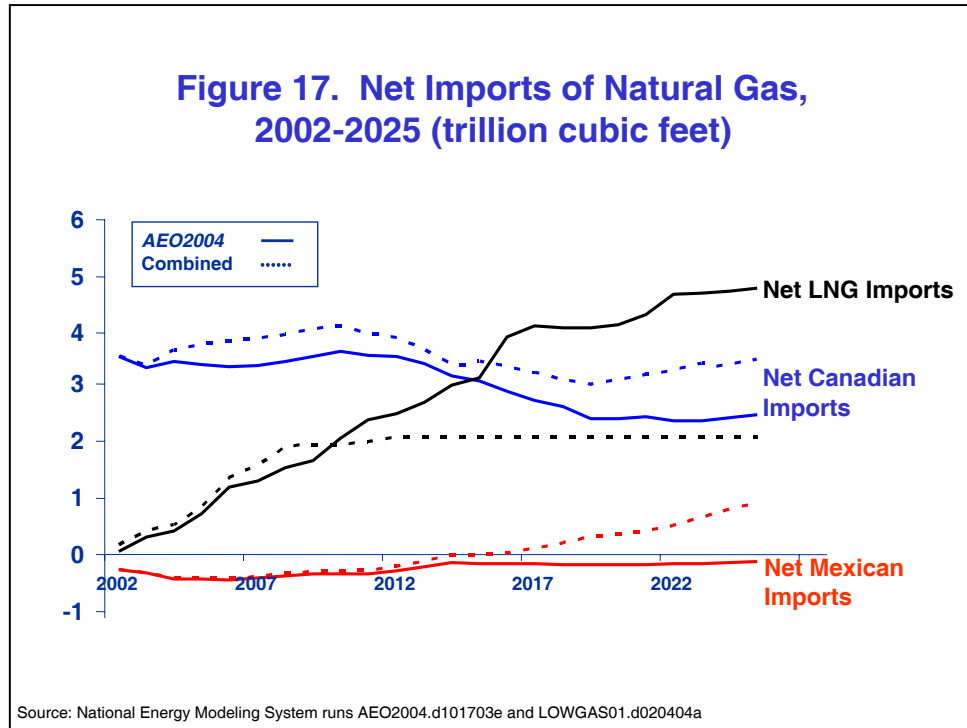


Because the combined case integrates the gas supply restrictions imposed in the other three cases, it is by far the most restrictive of the four examined. This is best illustrated by the reduction in projected natural gas consumption. In 2025, the combined case projects total gas consumption to be 26.9 tcf, compared to 31.4 tcf in the reference case, which is a 14-percent reduction (4.5 tcf). In 2025, domestic gas production is projected to be 3.8 tcf lower in the combined case than in the reference case, while net gas imports are 0.7 tcf lower in the combined case (Figure 16).

The largest reductions in end-use consumption occur in the electric generation and industrial sectors, with gas consumption reductions in 2025 of 36 percent (3.0 tcf) and 7 percent (0.7 tcf), respectively. Because this case restricts natural gas supply well beyond historical experience, it may not fully represent market conditions. So, the high sustained gas prices in this case might lead to more energy conservation and even the departure of gas-reliant manufacturing from the United States.

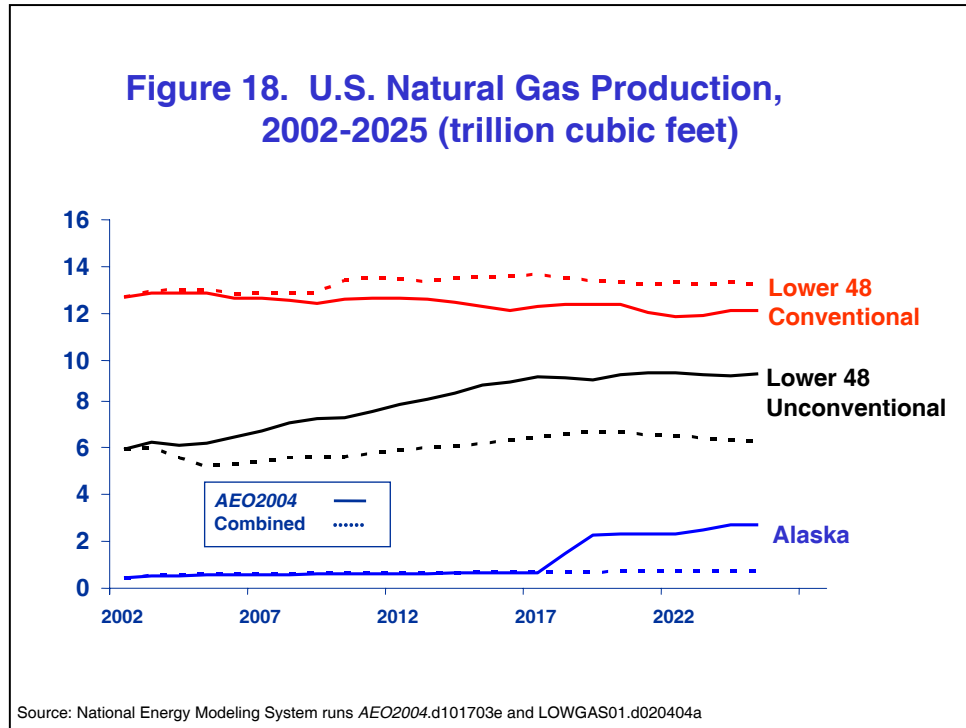


## Combined Case and AEO2004 Reference Case



Although net LNG imports are constrained in the combined case, gas imports from Mexico and Canada are not constrained. Consequently, these pipeline imports are much higher in the combined case than the reference case projection. In 2025, gas exports from Canada are projected to be 3.5 tcf in the combined case, compared to the 2.6 tcf in the reference case (Figure 17). Mexico exports 0.9 tcf to the United States in 2025 in the combined case, compared to the 120 bcf of gas it imports from the United States in the reference case. In the combined case, Baja California, Mexico, supplies the western United States with 730 bcf of LNG via a pipeline in 2025, 360 bcf more than in the reference case. It is also possible that even more gas could be imported from LNG facilities in Canada and Mexico.

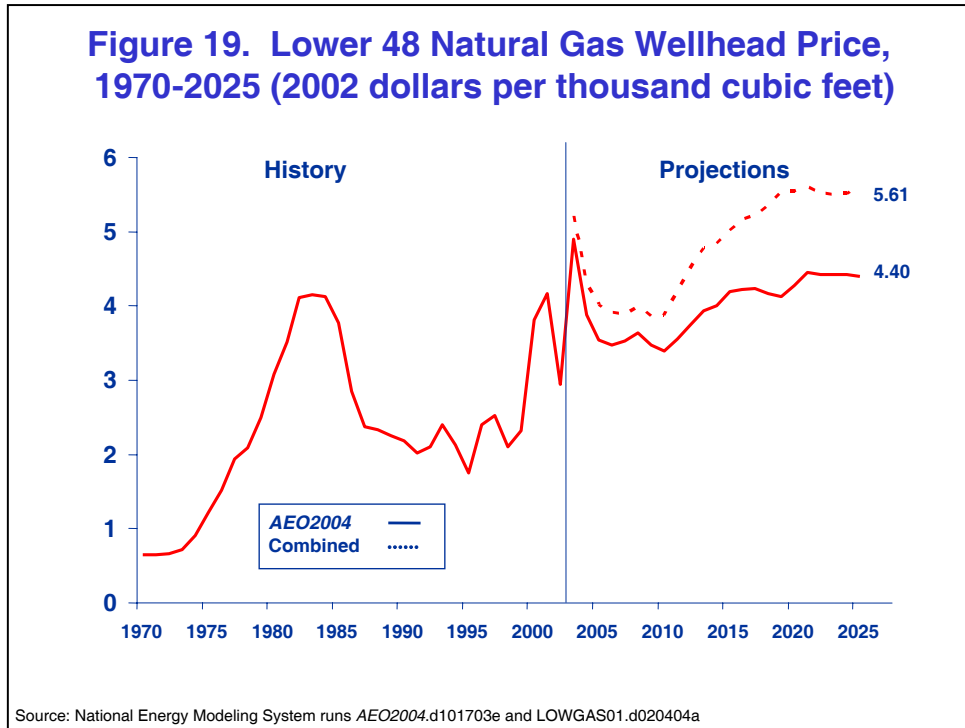
## Combined Case and AEO2004 Reference Case



In considering the combined case, it should be noted that unconventional gas supplies are not restricted to a specific and constant level. The assumed changes to unconventional gas supply make these sources of gas more expensive to produce. In the combined case, unconventional gas production is above the 2002 level, because wellhead gas prices are projected to exceed the higher cost of developing unconventional supplies, sufficient to induce an incremental supply response. Incremental unconventional gas production peaks in 2019, when it is 0.7 tcf above the 2002 level, and then subsides through 2025, when it is 0.4 tcf above the 2002 level (Figure 18). Relative to the reference case, unconventional gas production in 2025 is 2.9 tcf lower in the combined case (9.2 tcf in the reference case and 6.3 tcf in the combined case).

Because Alaska gas and unconventional gas supplies are severely constrained in the combined case, only lower 48 conventional gas can be a large incremental source of domestic gas production. In 2025, lower 48 conventional gas production is projected to be 13.2 tcf in the combined case, compared to 12.1 tcf in the reference case. Production is only 1.1 tcf greater in 2025 because conventional resources have been significantly depleted by the end of the forecast, making incremental conventional gas supplies more expensive to develop and produce.

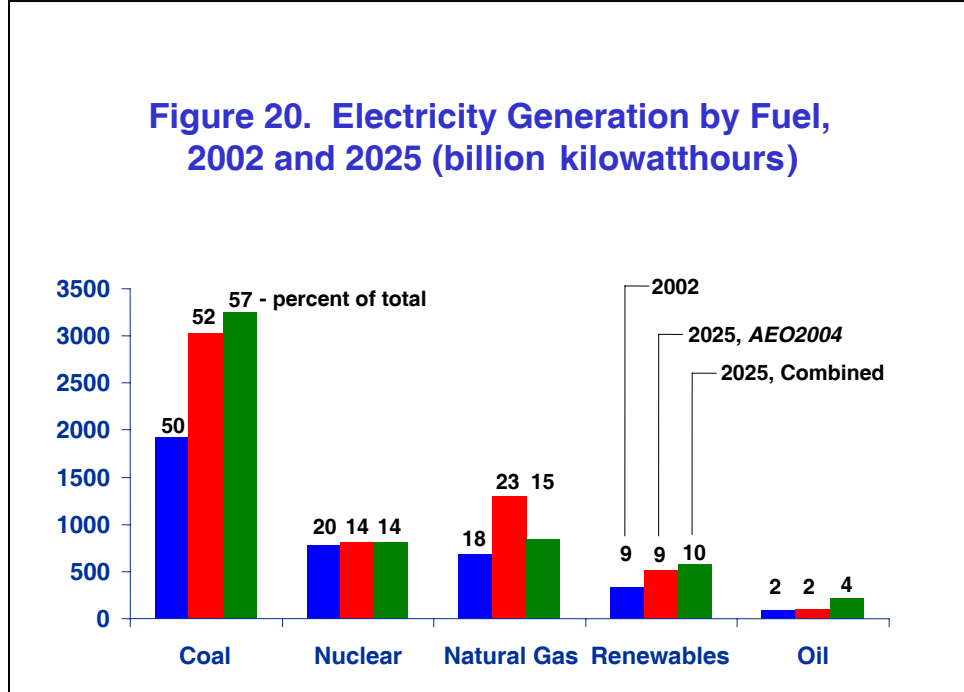
## Combined Case and AEO2004 Reference Case



The severe supply constraints placed on the combined case result in projected prices being considerably higher than in the reference case. Figure 19 compares the wellhead gas prices for the combined and reference cases in 2002 dollars per mcf. In 2025, the wellhead prices in the combined case are 27 percent higher than in the reference case.

These gas prices are average annual prices, which masks both the winter/summer seasonal price variation and the gas price volatility caused by other short-term factors, such as weather severity. Because the combined case represents a significantly more constrained gas supply environment, the difference in winter peaking prices could be considerably greater than that implied by the difference between the average annual prices in the combined and reference cases.

## Combined Case and AEO2004 Reference Case



Source: National Energy Modeling System runs AEO2004.d101703e and LOWGAS01.d020404a

The high wellhead gas prices projected for the combined case significantly reduce the construction and use of gas-fired electricity generation capacity. Projected gas-fired generation in 2025 is marginally greater than the 2002 gas-fired generation levels. In the combined case, gas is projected to generate 848 billion kilowatthours, which is only 162 billion kilowatthours higher than the 686 billion kilowatthours generated in 2002. In 2025, the gas share of the generation market is 15 percent, which is less than the 18 percent experienced in 2002 and the 23 percent projected in the reference case (Figure 20).

As in the other cases, when gas is used less in the electric generation sector, the difference is made up primarily through greater use of coal, renewable energy, and in this case oil. In 2025, coal-fired generation is 3,253 billion kilowatthours in the combined case, which is 224 billion kilowatthours more than that projected in the reference case, raising the coal share of the generation market to 57 percent. Similarly, renewable electricity generation is projected to be 68 billion kilowatthours higher in 2025 in the combined case and oil-fired generation is 121 billion kilowatthours greater. Oil generation increases more than renewable energy generation because dual-fired units that can burn both oil and natural gas switch to oil when gas prices get sufficiently high. Cumulatively from 2002 through 2025, wind generation accounts for 90 percent of the increase in total renewable generation. Biomass generation comprises most of the remainder.


The combined case exhibits a significant change in electricity prices, unlike the other three cases. In 2025, the combined case projects a busbar electricity price of 7.13 cents per kilowatthour, compared to the reference case price of 6.91 cents per kilowatthour, a 3-percent increase.

## **Appendix A**

### **Request Letter from Representative Cubin**

RICHARD W. POMBO, CA  
*Chairman*  
 DON YOUNG, AK  
 W.J. "BILLY" TAUZIN, LA  
 JIM SAXTON, NJ  
 ELTON GALLEGLY, CA  
 JOHN J. DUNCAN, JR., TN  
 WAYNE T. GILCHREST, MD  
 KEN CALVERT, CA  
 SCOTT MCINNIS, CO  
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 RICK RENZI, AZ  
 TOM COLE, OK  
 STEVAN PEARCE, NM  
 ROB BISHOP, UT  
 DEVIN NUNES, CA  
**VACANCY**

STEVEN J. DING  
*Chief of Staff*



**U.S. House of Representatives**  
**Committee on Resources**  
 Washington, DC 20515

February 3, 2004

NICK J. RAHALL II, WV  
*Ranking Democrat Member*  
 DALE E. KILDEE, MI  
 ENI F.H. FALEOMAVAEGA, AS  
 NEIL AMERSCROMBIE, HI  
 SOLOMON P. ORTIZ, TX  
 FRANK PALLONE, JR., NJ  
 CALVIN M. DOOLEY, CA  
 DONNA M. CHRISTENSEN, VI  
 RON KIND, WI  
 JAY INSLEE, WA  
 GRACE F. NAPOLITANO, CA  
 TOM UDALL, NM  
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 EDWARD J. MARKEY, MA  
 RUBEN HINOJOSA, TX  
 CIRO D. RODRIGUEZ, TX  
 JOE BACA, CA  
 BETTY MCCOLLUM, MN

JAMES H. ZOIA  
*Democratic Staff Director*

Mr. Howard K. Gruenspecht, Ph.D.  
 Deputy Administrator  
 Energy Information Administration  
 1000 Independence Ave., S.W.  
 Washington DC 20585

Dear Dr. Gruenspecht:

Thank you for taking the time to brief the House Resources Committee on the latest Annual Energy Outlook. There is some additional information that I would like EIA to provide the Committee.

Several graphs in your presentation depict U.S. energy production, consumption and price through 2025. I would like to see those graphs as well as the raw data based on additional assumptions listed below.

- 1) No increased availability of Alaska natural gas.
- 2) No significant increase in production of tight sand (or other non-conventional sources) natural gas.
- 3) Inability to permit more than three additional average sized LNG offloading facilities.

If you have any questions, please contact Jack Belcher of the Energy and Mineral Resources Subcommittee at (202) 225-9297.

Sincerely,



Barbara Cubin  
 Chairman  
 Subcommittee on Energy and Mineral Resources

cc: Mary J. Hutzler  
 Robert L. Tuttle  
 Kathy Peery

<http://www.resourcescommittee.house.gov>

## **Appendix B**

### **Comparison of *AEO2004* and Restricted Natural Gas Supply Cases**

**Table B1. Electricity Supply, Disposition, Prices, and Emissions**  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2015					2020					2025				
	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined
	<b>Generation by Fuel Type</b>														
<b>Electric Power Sector<sup>1</sup></b>															
<b>Power Only<sup>2</sup></b>															
Coal .....	2318	2312	2314	2313	2334	2560	2557	2584	2581	2638	2975	2999	3073	3073	3199
Petroleum .....	103	103	138	123	201	82	105	124	134	284	77	83	112	108	191
Natural Gas <sup>3</sup> .....	814	816	769	771	640	972	939	871	845	598	969	926	813	818	564
Nuclear Power .....	812	812	812	812	812	816	816	816	816	816	816	816	816	816	816
Pumped Storage/Other .....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources <sup>4</sup> .....	420	424	422	437	437	442	440	459	472	491	460	464	493	489	528
Distributed Generation (Natural Gas) .....	1	1	1	1	1	3	3	3	3	2	5	5	5	5	3
Non-Utility Generation for Own Use .....	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
<b>Total .....</b>	<b>4423</b>	<b>4421</b>	<b>4409</b>	<b>4411</b>	<b>4378</b>	<b>4829</b>	<b>4814</b>	<b>4811</b>	<b>4806</b>	<b>4784</b>	<b>5257</b>	<b>5247</b>	<b>5266</b>	<b>5263</b>	<b>5256</b>
<b>Combined Heat and Power<sup>5</sup></b>															
Coal .....	34	34	34	34	34	33	34	33	34	33	33	33	33	33	33
Petroleum .....	5	5	7	5	12	2	4	5	5	14	2	3	4	4	9
Natural Gas .....	165	166	164	168	154	159	159	155	140	149	148	141	142	131	
Renewable Sources .....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Non-Utility Generation for Own Use .....	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
<b>Total .....</b>	<b>183</b>	<b>184</b>	<b>184</b>	<b>187</b>	<b>180</b>	<b>175</b>	<b>176</b>	<b>177</b>	<b>174</b>	<b>167</b>	<b>164</b>	<b>164</b>	<b>159</b>	<b>159</b>	<b>153</b>
<b>Net Available to the Grid .....</b>	<b>4606</b>	<b>4606</b>	<b>4592</b>	<b>4597</b>	<b>4558</b>	<b>5004</b>	<b>4990</b>	<b>4988</b>	<b>4980</b>	<b>4951</b>	<b>5421</b>	<b>5410</b>	<b>5424</b>	<b>5422</b>	<b>5409</b>
<b>End-Use Sector Generation</b>															
<b>Combined Heat and Power<sup>6</sup></b>															
Coal .....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum .....	15	15	16	15	18	17	18	18	18	19	18	18	18	18	19
Natural Gas .....	129	128	127	124	121	153	152	148	146	135	181	179	171	168	150
Other Gaseous Fuels <sup>7</sup> .....	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13
Renewable Sources <sup>4</sup> .....	45	45	45	45	45	50	50	50	50	49	54	54	54	54	54
Other <sup>8</sup> .....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
<b>Total .....</b>	<b>231</b>	<b>231</b>	<b>232</b>	<b>227</b>	<b>227</b>	<b>264</b>	<b>263</b>	<b>260</b>	<b>258</b>	<b>248</b>	<b>299</b>	<b>296</b>	<b>288</b>	<b>286</b>	<b>268</b>
Other End-Use Generators <sup>9</sup> .....	5	5	5	5	5	5	5	5	5	6	7	7	7	7	7
Generation for Own Use .....	-173	-173	-172	-171	-169	-190	-189	-188	-186	-182	-210	-209	-205	-203	-196
<b>Total Sales to the Grid .....</b>	<b>63</b>	<b>64</b>	<b>64</b>	<b>61</b>	<b>63</b>	<b>80</b>	<b>80</b>	<b>78</b>	<b>77</b>	<b>72</b>	<b>95</b>	<b>94</b>	<b>90</b>	<b>89</b>	<b>80</b>
<b>Total Electricity Generation .....</b>	<b>4904</b>	<b>4903</b>	<b>4891</b>	<b>4891</b>	<b>4851</b>	<b>5335</b>	<b>5321</b>	<b>5315</b>	<b>5304</b>	<b>5266</b>	<b>5787</b>	<b>5775</b>	<b>5780</b>	<b>5775</b>	<b>5746</b>
<b>Net Imports .....</b>	<b>32</b>	<b>32</b>	<b>33</b>	<b>33</b>	<b>36</b>	<b>21</b>	<b>23</b>	<b>21</b>	<b>23</b>	<b>27</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>
<b>Electricity Sales by Sector</b>															
Residential .....	1531	1531	1527	1528	1518	1641	1638	1635	1633	1622	1747	1744	1744	1744	1735
Commercial .....	1653	1653	1648	1645	1634	1828	1823	1819	1815	1799	2003	1998	1999	1995	1979
Industrial .....	1216	1216	1214	1217	1205	1310	1306	1308	1306	1306	1422	1418	1426	1426	1428
Transportation .....	29	29	29	29	29	32	32	32	32	32	35	35	35	35	35
<b>Total .....</b>	<b>4429</b>	<b>4428</b>	<b>4418</b>	<b>4419</b>	<b>4387</b>	<b>4811</b>	<b>4799</b>	<b>4794</b>	<b>4786</b>	<b>4759</b>	<b>5207</b>	<b>5195</b>	<b>5204</b>	<b>5201</b>	<b>5177</b>
<b>End-Use Prices<sup>10</sup></b> (2002 cents per kilowatthour)															
Residential .....	8.1	8.1	8.2	8.2	8.4	8.1	8.2	8.3	8.3	8.6	8.1	8.2	8.2	8.2	8.4
Commercial .....	7.2	7.2	7.3	7.3	7.5	7.2	7.4	7.5	7.4	7.8	7.3	7.4	7.4	7.4	7.6
Industrial .....	4.7	4.7	4.8	4.8	5.0	4.8	4.9	4.9	4.9	5.2	4.8	4.8	4.8	4.8	5.0
Transportation .....	6.9	6.9	7.0	7.0	7.2	6.8	7.0	7.0	7.0	7.2	6.8	6.8	6.8	6.8	7.0
<b>All Sectors Average .....</b>	<b>6.8</b>	<b>6.8</b>	<b>6.9</b>	<b>6.9</b>	<b>7.1</b>	<b>6.9</b>	<b>7.0</b>	<b>7.0</b>	<b>7.0</b>	<b>7.3</b>	<b>6.9</b>	<b>6.9</b>	<b>6.9</b>	<b>6.9</b>	<b>7.1</b>
<b>Prices by Service Category<sup>10</sup></b> (2002 cents per kilowatthour)															
Generation .....	4.4	4.4	4.5	4.4	4.7	4.5	4.6	4.6	4.6	4.9	4.5	4.6	4.6	4.6	4.7
Transmission .....	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution .....	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7



**Table B1. Electricity Supply, Disposition, Prices, and Emissions (Continued)**  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2015					2020					2025				
	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined
	<b>Electric Power Sector Emissions<sup>1</sup></b>														
Sulfur Dioxide (million tons) . . . . .	8.95	8.95	8.99	9.04	9.03	8.94	8.95	8.94	8.93	8.95	8.95	8.94	8.96	8.95	8.94
Nitrogen Oxide (million tons) . . . . .	3.60	3.60	3.60	3.60	3.61	3.67	3.67	3.67	3.65	3.67	3.75	3.75	3.73	3.72	3.73
Mercury (tons) . . . . .	52.65	52.35	52.95	52.93	53.40	53.59	53.34	53.77	53.94	54.77	54.37	54.48	54.83	54.83	56.28

<sup>1</sup>Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
<sup>2</sup>Includes plants that only produce electricity.  
<sup>3</sup>Includes electricity generation from fuel cells.  
<sup>4</sup>Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.  
<sup>5</sup>Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).  
<sup>6</sup>Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.  
<sup>7</sup>Other gaseous fuels include refinery and still gas.  
<sup>8</sup>Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur and miscellaneous technologies.  
<sup>9</sup>Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.  
<sup>10</sup>Prices represent average revenue per kilowatthour.  
 Note: Totals may not equal sum of components due to independent rounding. Data for 2002 are model results and may differ slightly from official EIA data reports.  
 Source: 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), *Annual Energy Review 2001*, DOE/EIA-0384(2001) (Washington, DC, October 2002), and supporting databases. 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, *Transportation Energy Data Book 21* (Oak Ridge, TN, September 2001). 2002 prices: EIA, National Energy Modeling System run AEO2004.D101703E. **Projections:** EIA, AEO2004 National Energy Modeling System runs AEO2004.D101703E, NOAK.D012604B, LOWLNG.D020404A, UGOTEC03.D020404B, and LOWGAS01.D020404A.

**Table B2. Natural Gas Supply and Disposition**  
(Trillion Cubic Feet per Year)

Supply and Disposition	2015					2020					2025				
	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined
	<b>Production</b>														
Dry Gas Production <sup>1</sup>	21.62	21.64	22.23	20.72	20.30	23.79	22.46	24.71	21.26	20.60	23.99	22.66	24.86	20.81	20.18
Supplemental Natural Gas <sup>2</sup>	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports</b>	<b>6.24</b>	<b>6.24</b>	<b>5.20</b>	<b>6.74</b>	<b>5.48</b>	<b>6.47</b>	<b>7.19</b>	<b>4.67</b>	<b>7.46</b>	<b>5.50</b>	<b>7.24</b>	<b>7.87</b>	<b>4.95</b>	<b>8.67</b>	<b>6.52</b>
Canada	3.17	3.16	3.25	3.11	3.41	2.51	2.65	2.70	2.59	3.07	2.56	2.75	2.84	2.85	3.54
Mexico	-0.15	-0.15	-0.13	-0.06	-0.01	-0.18	-0.16	-0.11	0.01	0.36	-0.12	-0.00	0.03	0.39	0.90
Liquefied Natural Gas	3.22	3.22	2.08	3.68	2.08	4.14	4.70	2.08	4.87	2.08	4.80	5.12	2.08	5.43	2.08
<b>Total Supply</b>	<b>27.95</b>	<b>27.97</b>	<b>27.52</b>	<b>27.56</b>	<b>25.87</b>	<b>30.36</b>	<b>29.74</b>	<b>29.48</b>	<b>28.82</b>	<b>26.20</b>	<b>31.33</b>	<b>30.62</b>	<b>29.90</b>	<b>29.58</b>	<b>26.80</b>
<b>Consumption by Sector</b>															
Residential	5.68	5.68	5.63	5.64	5.53	5.92	5.86	5.85	5.81	5.67	6.09	6.06	6.02	6.02	5.87
Commercial	3.62	3.62	3.58	3.58	3.49	3.83	3.79	3.77	3.74	3.60	4.04	4.01	3.97	3.96	3.81
Industrial <sup>3</sup>	8.87	8.87	8.81	8.82	8.64	9.57	9.47	9.41	9.36	9.02	10.29	10.18	10.07	10.05	9.62
Electric Generators <sup>4</sup>	7.64	7.66	7.31	7.36	6.19	8.61	8.38	7.92	7.66	5.82	8.39	8.08	7.25	7.29	5.38
Transportation <sup>5</sup>	0.08	0.08	0.08	0.08	0.08	0.10	0.10	0.10	0.09	0.09	0.11	0.11	0.11	0.11	0.11
Pipeline Fuel	0.70	0.70	0.72	0.72	0.66	0.81	0.72	0.85	0.74	0.67	0.84	0.73	0.87	0.73	0.67
Lease and Plant Fuel <sup>6</sup>	1.44	1.44	1.47	1.44	1.38	1.61	1.50	1.66	1.50	1.42	1.65	1.53	1.69	1.50	1.42
<b>Total</b>	<b>28.03</b>	<b>28.04</b>	<b>27.60</b>	<b>27.63</b>	<b>25.96</b>	<b>30.44</b>	<b>29.82</b>	<b>29.56</b>	<b>28.89</b>	<b>26.29</b>	<b>31.41</b>	<b>30.71</b>	<b>29.98</b>	<b>29.66</b>	<b>26.88</b>
Natural Gas to Liquids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Discrepancy<sup>7</sup></b>	<b>-0.07</b>	<b>-0.07</b>	<b>-0.07</b>	<b>-0.07</b>	<b>-0.09</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.09</b>	<b>-0.09</b>	<b>-0.09</b>	<b>-0.08</b>	<b>-0.08</b>

<sup>1</sup>Marketed production (wet) minus extraction losses.

<sup>2</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

<sup>3</sup>Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

<sup>4</sup>Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

<sup>5</sup>Compressed natural gas used as vehicle fuel.

<sup>6</sup>Represents natural gas used in the field gathering and processing plant machinery.

<sup>7</sup>Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2002 values include net storage injections.

Btu = British thermal unit.

Note: Totals may not equal sum of components due to independent rounding. Data for 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2002 supply values: Energy Information Administration (EIA), *Natural Gas Monthly*, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2002 consumption based on: EIA, *Annual Energy Review 2001*, DOE/EIA-0384(2001) (Washington, DC, October 2002). Projections: EIA, AEO2004 National Energy Modeling System runs AEO2004.D101703E, NOAK.D012604B, LOWLNG.D020404A, UG0TEC03.D020404B, and LOWGAS01.D020404A.

**Table B3. Oil and Gas Supply**

Production and Supply	2015					2020					2025				
	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined	AEO2004	No Alaska Pipeline	Low LNG	Low UGR	Combined
	<b>Crude Oil</b>														
<b>Lower 48 Average Wellhead Price<sup>1</sup> (2002 dollars per barrel) . . . . .</b>															
	24.56	24.56	24.60	24.58	24.74	25.82	25.57	25.81	25.80	25.52	26.72	26.76	26.79	26.77	26.76
<b>Production (million barrels per day)<sup>2</sup></b>															
<b>U.S. Total . . . . .</b>	5.53	5.53	5.54	5.59	5.60	4.95	4.96	4.97	4.95	4.99	4.61	4.65	4.69	4.68	4.78
Lower 48 Onshore . . . . .	2.38	2.38	2.38	2.39	2.39	2.20	2.20	2.20	2.21	2.22	2.04	2.04	2.05	2.05	2.06
Lower 48 Offshore . . . . .	2.21	2.21	2.22	2.27	2.27	2.03	2.04	2.04	2.02	2.05	2.06	2.10	2.13	2.12	2.21
Alaska . . . . .	0.93	0.93	0.93	0.93	0.93	0.72	0.72	0.72	0.72	0.72	0.51	0.51	0.51	0.51	0.51
<b>Lower 48 End of Year Reserves (billion barrels)<sup>2</sup> . . . . .</b>															
	17.13	17.13	17.16	17.32	17.35	16.20	16.19	16.24	16.29	16.19	14.98	15.07	15.18	15.16	15.32
<b>Natural Gas</b>															
<b>Lower 48 Average Wellhead Price<sup>1</sup> (2002 dollars per thousand cubic feet) . . . . .</b>															
	4.19	4.20	4.49	4.28	5.02	4.28	4.52	4.61	4.79	5.53	4.40	4.60	4.74	4.85	5.61
<b>Dry Production (trillion cubic feet)<sup>3</sup></b>															
<b>U.S. Total . . . . .</b>	21.62	21.64	22.23	20.72	20.30	23.79	22.46	24.71	21.26	20.61	23.99	22.66	24.86	20.81	20.18
Lower 48 Onshore . . . . .	16.11	16.13	16.62	13.24	14.35	16.41	16.74	16.95	13.56	14.87	16.26	16.84	17.00	12.99	14.10
Associated-Dissolved <sup>4</sup> . . . . .	1.31	1.31	1.31	1.31	1.31	1.23	1.23	1.23	1.23	1.24	1.17	1.17	1.17	1.17	1.17
Non-Associated . . . . .	14.81	14.82	15.31	11.93	13.04	15.18	15.51	15.72	12.32	13.63	15.09	15.67	15.83	11.83	12.93
Conventional . . . . .	6.13	6.14	6.31	6.40	6.88	6.07	6.14	6.35	6.50	7.02	5.92	6.07	6.21	6.12	6.65
Unconventional . . . . .	8.67	8.68	8.99	5.53	6.16	9.11	9.37	9.36	5.82	6.61	9.16	9.61	9.63	5.71	6.28
Lower 48 Offshore . . . . .	4.87	4.87	4.97	5.23	5.31	5.09	5.04	5.10	5.04	5.06	5.03	5.11	5.15	5.11	5.37
Associated-Dissolved <sup>4</sup> . . . . .	1.33	1.33	1.33	1.35	1.35	1.34	1.34	1.34	1.34	1.33	1.43	1.43	1.44	1.44	1.52
Non-Associated . . . . .	3.54	3.54	3.64	3.88	3.96	3.75	3.71	3.76	3.69	3.73	3.60	3.68	3.70	3.67	3.85
Alaska . . . . .	0.64	0.64	0.64	2.25	0.64	2.29	0.68	2.67	2.67	0.68	2.71	0.71	2.71	2.71	0.72
<b>Lower 48 End of Year Dry Reserves<sup>3</sup> (trillion cubic feet) . . . . .</b>															
	203.74	203.58	203.74	172.08	173.62	200.97	200.56	201.18	164.77	169.56	193.51	193.36	192.72	155.78	156.53
<b>Supplemental Gas Supplies (trillion cubic feet)<sup>5</sup> . . . . .</b>															
	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Total Lower 48 Wells (thousands) . . . . .</b>															
	26.80	26.83	27.66	25.41	27.96	26.83	27.26	27.49	26.56	28.51	26.00	26.73	26.96	25.89	28.19

<sup>1</sup>Represents lower 48 onshore and offshore supplies.  
<sup>2</sup>Includes lease condensate.  
<sup>3</sup>Marketed production (wet) minus extraction losses.  
<sup>4</sup>Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).  
<sup>5</sup>Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.  
 Note: Totals may not equal sum of components due to independent rounding. Data for 2002 are model results and may differ slightly from official EIA data reports.  
 Sources: 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), *Petroleum Supply Annual 2002*, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2002 natural gas lower 48 average wellhead price, Alaska and total natural gas production, and supplemental gas supplies: EIA, *Natural Gas Monthly*, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2002 values: EIA, Office of Integrated Analysis and Forecasting.  
 Projections: EIA, AEO2004 National Energy Modeling System runs AEO2004.D101703E, NOAK.D012604B, LOWLNG.D020404A, UG0TEC03.D020404B, and LOWGAS01.D020404A.

## **Appendix C**

# **Annual Results of the Restricted Natural Gas Supply Cases**

## AEO2004 Reference Case

Table C1. Electricity Supply, Disposition, Prices, and Emissions  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Generation by Fuel Type</b>																								
<b>Electric Power Sector 1/ Power Only 2/</b>																								
Coal.....	1875	1944	1947	2002	2057	2110	2131	2173	2201	2222	2244	2265	2288	2318	2353	2395	2435	2493	2560	2634	2724	2830	2891	2975
Petroleum.....	77	95	51	62	61	64	71	68	62	69	82	88	96	103	101	100	92	87	82	87	82	75	78	77
Natural Gas 3/.....	450	420	504	505	524	537	577	597	642	681	717	755	791	814	854	891	935	961	972	962	959	948	969	969
Nuclear Power.....	780	762	779	791	794	795	796	791	794	800	803	806	809	812	814	816	816	816	816	816	816	816	816	816
Pumped Storage/Other.....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources 4/.....	304	339	374	379	383	389	392	396	400	405	408	412	416	420	423	426	429	434	442	448	450	452	456	460
Distributed Gen (Natural Gas)	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	3	3	4	4	5	5	5
Non-Utility Gen for Own Use..	-34	-39	-40	-40	-40	-40	-40	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
Total.....	3443	3512	3606	3690	3770	3845	3918	3977	4054	4129	4206	4279	4352	4423	4500	4583	4663	4747	4829	4906	4989	5079	5169	5257
<b>Combined Heat and Power 5/</b>																								
Coal.....	32	28	29	30	32	33	33	33	33	33	33	34	34	34	34	33	33	33	33	33	33	33	33	33
Petroleum.....	6	2	0	0	0	1	1	1	1	2	2	3	4	5	4	4	3	3	2	3	3	2	2	2
Natural Gas.....	148	152	157	159	161	166	170	176	174	175	176	173	168	165	165	161	163	161	159	156	154	150	150	149
Renewable Sources.....	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Non-Utility Gen for Own Use..	-11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
Total.....	183	163	166	170	173	180	184	191	188	189	191	189	185	183	183	179	179	177	175	172	169	165	166	164
Net Available to the Grid.....	3626	3674	3773	3860	3944	4025	4102	4167	4242	4318	4397	4468	4538	4606	4683	4762	4842	4924	5004	5077	5159	5244	5335	5421
<b>End-Use Sector Generation</b>																								
<b>Combined Heat and Power 6/</b>																								
Coal.....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum.....	5	5	5	8	9	10	10	11	12	13	13	14	14	15	15	15	16	17	17	17	17	17	17	18
Natural Gas.....	84	84	86	89	94	97	100	105	109	114	118	121	125	129	133	137	142	147	153	158	163	169	175	181
Other Gaseous Fuels 7/.....	5	6	6	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	12	12	13	13	13
Renewable Sources 4/.....	30	31	32	34	35	36	37	38	39	40	41	43	44	45	46	47	48	49	50	51	52	52	53	54
Other 8/.....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total.....	157	158	162	172	178	183	188	195	202	208	215	220	226	231	237	243	250	257	264	271	277	284	291	299
Other End-Use Generators 9/...	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7
Generation for Own Use.....	-134	-134	-136	-144	-147	-149	-152	-155	-158	-161	-164	-167	-170	-173	-176	-179	-182	-186	-190	-193	-197	-201	-206	-210
Total Sales to the Grid.....	27	28	31	32	35	38	41	45	48	52	55	58	61	63	66	69	73	76	80	83	86	88	92	95
Total Electricity Generation....	3831	3900	4003	4100	4191	4276	4359	4428	4510	4593	4678	4755	4830	4904	4987	5071	5159	5247	5335	5415	5503	5595	5693	5787
Net Imports.....	22	40	30	32	29	28	28	29	31	32	31	31	30	32	30	27	24	20	21	17	13	11	9	8

**AEO2004 Reference Case**

Table C1. Electricity Supply, Disposition, Prices, and Emissions (Continued)  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Electricity Sales by Sector</b>																								
Residential.....	1268	1282	1302	1319	1338	1360	1386	1405	1428	1450	1474	1490	1510	1531	1554	1571	1592	1615	1641	1657	1678	1701	1729	1747
Commercial.....	1208	1213	1254	1296	1335	1372	1408	1443	1480	1517	1552	1587	1621	1653	1684	1718	1754	1792	1828	1862	1895	1929	1965	2003
Industrial.....	994	978	1003	1030	1053	1073	1089	1103	1120	1140	1159	1180	1197	1216	1235	1256	1276	1292	1310	1327	1348	1372	1395	1422
Transportation.....	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35
Total.....	3492	3495	3582	3669	3750	3830	3909	3977	4055	4133	4212	4285	4357	4429	4502	4576	4653	4730	4811	4879	4955	5036	5123	5207
<b>End-Use Prices 10/ (2002 cents per kilowatthour)</b>																								
Residential.....	8.4	8.5	8.3	8.2	8.1	8.0	8.0	8.0	7.9	7.9	8.0	8.0	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Commercial.....	7.8	7.6	7.4	7.2	7.0	6.9	6.9	7.0	7.0	7.0	7.1	7.0	7.1	7.2	7.2	7.2	7.2	7.2	7.2	7.3	7.3	7.2	7.3	7.3
Industrial.....	5.0	4.8	4.7	4.6	4.6	4.5	4.6	4.6	4.6	4.5	4.6	4.6	4.6	4.7	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.7	4.8	4.8
Transportation.....	7.2	7.3	7.1	6.9	6.7	6.6	6.6	6.7	6.7	6.7	6.8	6.8	6.9	6.9	6.9	6.9	6.9	6.8	6.8	6.9	6.8	6.8	6.8	6.8
All Sectors Average.....	7.2	7.1	7.0	6.8	6.7	6.6	6.6	6.7	6.6	6.6	6.7	6.7	6.8	6.8	6.9	6.8	6.9	6.8	6.9	6.9	6.9	6.8	6.9	6.9
<b>Prices by Service Category 10/ (2002 cents per kilowatthour)</b>																								
Generation.....	4.6	4.6	4.4	4.3	4.2	4.2	4.1	4.2	4.1	4.1	4.2	4.2	4.3	4.4	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5
Transmission.....	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution.....	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
<b>Emissions</b>																								
Sulfur Dioxide (million tons).....	10.54	10.62	10.80	10.18	9.90	10.13	10.30	9.93	9.90	9.86	9.37	9.15	9.09	8.95	8.95	8.95	8.94	8.95	8.94	8.94	8.94	8.94	8.95	8.95
Nitrogen Oxide (million tons).....	4.39	3.70	3.23	3.28	3.36	3.43	3.46	3.48	3.50	3.52	3.54	3.56	3.57	3.60	3.63	3.65	3.64	3.65	3.67	3.66	3.68	3.71	3.73	3.75
Mercury (tons).....	50.95	50.87	49.95	50.12	50.78	52.14	52.26	52.33	52.20	52.81	52.84	52.45	52.45	52.65	53.24	53.19	53.02	53.17	53.59	53.74	53.72	53.87	53.97	54.37

1/ Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
2/ Includes plants that only produce electricity.  
3/ Includes electricity generation from fuel cells.  
4/ Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.  
5/ Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).  
6/ Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.  
7/ Other gaseous fuels include refinery and still gas.  
8/ Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
9/ Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.  
10/ Prices represent average revenue per kilowatthour.  
Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.  
Sources: 2001 and 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) and supporting databases. 2001 and 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, Transportation Energy Data Book 21 (Oak Ridge, TN, November 2001). 2001 and 2002 prices: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e. Projections: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e.

**AEO2004 Reference Case**

**Table C2. Natural Gas Supply and Disposition  
(Trillion Cubic Feet per Year)**

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Production</b>																								
Dry Gas Production 1/.....	19.05	19.57	19.51	19.58	19.66	19.95	20.21	20.25	20.50	20.80	21.11	21.30	21.43	21.62	21.58	21.99	22.82	23.54	23.79	23.55	23.37	23.51	23.88	23.99
Supplemental Natural Gas 2/..	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports.....</b>																								
Canada.....	3.49	3.51	3.60	3.87	4.28	4.43	4.78	5.04	5.50	5.76	5.90	6.05	6.20	6.24	6.76	6.79	6.64	6.43	6.47	6.69	6.99	7.02	7.12	7.24
Mexico.....	3.59	3.40	3.50	3.46	3.42	3.44	3.51	3.60	3.68	3.62	3.60	3.47	3.25	3.17	2.98	2.83	2.71	2.50	2.51	2.53	2.47	2.46	2.51	2.56
Liquefied Natural Gas.....	-0.26	-0.31	-0.42	-0.43	-0.45	-0.41	-0.37	-0.33	-0.34	-0.34	-0.28	-0.21	-0.14	-0.15	-0.16	-0.16	-0.17	-0.18	-0.18	-0.17	-0.16	-0.15	-0.14	-0.12
Total Supply.....	22.62	23.15	23.19	23.54	24.04	24.48	25.09	25.39	26.09	26.65	27.11	27.44	27.73	27.95	28.44	28.88	29.56	30.06	30.36	30.33	30.46	30.63	31.10	31.33
<b>Consumption by Sector</b>																								
Residential.....	4.92	5.07	5.18	5.21	5.29	5.35	5.42	5.47	5.53	5.58	5.62	5.63	5.65	5.68	5.73	5.75	5.80	5.85	5.92	5.93	5.96	6.01	6.06	6.09
Commercial.....	3.12	3.17	3.11	3.17	3.25	3.31	3.35	3.41	3.48	3.52	3.55	3.58	3.60	3.62	3.65	3.69	3.73	3.78	3.83	3.86	3.90	3.94	3.99	4.04
Industrial 3/.....	7.23	7.21	7.55	7.72	7.83	7.95	8.05	8.19	8.39	8.56	8.65	8.75	8.81	8.87	8.99	9.14	9.30	9.44	9.57	9.65	9.79	9.96	10.12	10.29
Electric Generators 4/.....	5.55	4.97	5.67	5.70	5.87	6.02	6.36	6.36	6.66	6.92	7.19	7.38	7.54	7.64	7.92	8.12	8.43	8.59	8.61	8.46	8.39	8.27	8.43	8.39
Transportation 5/.....	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11
Pipeline Fuel.....	0.63	0.66	0.65	0.65	0.65	0.65	0.65	0.66	0.67	0.68	0.69	0.70	0.70	0.70	0.70	0.71	0.75	0.80	0.81	0.81	0.80	0.81	0.83	0.84
Lease and Plant Fuel 6/.....	1.32	1.00	0.99	1.06	1.11	1.18	1.24	1.30	1.36	1.38	1.40	1.42	1.43	1.44	1.44	1.47	1.53	1.59	1.61	1.60	1.60	1.61	1.64	1.65
Total.....	22.78	22.09	23.17	23.53	24.04	24.50	25.12	25.43	26.15	26.71	27.18	27.51	27.80	28.03	28.51	28.96	29.63	30.14	30.44	30.41	30.54	30.71	31.18	31.41
Gas to Liquids.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discrepancy 7/.....	-0.16	1.06	0.02	0.01	-0.01	-0.02	-0.04	-0.05	-0.06	-0.06	-0.07	-0.07	-0.07	-0.07	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09

1/ Marketed production (wet) minus extraction losses.

2/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

3/ Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

4/ Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

5/ Compressed natural gas used as vehicle fuel.

6/ Represents natural gas used in the field gathering and processing plant machinery.

7/ Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2001 and 2002 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 supply values: Energy Information Administration (EIA), Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 supply values: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2001 and 2002 consumption based on: EIA, Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) Projections: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e.

**AEO2004 Reference Case**

Table C3. Oil and Gas Supply

Production and Supply	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Crude Oil</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per barrel).....	24.54	27.29	24.36	22.75	22.89	23.13	23.28	23.47	23.61	24.11	23.98	24.18	24.41	24.56	24.78	24.97	25.43	25.39	25.82	25.78	26.28	26.54	26.50	26.72
<b>Production (mmbbls per day) 2/</b>																								
United States Total.....	5.62	5.69	5.80	5.86	5.93	6.09	6.11	6.05	5.93	5.82	5.71	5.66	5.56	5.53	5.42	5.27	5.26	5.14	4.95	4.84	4.73	4.76	4.75	4.61
Lower 48 Onshore.....	3.11	2.93	2.95	2.90	2.83	2.77	2.72	2.66	2.61	2.56	2.51	2.47	2.42	2.38	2.34	2.30	2.27	2.23	2.20	2.17	2.13	2.11	2.08	2.04
Lower 48 Offshore.....	1.53	1.78	1.90	2.06	2.22	2.40	2.46	2.45	2.40	2.34	2.28	2.26	2.19	2.21	2.17	2.10	2.17	2.14	2.03	2.00	1.96	2.07	2.13	2.06
Alaska.....	0.98	0.98	0.95	0.90	0.88	0.91	0.93	0.94	0.92	0.92	0.92	0.93	0.95	0.93	0.91	0.87	0.82	0.77	0.72	0.67	0.63	0.58	0.54	0.51
L48 EOY Oil Reserves (bbls) 2/..	19.05	19.23	18.96	18.59	18.61	18.89	18.86	18.66	18.36	18.05	17.72	17.52	17.20	17.13	16.87	16.55	16.62	16.46	16.20	15.84	15.50	15.51	15.36	14.98
<b>Natural Gas</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per tcf).....	2.95	4.90	3.88	3.54	3.48	3.53	3.64	3.47	3.40	3.56	3.75	3.93	4.01	4.19	4.22	4.23	4.17	4.13	4.28	4.45	4.42	4.42	4.42	4.40
<b>Dry Production (tcf) 3/</b>																								
United States Total.....	19.05	19.57	19.51	19.58	19.67	19.96	20.22	20.25	20.50	20.80	21.12	21.31	21.43	21.62	21.58	21.99	22.82	23.55	23.79	23.55	23.38	23.52	23.88	23.99
Lower 48 Onshore.....	13.76	13.82	13.92	13.99	14.10	14.28	14.54	14.54	14.48	14.79	15.20	15.43	15.66	16.11	16.18	16.42	16.28	16.10	16.41	16.53	16.42	16.32	16.22	16.26
Associated-Dissolved 4/.....	1.60	1.54	1.54	1.52	1.50	1.47	1.45	1.43	1.41	1.38	1.37	1.35	1.33	1.31	1.29	1.28	1.26	1.25	1.23	1.22	1.21	1.19	1.18	1.17
Non-Associated.....	12.16	12.29	12.37	12.47	12.61	12.80	13.09	13.11	13.08	13.40	13.84	14.09	14.33	14.81	14.89	15.15	15.02	14.85	15.18	15.31	15.22	15.13	15.04	15.09
Conventional.....	6.23	6.07	6.26	6.29	6.16	6.09	6.03	5.87	5.80	5.86	5.98	6.01	6.01	6.13	6.06	6.10	6.04	5.96	6.07	6.10	6.02	6.00	5.96	5.92
Unconventional.....	5.93	6.22	6.12	6.18	6.45	6.71	7.06	7.24	7.28	7.54	7.86	8.08	8.32	8.67	8.83	9.04	8.98	8.89	9.11	9.21	9.20	9.13	9.08	9.16
Lower 48 Offshore.....	4.86	5.23	5.06	5.03	4.99	5.10	5.09	5.12	5.41	5.40	5.30	5.25	5.14	4.87	4.76	4.92	5.07	5.17	5.09	4.72	4.64	4.69	4.97	5.03
Associated-Dissolved 4/.....	1.05	1.13	1.16	1.16	1.16	1.48	1.76	1.70	1.61	1.52	1.44	1.37	1.36	1.33	1.38	1.38	1.33	1.35	1.34	1.25	1.25	1.24	1.38	1.43
Non-Associated.....	3.81	4.10	3.90	3.88	3.83	3.62	3.33	3.43	3.80	3.88	3.86	3.88	3.78	3.54	3.38	3.53	3.74	3.82	3.75	3.47	3.39	3.45	3.59	3.60
Alaska.....	0.43	0.51	0.54	0.56	0.57	0.58	0.59	0.59	0.60	0.61	0.62	0.62	0.63	0.64	0.65	0.66	1.47	2.29	2.29	2.30	2.31	2.50	2.70	2.71
L48 EOY Dry Gas Reserves (tcf)..	180.0	182.5	187.4	191.1	194.1	195.4	197.7	199.9	201.2	202.2	203.1	204.2	204.0	203.7	203.7	204.3	204.2	203.5	201.0	199.5	197.6	196.5	195.6	193.5
Supplemental Gas Supplies (tcf)5/	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lower 48 Wells (thousands).....	24.47	28.27	27.67	26.60	25.83	25.68	26.11	25.07	24.78	25.31	25.78	26.11	26.26	26.80	26.98	27.12	27.30	26.74	26.83	26.98	26.70	26.70	26.38	26.00

1/ Represents lower 48 onshore and offshore supplies.

2/ Includes lease condensate.

3/ Marketed production (wet) minus extraction losses.

4/ Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

5/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

tcf = trillion cubic feet

L48 = Lower 48 States



EOY = End-of-year

bbls = billion barrels

mmbbls = million barrels

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 and 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), Petroleum Supply Annual 2002, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2001 U.S. crude oil and natural gas reserves: EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, DOE/EIA-0216(2001) (Washington, DC, November 2002). 2001 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2001 and 2002 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e.

No Alaska Pipeline Case

Table C4. Electricity Supply, Disposition, Prices, and Emissions  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Generation by Fuel Type</b>																								
<b>Electric Power Sector 1/ Power Only 2/</b>																								
Coal.....	1875	1944	1947	2003	2058	2110	2131	2170	2195	2210	2234	2257	2280	2312	2347	2388	2432	2489	2557	2634	2731	2825	2904	2999
Petroleum.....	77	95	51	62	61	64	71	68	62	69	83	90	97	103	102	100	100	106	105	115	114	98	90	83
Natural Gas 3/.....	450	420	505	506	524	538	576	599	643	687	721	755	792	816	857	893	924	932	939	925	910	915	929	926
Nuclear Power.....	780	762	779	791	794	795	796	791	794	800	803	806	809	812	814	816	816	816	816	816	816	816	816	816
Pumped Storage/Other.....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources 4/.....	304	339	374	379	383	389	393	396	406	410	413	417	420	424	427	429	431	436	440	443	447	452	458	464
Distributed Gen (Natural Gas)	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	3	3	4	4	4	4	5
Non-Utility Gen for Own Use..	-34	-39	-40	-40	-40	-40	-40	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
Total.....	3443	3511	3607	3691	3770	3846	3918	3976	4054	4129	4207	4279	4352	4421	4501	4581	4658	4736	4814	4890	4975	5065	5155	5247
<b>Combined Heat and Power 5/</b>																								
Coal.....	32	28	29	30	32	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	33	33	33
Petroleum.....	6	2	0	0	0	1	1	1	1	2	2	3	4	5	4	4	4	4	4	4	4	3	3	3
Natural Gas.....	148	152	157	159	161	165	170	176	173	174	174	173	169	166	165	163	164	162	159	155	153	151	151	148
Renewable Sources.....	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Non-Utility Gen for Own Use..	-11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
Total.....	183	163	166	169	174	179	185	191	187	189	190	190	186	184	182	180	181	179	176	173	171	167	167	164
Net Available to the Grid.....	3626	3675	3773	3860	3944	4025	4102	4167	4241	4317	4397	4469	4538	4606	4683	4761	4840	4915	4990	5063	5146	5232	5322	5410
<b>End-Use Sector Generation</b>																								
<b>Combined Heat and Power 6/</b>																								
Coal.....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum.....	5	5	5	8	9	10	10	11	12	13	13	14	15	15	15	15	16	17	18	18	18	18	18	18
Natural Gas.....	84	84	86	89	94	97	100	105	109	114	118	121	125	128	133	137	142	147	152	156	161	166	172	179
Other Gaseous Fuels 7/.....	5	6	6	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	12	12	13	13	13
Renewable Sources 4/.....	30	31	32	34	35	36	37	38	39	40	41	43	44	45	46	47	48	49	50	51	51	52	53	54
Other 8/.....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total.....	157	158	162	172	178	183	188	195	202	208	215	220	226	231	237	243	250	256	263	269	275	282	289	296
Other End-Use Generators 9/...	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7
Generation for Own Use.....	-134	-134	-136	-144	-147	-149	-152	-155	-158	-161	-164	-167	-170	-173	-176	-179	-182	-186	-189	-193	-196	-200	-204	-209
Total Sales to the Grid.....	27	28	31	32	35	38	41	45	48	52	55	58	61	64	66	69	73	76	80	82	85	88	91	94
Total Electricity Generation....	3831	3900	4003	4100	4191	4276	4359	4428	4510	4592	4678	4756	4830	4903	4987	5070	5156	5238	5321	5399	5489	5581	5679	5775
Net Imports.....	22	40	30	32	29	28	28	29	31	32	31	31	30	32	30	27	24	21	23	19	15	11	9	7

## No Alaska Pipeline Case

Table C4. Electricity Supply, Disposition, Prices, and Emissions (Continued)  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Electricity Sales by Sector</b>																								
Residential.....	1268	1282	1302	1319	1339	1360	1386	1405	1428	1449	1474	1490	1511	1531	1554	1571	1592	1613	1638	1653	1674	1697	1725	1744
Commercial.....	1208	1213	1254	1296	1335	1371	1408	1443	1480	1517	1551	1587	1621	1653	1683	1717	1753	1788	1823	1857	1890	1924	1959	1998
Industrial.....	994	978	1003	1030	1053	1073	1089	1103	1120	1140	1159	1180	1197	1216	1235	1257	1275	1290	1306	1324	1346	1369	1391	1418
Transportation.....	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35
Total.....	3492	3495	3582	3669	3751	3830	3909	3977	4054	4132	4212	4285	4357	4428	4502	4575	4650	4722	4799	4866	4944	5024	5110	5195
<b>End-Use Prices 10/ (2002 cents per kilowatthour)</b>																								
Residential.....	8.4	8.5	8.3	8.2	8.1	8.0	8.0	8.0	8.0	7.9	8.0	8.0	8.1	8.1	8.1	8.1	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Commercial.....	7.8	7.6	7.4	7.2	7.0	6.9	6.9	7.0	7.0	7.0	7.1	7.0	7.1	7.2	7.2	7.2	7.3	7.3	7.4	7.4	7.4	7.4	7.4	7.4
Industrial.....	5.0	4.8	4.7	4.6	4.6	4.5	4.6	4.6	4.6	4.5	4.6	4.6	4.6	4.7	4.8	4.8	4.8	4.8	4.9	4.9	4.9	4.8	4.9	4.8
Transportation.....	7.2	7.3	7.1	6.9	6.7	6.6	6.6	6.7	6.7	6.7	6.8	6.8	6.9	6.9	6.9	6.9	6.9	7.0	6.9	6.9	6.9	6.9	6.9	6.8
All Sectors Average.....	7.2	7.1	7.0	6.8	6.7	6.6	6.6	6.7	6.6	6.6	6.7	6.7	6.8	6.8	6.9	6.9	6.9	7.0	7.0	7.0	7.0	6.9	7.0	6.9
<b>Prices by Service Category 10/ (2002 cents per kilowatthour)</b>																								
Generation.....	4.6	4.6	4.4	4.3	4.2	4.2	4.2	4.2	4.1	4.2	4.2	4.2	4.3	4.4	4.4	4.4	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.6
Transmission.....	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution.....	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
<b>Emissions</b>																								
Sulfur Dioxide (million tons).....	10.55	10.62	10.81	10.19	9.91	10.11	10.29	9.96	9.67	9.64	9.63	9.30	9.13	8.95	8.95	8.95	8.94	8.95	8.95	8.93	8.96	8.94	8.95	8.94
Nitrogen Oxide (million tons).....	4.39	3.70	3.23	3.28	3.35	3.43	3.46	3.48	3.50	3.51	3.54	3.56	3.57	3.60	3.62	3.65	3.65	3.66	3.67	3.67	3.69	3.71	3.73	3.75
Mercury (tons).....	50.88	51.01	50.12	50.24	50.86	52.06	52.57	52.69	52.11	52.59	52.83	52.16	52.15	52.35	52.71	52.92	52.84	52.97	53.34	53.63	53.69	54.04	54.20	54.48

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- 1/ Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.
  - 2/ Includes plants that only produce electricity.
  - 3/ Includes electricity generation from fuel cells.
  - 4/ Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.
  - 5/ Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).
  - 6/ Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.
  - 7/ Other gaseous fuels include refinery and still gas.
  - 8/ Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.
  - 9/ Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.
  - 10/ Prices represent average revenue per kilowatthour.
- Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.
- Sources: 2001 and 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) and supporting databases. 2001 and 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, Transportation Energy Data Book 21 (Oak Ridge, TN, November 2001). 2001 and 2002 prices: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e. Projections: EIA, AEO2004 National Energy Modeling System run noak.d012604b.

## No Alaska Pipeline Case

Table C5. Natural Gas Supply and Disposition  
(Trillion Cubic Feet per Year)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Production</b>																								
Dry Gas Production 1/.....	19.05	19.57	19.51	19.58	19.66	19.95	20.21	20.26	20.47	20.79	21.08	21.27	21.45	21.64	21.59	22.01	22.49	22.68	22.46	22.36	22.19	22.26	22.64	22.66
Supplemental Natural Gas 2/..	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports.....</b>																								
Canada.....	3.49	3.51	3.60	3.87	4.28	4.43	4.78	5.04	5.51	5.79	5.93	6.07	6.19	6.24	6.76	6.82	6.79	6.79	7.19	7.23	7.46	7.65	7.70	7.87
Mexico.....	3.59	3.40	3.50	3.46	3.42	3.44	3.51	3.60	3.68	3.65	3.62	3.48	3.23	3.16	2.98	2.85	2.80	2.69	2.65	2.64	2.60	2.63	2.68	2.75
Liquefied Natural Gas.....	-0.26	-0.31	-0.42	-0.43	-0.45	-0.41	-0.37	-0.33	-0.34	-0.34	-0.28	-0.21	-0.14	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.14	-0.13	-0.11	-0.09	0.00
Total Supply.....	0.17	0.43	0.52	0.84	1.31	1.40	1.64	1.77	2.16	2.48	2.59	2.80	3.11	3.22	3.94	4.13	4.16	4.27	4.70	4.73	4.98	5.13	5.11	5.12
<b>Consumption by Sector</b>																								
Residential.....	22.62	23.15	23.19	23.54	24.03	24.48	25.09	25.40	26.07	26.67	27.10	27.44	27.74	27.97	28.45	28.92	29.38	29.57	29.74	29.69	29.74	30.01	30.43	30.62
Commercial.....	4.92	5.07	5.18	5.21	5.29	5.35	5.42	5.47	5.53	5.58	5.62	5.62	5.65	5.68	5.73	5.75	5.79	5.82	5.86	5.88	5.91	5.96	6.03	6.06
Industrial 3/.....	3.12	3.17	3.11	3.17	3.25	3.31	3.35	3.41	3.48	3.52	3.55	3.57	3.60	3.62	3.65	3.69	3.72	3.76	3.79	3.82	3.85	3.90	3.96	4.01
Electric Generators 4/.....	7.23	7.21	7.55	7.72	7.83	7.96	8.05	8.19	8.38	8.56	8.65	8.74	8.80	8.87	8.99	9.14	9.27	9.37	9.47	9.56	9.69	9.85	10.02	10.18
Transportation 5/.....	5.55	4.97	5.67	5.70	5.87	6.02	6.36	6.37	6.65	6.95	7.19	7.39	7.56	7.66	7.93	8.16	8.37	8.38	8.38	8.19	8.06	8.06	8.14	8.08
Pipeline Fuel.....	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11
Lease and Plant Fuel 6/.....	0.63	0.66	0.65	0.65	0.65	0.65	0.65	0.66	0.67	0.68	0.69	0.70	0.70	0.70	0.70	0.71	0.72	0.73	0.72	0.72	0.71	0.72	0.73	0.73
Total.....	1.32	1.00	0.99	1.06	1.11	1.18	1.24	1.30	1.36	1.38	1.40	1.41	1.43	1.44	1.44	1.47	1.49	1.51	1.50	1.50	1.50	1.51	1.53	1.53
Gas to Liquids.....	22.78	22.09	23.18	23.53	24.04	24.50	25.12	25.44	26.14	26.73	27.17	27.51	27.81	28.04	28.53	29.00	29.45	29.65	29.82	29.77	29.83	30.09	30.52	30.71
Discrepancy 7/.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Discrepancy 7/.....</b>																								
	-0.16	1.06	0.02	0.01	-0.01	-0.02	-0.04	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09

1/ Marketed production (wet) minus extraction losses.

2/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

3/ Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

4/ Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

5/ Compressed natural gas used as vehicle fuel.

6/ Represents natural gas used in the field gathering and processing plant machinery.

7/ Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2001 and 2002 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 supply values: Energy Information Administration (EIA), Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 supply values: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2001 and 2002 consumption based on: EIA, Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) Projections: EIA, AEO2004 National Energy Modeling System run noak.d012604b.

## No Alaska Pipeline Case

Table C6. Oil and Gas Supply

Production and Supply	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Crude Oil</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per barrel).....	24.54	27.29	24.36	22.75	22.89	23.13	23.28	23.47	23.61	24.10	23.98	24.18	24.41	24.56	24.78	24.97	25.39	25.39	25.57	26.06	26.00	26.29	26.51	26.76
<b>Production (mmbbls per day) 2/</b>																								
United States Total.....	5.62	5.69	5.80	5.86	5.93	6.09	6.11	6.05	5.93	5.82	5.71	5.66	5.56	5.53	5.42	5.27	5.27	5.15	4.96	4.84	4.72	4.75	4.74	4.65
Lower 48 Onshore.....	3.11	2.93	2.95	2.90	2.83	2.77	2.72	2.66	2.61	2.56	2.51	2.47	2.42	2.38	2.34	2.30	2.27	2.23	2.20	2.17	2.14	2.10	2.07	2.04
Lower 48 Offshore.....	1.53	1.78	1.90	2.06	2.22	2.40	2.46	2.45	2.40	2.34	2.28	2.26	2.19	2.21	2.17	2.10	2.18	2.15	2.04	2.00	1.96	2.07	2.13	2.10
Alaska.....	0.98	0.98	0.95	0.90	0.88	0.91	0.93	0.94	0.92	0.92	0.92	0.93	0.95	0.93	0.91	0.87	0.82	0.77	0.72	0.67	0.63	0.58	0.54	0.51
L48 EOY Oil Reserves (bbls) 2/..	19.05	19.23	18.96	18.59	18.61	18.89	18.86	18.66	18.36	18.05	17.72	17.52	17.20	17.13	16.87	16.55	16.63	16.48	16.19	15.86	15.50	15.49	15.35	15.07
<b>Natural Gas</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per tcf).....	2.95	4.90	3.88	3.54	3.48	3.53	3.64	3.47	3.40	3.58	3.78	3.94	4.03	4.20	4.23	4.23	4.30	4.43	4.52	4.70	4.65	4.63	4.56	4.60
<b>Dry Production (tcf) 3/</b>																								
United States Total.....	19.05	19.57	19.51	19.58	19.66	19.96	20.21	20.26	20.48	20.79	21.08	21.27	21.46	21.64	21.60	22.01	22.50	22.69	22.46	22.37	22.20	22.26	22.64	22.66
Lower 48 Onshore.....	13.76	13.83	13.92	13.99	14.10	14.28	14.54	14.54	14.46	14.77	15.16	15.40	15.68	16.13	16.19	16.44	16.71	16.75	16.74	16.90	16.81	16.87	16.94	16.84
Associated-Dissolved 4/.....	1.60	1.54	1.54	1.52	1.50	1.47	1.45	1.43	1.41	1.38	1.37	1.35	1.33	1.31	1.29	1.28	1.26	1.25	1.23	1.22	1.21	1.19	1.18	1.17
Non-Associated.....	12.16	12.29	12.38	12.47	12.61	12.80	13.09	13.11	13.05	13.39	13.80	14.06	14.35	14.82	14.90	15.16	15.45	15.51	15.51	15.68	15.60	15.68	15.76	15.67
Conventional.....	6.23	6.07	6.26	6.29	6.16	6.09	6.03	5.87	5.80	5.87	5.99	6.02	6.02	6.14	6.06	6.11	6.16	6.14	6.14	6.25	6.16	6.16	6.12	6.07
Unconventional.....	5.93	6.22	6.12	6.18	6.45	6.71	7.06	7.24	7.25	7.52	7.80	8.04	8.33	8.68	8.84	9.05	9.29	9.37	9.37	9.43	9.45	9.52	9.64	9.61
Lower 48 Offshore.....	4.86	5.23	5.06	5.03	4.99	5.10	5.09	5.13	5.42	5.41	5.30	5.25	5.14	4.87	4.76	4.92	5.12	5.26	5.04	4.78	4.69	4.70	4.99	5.11
Associated-Dissolved 4/.....	1.05	1.13	1.16	1.16	1.16	1.48	1.76	1.70	1.61	1.52	1.44	1.37	1.36	1.33	1.38	1.38	1.33	1.35	1.34	1.26	1.25	1.24	1.37	1.43
Non-Associated.....	3.81	4.10	3.90	3.88	3.83	3.62	3.33	3.43	3.81	3.89	3.86	3.88	3.79	3.54	3.38	3.53	3.79	3.91	3.71	3.53	3.44	3.46	3.62	3.68
Alaska.....	0.43	0.51	0.54	0.56	0.57	0.58	0.59	0.59	0.60	0.61	0.62	0.62	0.63	0.64	0.65	0.66	0.66	0.67	0.68	0.68	0.69	0.70	0.71	0.71
L48 EOY Dry Gas Reserves (tcf)..	180.0	182.5	187.4	191.1	194.1	195.3	197.7	199.9	201.0	201.8	202.7	204.0	203.8	203.6	203.6	204.2	203.9	203.0	200.6	199.2	197.5	196.9	195.5	193.4
Supplemental Gas Supplies (tcf)5/	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lower 48 Wells (thousands).....	24.47	28.28	27.67	26.60	25.83	25.66	26.11	25.07	24.67	25.26	25.84	26.17	26.34	26.83	27.02	27.31	27.58	27.50	27.26	27.49	27.14	27.17	26.62	26.73

1/ Represents lower 48 onshore and offshore supplies.

2/ Includes lease condensate.

3/ Marketed production (wet) minus extraction losses.

4/ Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

5/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

tcf = trillion cubic feet

L48 = Lower 48 States

EOY = End-of-year

bbls = billion barrels

mmbbls = million barrels

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 and 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), Petroleum Supply Annual 2002, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2001 U.S. crude oil and natural gas reserves: EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, DOE/EIA-0216(2001) (Washington, DC, November 2002). 2001 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2001 and 2002 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2004 National Energy Modeling System run noak.d012604b.

Low LNG Import Case

Table C7. Electricity Supply, Disposition, Prices, and Emissions  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Generation by Fuel Type</b>																								
<b>Electric Power Sector 1/ Power Only 2/</b>																								
Coal.....	1875	1944	1947	2002	2057	2110	2132	2172	2200	2222	2245	2261	2283	2314	2350	2392	2440	2505	2584	2671	2778	2908	2990	3073
Petroleum.....	77	94	51	61	61	64	71	68	66	75	91	102	119	138	184	159	129	125	124	139	132	117	113	112
Natural Gas 3/.....	450	420	504	505	524	537	577	595	637	671	702	740	761	769	751	804	863	877	871	835	819	798	809	813
Nuclear Power.....	780	762	779	791	794	795	796	791	794	800	803	806	809	812	814	816	816	816	816	816	816	816	816	816
Pumped Storage/Other.....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources 4/.....	304	339	374	379	383	389	393	396	400	405	408	413	417	422	425	432	439	449	459	475	479	482	486	493
Distributed Gen (Natural Gas)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3	3	4	4	4	5
Non-Utility Gen for Own Use..	-34	-39	-40	-40	-40	-40	-40	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
Total.....	3443	3511	3607	3689	3770	3845	3918	3976	4052	4127	4203	4275	4343	4409	4480	4558	4642	4728	4811	4894	4981	5079	5173	5266
<b>Combined Heat and Power 5/</b>																								
Coal.....	32	28	29	30	32	33	33	33	33	33	33	33	34	34	33	34	33	33	33	34	33	33	33	33
Petroleum.....	6	2	0	0	0	1	1	1	1	2	3	4	6	7	10	7	5	5	5	6	5	5	4	4
Natural Gas.....	148	152	157	160	161	165	170	176	174	173	174	172	168	164	159	157	161	159	159	152	148	143	144	141
Renewable Sources.....	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Non-Utility Gen for Own Use..	-11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
Total.....	183	163	166	170	174	179	184	191	189	189	190	189	187	184	183	178	179	177	177	171	167	160	161	159
Net Available to the Grid.....	3626	3674	3773	3860	3944	4025	4102	4167	4240	4316	4393	4464	4530	4592	4662	4736	4821	4905	4988	5065	5148	5240	5334	5424
<b>End-Use Sector Generation</b>																								
<b>Combined Heat and Power 6/</b>																								
Coal.....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum.....	5	5	5	8	9	10	10	11	12	13	14	15	15	16	17	18	18	18	18	18	18	18	18	18
Natural Gas.....	84	84	86	89	94	97	100	105	109	113	117	121	124	127	131	135	139	144	148	153	157	161	166	171
Other Gaseous Fuels 7/.....	5	6	6	8	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	12	13	13
Renewable Sources 4/.....	30	31	32	34	35	36	37	37	39	40	41	43	44	45	46	47	48	49	50	51	51	52	53	54
Other 8/.....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total.....	157	158	162	172	178	183	188	195	202	208	215	221	226	232	237	243	249	254	260	266	271	276	282	288
Other End-Use Generators 9/...	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7
Generation for Own Use.....	-134	-134	-136	-144	-147	-149	-152	-155	-158	-161	-164	-167	-170	-172	-175	-178	-181	-184	-188	-191	-194	-198	-201	-205
Total Sales to the Grid.....	27	28	31	32	35	38	41	45	48	52	55	59	62	64	67	70	73	75	78	80	83	85	87	90
Total Electricity Generation....	3831	3900	4003	4100	4191	4276	4359	4428	4509	4590	4674	4751	4823	4891	4966	5046	5136	5226	5315	5398	5486	5584	5683	5780
Net Imports.....	22	40	30	32	29	28	28	29	31	32	31	31	30	33	33	30	26	21	21	17	14	10	8	7

Low LNG Import Case

Table C7. Electricity Supply, Disposition, Prices, and Emissions (Continued)  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Electricity Sales by Sector</b>																								
Residential.....	1268	1282	1302	1319	1338	1360	1386	1405	1427	1448	1472	1488	1508	1527	1549	1565	1586	1609	1635	1651	1673	1697	1725	1744
Commercial.....	1208	1213	1254	1296	1335	1372	1408	1443	1480	1516	1550	1585	1618	1648	1677	1710	1746	1783	1819	1854	1888	1923	1960	1999
Industrial.....	994	978	1003	1030	1053	1073	1089	1103	1120	1140	1158	1179	1197	1214	1230	1251	1273	1289	1308	1326	1348	1374	1398	1426
Transportation.....	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35
Total.....	3492	3495	3582	3669	3750	3830	3909	3977	4054	4131	4208	4281	4351	4418	4486	4556	4635	4712	4794	4865	4942	5028	5117	5204
<b>End-Use Prices 10/ (2002 cents per kilowatthour)</b>																								
Residential.....	8.4	8.5	8.3	8.2	8.1	8.0	8.0	8.0	8.0	8.0	8.0	8.1	8.2	8.2	8.3	8.3	8.2	8.2	8.3	8.3	8.3	8.2	8.2	8.2
Commercial.....	7.8	7.6	7.4	7.2	7.0	6.9	6.9	7.0	7.0	7.0	7.1	7.1	7.2	7.3	7.4	7.4	7.4	7.4	7.5	7.4	7.4	7.3	7.4	7.4
Industrial.....	5.0	4.8	4.7	4.6	4.6	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8	4.8	4.8
Transportation.....	7.2	7.3	7.1	6.9	6.7	6.6	6.6	6.7	6.7	6.7	6.8	6.9	7.0	7.0	7.1	7.1	7.0	7.0	7.0	7.0	6.9	6.8	6.8	6.8
All Sectors Average.....	7.2	7.1	7.0	6.8	6.7	6.6	6.6	6.7	6.7	6.7	6.7	6.8	6.9	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.9	6.9	6.9
<b>Prices by Service Category 10/ (2002 cents per kilowatthour)</b>																								
Generation.....	4.6	4.6	4.4	4.3	4.2	4.2	4.1	4.2	4.2	4.2	4.3	4.3	4.4	4.5	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.6	4.6
Transmission.....	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution.....	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
<b>Emissions</b>																								
Sulfur Dioxide (million tons).....	10.55	10.62	10.80	10.16	9.96	10.15	10.29	9.92	9.63	9.54	9.66	9.32	9.14	8.99	8.96	8.96	8.95	8.95	8.94	8.96	8.95	8.93	8.95	8.96
Nitrogen Oxide (million tons).....	4.39	3.70	3.23	3.27	3.35	3.43	3.46	3.48	3.50	3.52	3.54	3.57	3.58	3.60	3.63	3.65	3.65	3.66	3.67	3.65	3.67	3.69	3.71	3.73
Mercury (tons).....	50.96	50.99	50.06	50.37	51.05	52.23	52.42	52.28	51.87	52.13	52.62	52.73	52.78	52.95	53.35	53.48	53.28	53.47	53.77	54.18	54.50	54.45	54.59	54.83

1/ Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
2/ Includes plants that only produce electricity.  
3/ Includes electricity generation from fuel cells.  
4/ Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.  
5/ Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).  
6/ Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.  
7/ Other gaseous fuels include refinery and still gas.  
8/ Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
9/ Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.  
10/ Prices represent average revenue per kilowatthour.  
Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.  
Sources: 2001 and 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) and supporting databases. 2001 and 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, Transportation Energy Data Book 21 (Oak Ridge, TN, November 2001). 2001 and 2002 prices: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e. Projections: EIA, AEO2004 National Energy Modeling System run lowlng.d020404a.



Low LNG Import Case

Table C8. Natural Gas Supply and Disposition  
(Trillion Cubic Feet per Year)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Production</b>																								
Dry Gas Production 1/.....	19.05	19.57	19.51	19.58	19.66	19.95	20.21	20.34	20.67	21.21	21.54	21.79	22.12	22.23	22.53	23.25	24.14	24.57	24.71	24.45	24.46	24.40	24.71	24.86
Supplemental Natural Gas 2/..	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports.....</b>																								
Canada.....	3.49	3.51	3.60	3.87	4.28	4.43	4.78	4.94	5.27	5.25	5.32	5.39	5.25	5.20	5.07	4.89	4.72	4.64	4.67	4.67	4.68	4.77	4.83	4.95
Mexico.....	3.59	3.40	3.50	3.46	3.42	3.44	3.51	3.61	3.70	3.66	3.65	3.53	3.30	3.25	3.12	2.94	2.77	2.68	2.70	2.68	2.67	2.73	2.76	2.84
Liquefied Natural Gas.....	-0.26	-0.31	-0.42	-0.43	-0.45	-0.41	-0.37	-0.33	-0.34	-0.34	-0.28	-0.20	-0.13	-0.13	-0.13	-0.12	-0.12	-0.12	-0.11	-0.09	-0.07	-0.04	-0.01	0.03
Total Supply.....	0.17	0.43	0.52	0.84	1.31	1.40	1.64	1.66	1.91	1.93	1.95	2.07	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08
<b>Consumption by Sector</b>																								
Residential.....	22.62	23.15	23.19	23.54	24.04	24.48	25.09	25.38	26.04	26.56	26.96	27.27	27.46	27.52	27.70	28.24	28.96	29.31	29.48	29.22	29.24	29.26	29.64	29.90
Commercial.....	4.92	5.07	5.18	5.21	5.29	5.35	5.42	5.47	5.53	5.57	5.61	5.60	5.62	5.63	5.66	5.68	5.74	5.79	5.85	5.86	5.89	5.93	6.00	6.02
Industrial 3/.....	3.12	3.17	3.11	3.17	3.25	3.31	3.35	3.41	3.47	3.51	3.54	3.55	3.57	3.58	3.59	3.62	3.67	3.72	3.77	3.80	3.83	3.87	3.92	3.97
Electric Generators 4/.....	7.23	7.21	7.55	7.72	7.84	7.95	8.05	8.19	8.37	8.54	8.62	8.71	8.76	8.81	8.89	9.03	9.19	9.31	9.41	9.48	9.61	9.76	9.92	10.07
Transportation 5/.....	5.55	4.97	5.67	5.70	5.87	6.02	6.36	6.34	6.62	6.84	7.06	7.26	7.34	7.31	7.32	7.58	7.91	7.99	7.92	7.56	7.38	7.17	7.25	7.25
Pipeline Fuel.....	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11	0.11
Lease and Plant Fuel 6/.....	0.63	0.66	0.65	0.65	0.65	0.65	0.65	0.66	0.68	0.70	0.71	0.71	0.72	0.72	0.73	0.77	0.82	0.84	0.85	0.85	0.85	0.85	0.86	0.87
Total.....	1.32	1.00	0.99	1.06	1.11	1.18	1.24	1.30	1.37	1.40	1.42	1.44	1.46	1.47	1.49	1.54	1.61	1.64	1.66	1.65	1.66	1.66	1.68	1.69
Gas to Liquids.....	22.78	22.09	23.17	23.53	24.04	24.50	25.12	25.43	26.10	26.62	27.03	27.34	27.53	27.60	27.75	28.30	29.04	29.39	29.56	29.30	29.32	29.35	29.72	29.98
Discrepancy 7/.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Discrepancy 7/.....</b>																								
	-0.16	1.06	0.02	0.01	-0.01	-0.02	-0.03	-0.05	-0.06	-0.07	-0.07	-0.07	-0.07	-0.07	-0.05	-0.07	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09

1/ Marketed production (wet) minus extraction losses.

2/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

3/ Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

4/ Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

5/ Compressed natural gas used as vehicle fuel.

6/ Represents natural gas used in the field gathering and processing plant machinery.

7/ Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2001 and 2002 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 supply values: Energy Information Administration (EIA), Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 supply values: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2001 and 2002 consumption based on: EIA, Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) Projections: EIA, AEO2004 National Energy Modeling System run lowlng.d020404a.

Low LNG Import Case

Table C9. Oil and Gas Supply

Production and Supply	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Crude Oil																								
L48 Average Wellhead Price 1/ (2002 dollars per barrel).....	24.54	27.29	24.36	22.75	22.89	23.13	23.28	23.48	23.62	24.09	23.97	24.20	24.41	24.60	24.75	25.04	25.43	25.44	25.81	25.79	26.28	26.30	26.51	26.79
Production (mmbbls per day) 2/																								
United States Total.....	5.62	5.69	5.80	5.86	5.93	6.09	6.11	6.05	5.93	5.82	5.71	5.66	5.57	5.54	5.42	5.28	5.28	5.15	4.97	4.85	4.73	4.75	4.78	4.69
Lower 48 Onshore.....	3.11	2.93	2.95	2.90	2.83	2.77	2.72	2.66	2.61	2.56	2.51	2.47	2.42	2.38	2.34	2.31	2.27	2.24	2.20	2.17	2.14	2.11	2.08	2.05
Lower 48 Offshore.....	1.53	1.78	1.90	2.06	2.22	2.40	2.46	2.45	2.40	2.34	2.28	2.26	2.19	2.22	2.17	2.10	2.19	2.15	2.04	2.00	1.96	2.06	2.16	2.13
Alaska.....	0.98	0.98	0.95	0.90	0.88	0.91	0.93	0.94	0.92	0.92	0.92	0.93	0.95	0.93	0.91	0.87	0.82	0.77	0.72	0.67	0.63	0.58	0.54	0.51
L48 EOY Oil Reserves (bbls) 2/..	19.05	19.23	18.96	18.59	18.61	18.89	18.86	18.66	18.36	18.06	17.72	17.52	17.22	17.16	16.89	16.58	16.67	16.52	16.24	15.88	15.53	15.50	15.46	15.18
Natural Gas																								
L48 Average Wellhead Price 1/ (2002 dollars per tcf).....	2.95	4.90	3.88	3.54	3.48	3.53	3.64	3.49	3.45	3.67	3.88	4.09	4.26	4.49	4.65	4.61	4.47	4.48	4.61	4.76	4.80	4.81	4.72	4.74
Dry Production (tcf) 3/																								
United States Total.....	19.05	19.57	19.51	19.58	19.67	19.96	20.21	20.35	20.68	21.21	21.55	21.79	22.12	22.23	22.54	23.25	24.15	24.58	24.71	24.45	24.46	24.40	24.71	24.86
Lower 48 Onshore.....	13.76	13.83	13.91	13.99	14.10	14.28	14.54	14.61	14.59	15.15	15.60	15.89	16.27	16.62	16.98	16.78	16.71	16.81	16.95	16.99	17.01	16.98	16.98	17.00
Associated-Dissolved 4/.....	1.60	1.54	1.54	1.52	1.50	1.47	1.45	1.43	1.41	1.38	1.37	1.35	1.33	1.31	1.29	1.28	1.26	1.25	1.23	1.22	1.21	1.19	1.18	1.17
Non-Associated.....	12.16	12.29	12.37	12.47	12.61	12.80	13.09	13.18	13.19	13.77	14.24	14.54	14.94	15.31	15.68	15.50	15.45	15.56	15.72	15.77	15.81	15.78	15.80	15.83
Conventional.....	6.23	6.07	6.26	6.29	6.16	6.09	6.03	5.90	5.85	6.02	6.09	6.14	6.24	6.31	6.38	6.32	6.29	6.29	6.35	6.36	6.36	6.32	6.26	6.21
Unconventional.....	5.93	6.22	6.12	6.18	6.45	6.71	7.06	7.27	7.33	7.75	8.15	8.40	8.71	8.99	9.30	9.18	9.16	9.27	9.36	9.40	9.45	9.46	9.53	9.63
Lower 48 Offshore.....	4.86	5.23	5.06	5.03	4.99	5.10	5.09	5.15	5.48	5.45	5.32	5.27	5.22	4.97	4.91	5.01	5.16	5.29	5.10	4.79	4.76	4.73	5.03	5.15
Associated-Dissolved 4/.....	1.05	1.13	1.16	1.16	1.16	1.48	1.76	1.70	1.61	1.52	1.44	1.37	1.36	1.33	1.38	1.38	1.34	1.35	1.34	1.26	1.26	1.24	1.37	1.44
Non-Associated.....	3.81	4.10	3.90	3.88	3.83	3.62	3.33	3.45	3.87	3.93	3.89	3.91	3.86	3.64	3.53	3.63	3.82	3.94	3.76	3.53	3.51	3.49	3.66	3.70
Alaska.....	0.43	0.51	0.54	0.56	0.57	0.58	0.59	0.59	0.60	0.61	0.62	0.62	0.63	0.64	0.65	1.46	2.28	2.47	2.67	2.68	2.68	2.69	2.70	2.71
L48 EOY Dry Gas Reserves (tcf)..	180.0	182.5	187.4	191.1	194.1	195.4	197.7	199.9	201.2	202.1	202.9	204.0	203.8	203.7	203.7	204.6	204.8	203.8	201.2	199.5	197.6	196.8	195.2	192.7
Supplemental Gas Supplies (tcf)5/	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lower 48 Wells (thousands).....	24.47	28.27	27.67	26.60	25.83	25.68	26.11	25.34	25.07	25.52	26.12	26.55	26.91	27.66	28.25	28.36	28.14	27.66	27.49	27.52	27.52	27.51	27.09	26.96

1/ Represents lower 48 onshore and offshore supplies.

2/ Includes lease condensate.

3/ Marketed production (wet) minus extraction losses.

4/ Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

5/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

tcf = trillion cubic feet

L48 = Lower 48 States

EOY = End-of-year

bbls = billion barrels

mmbbls = million barrels

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 and 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), Petroleum Supply Annual 2002, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2001 U.S. crude oil and natural gas reserves: EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, DOE/EIA-0216(2001) (Washington, DC, November 2002). 2001 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2001 and 2002 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2004 National Energy Modeling System run lowlng.d020404a.

## Low Unconventional Gas Recovery Case

Table C10. Electricity Supply, Disposition, Prices, and Emissions  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Generation by Fuel Type</b>																								
<b>Electric Power Sector 1/ Power Only 2/</b>																								
Coal.....	1875	1946	1946	2002	2059	2111	2127	2163	2189	2212	2234	2256	2280	2313	2348	2395	2445	2504	2581	2668	2761	2873	2969	3073
Petroleum.....	77	103	62	75	74	75	82	79	80	97	122	116	124	123	106	128	134	143	134	157	127	121	109	108
Natural Gas 3/.....	450	407	490	484	502	518	560	580	612	638	657	707	746	771	824	832	847	846	845	815	833	820	827	818
Nuclear Power.....	780	762	779	791	794	795	796	791	794	800	803	806	809	812	814	816	816	816	816	816	816	816	816	816
Pumped Storage/Other.....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources 4/.....	304	337	374	379	383	388	393	397	407	411	416	420	430	437	443	450	457	462	472	474	478	479	484	489
Distributed Gen (Natural Gas)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	2	3	3	3	4	4	4	5
Non-Utility Gen for Own Use..	-34	-39	-40	-40	-40	-40	-40	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
Total.....	3443	3508	3603	3682	3763	3838	3907	3963	4035	4112	4185	4259	4343	4411	4489	4576	4654	4727	4806	4887	4972	5066	5164	5263
<b>Combined Heat and Power 5/</b>																								
Coal.....	32	28	29	30	32	33	33	33	33	33	33	34	34	34	34	34	34	34	34	34	34	33	33	33
Petroleum.....	6	5	1	2	1	1	2	2	2	4	6	5	6	5	4	5	5	6	5	6	5	4	4	4
Natural Gas.....	148	153	157	157	158	162	168	173	174	171	170	170	165	168	166	158	156	154	155	150	151	147	147	142
Renewable Sources.....	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Non-Utility Gen for Own Use..	-11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
Total.....	183	166	167	169	171	177	183	189	189	188	189	189	185	187	183	176	175	173	174	169	169	165	164	159
Net Available to the Grid.....	3626	3673	3770	3851	3934	4015	4090	4152	4225	4300	4374	4447	4528	4597	4672	4752	4829	4900	4980	5057	5142	5231	5327	5422
<b>End-Use Sector Generation</b>																								
<b>Combined Heat and Power 6/</b>																								
Coal.....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum.....	5	5	5	8	9	10	10	11	12	13	14	14	15	15	15	15	16	17	18	18	18	18	18	18
Natural Gas.....	84	84	85	88	92	94	98	102	106	110	113	117	120	124	129	133	137	141	146	150	154	159	164	168
Other Gaseous Fuels 7/.....	5	6	6	8	8	8	9	9	9	10	10	10	10	11	11	11	12	12	12	12	12	12	13	13
Renewable Sources 4/.....	30	31	32	34	35	36	36	37	39	40	41	43	44	45	46	47	48	49	50	51	51	52	53	54
Other 8/.....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total.....	157	158	161	171	176	180	185	192	198	205	211	216	222	227	233	238	245	251	258	262	268	274	280	286
Other End-Use Generators 9/...	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7
Generation for Own Use.....	-134	-134	-136	-144	-147	-148	-150	-153	-157	-160	-162	-165	-168	-171	-174	-177	-180	-183	-186	-189	-193	-196	-200	-203
Total Sales to the Grid.....	27	28	30	31	34	37	39	43	47	50	53	56	59	61	64	67	70	73	77	79	81	84	87	89
Total Electricity Generation....	3831	3899	3999	4090	4179	4264	4344	4410	4490	4571	4650	4730	4816	4891	4972	5057	5140	5217	5304	5386	5476	5572	5674	5775
Net Imports.....	22	40	30	33	29	28	30	32	34	34	34	32	30	33	30	28	26	22	23	21	14	11	8	7

**Low Unconventional Gas Recovery Case**

Table C10. Electricity Supply, Disposition, Prices, and Emissions (Continued)  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Electricity Sales by Sector</b>																								
Residential.....	1268	1282	1301	1316	1335	1357	1383	1401	1423	1444	1467	1483	1505	1528	1551	1567	1587	1607	1633	1650	1672	1696	1725	1744
Commercial.....	1208	1213	1252	1293	1331	1366	1402	1436	1472	1508	1541	1576	1612	1645	1675	1711	1745	1780	1815	1850	1882	1918	1955	1995
Industrial.....	994	978	1002	1028	1050	1072	1088	1101	1118	1138	1155	1178	1198	1217	1235	1258	1276	1289	1306	1325	1347	1372	1396	1426
Transportation.....	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35
Total.....	3492	3495	3579	3661	3741	3820	3897	3964	4040	4115	4191	4264	4343	4419	4491	4566	4639	4708	4786	4858	4935	5019	5110	5201
<b>End-Use Prices 10/ (2002 cents per kilowatthour)</b>																								
Residential.....	8.4	8.5	8.4	8.3	8.2	8.1	8.1	8.1	8.1	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.3	8.3	8.3	8.3	8.3	8.2	8.2	8.2
Commercial.....	7.8	7.6	7.4	7.3	7.2	7.0	7.0	7.1	7.1	7.2	7.3	7.2	7.2	7.3	7.3	7.3	7.4	7.4	7.4	7.5	7.4	7.4	7.4	7.4
Industrial.....	5.0	4.8	4.7	4.7	4.6	4.6	4.6	4.7	4.7	4.7	4.8	4.7	4.7	4.8	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8
Transportation.....	7.2	7.3	7.1	7.0	6.8	6.7	6.7	6.8	6.8	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.9	6.9	6.9	6.8
All Sectors Average.....	7.2	7.2	7.0	6.9	6.8	6.7	6.7	6.8	6.8	6.8	6.9	6.9	6.9	6.9	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.9
<b>Prices by Service Category 10/ (2002 cents per kilowatthour)</b>																								
Generation.....	4.6	4.6	4.5	4.4	4.3	4.3	4.2	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.5	4.5	4.6	4.6	4.6	4.7	4.6	4.6	4.6	4.6
Transmission.....	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution.....	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
<b>Emissions</b>																								
Sulfur Dioxide (million tons).....	10.57	10.65	10.73	10.17	10.19	10.05	9.87	9.63	9.60	10.04	9.65	9.34	9.23	9.04	8.92	8.94	8.93	8.94	8.93	8.97	8.94	8.95	8.95	8.95
Nitrogen Oxide (million tons).....	4.39	3.71	3.22	3.28	3.36	3.43	3.46	3.48	3.50	3.52	3.54	3.56	3.58	3.60	3.62	3.63	3.63	3.64	3.65	3.65	3.67	3.69	3.71	3.72
Mercury (tons).....	51.07	51.02	49.90	50.27	51.29	52.19	51.75	52.09	51.99	53.37	53.45	52.67	52.86	52.93	53.11	53.19	53.19	53.56	53.94	54.37	54.38	54.86	54.75	54.83

1/ Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
2/ Includes plants that only produce electricity.  
3/ Includes electricity generation from fuel cells.  
4/ Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.  
5/ Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).  
6/ Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.  
7/ Other gaseous fuels include refinery and still gas.  
8/ Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
9/ Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.  
10/ Prices represent average revenue per kilowatthour.  
Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.  
Sources: 2001 and 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) and supporting databases. 2001 and 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, Transportation Energy Data Book 21 (Oak Ridge, TN, November 2001). 2001 and 2002 prices: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e. Projections: EIA, AEO2004 National Energy Modeling System run ug0tec03.d020404b.

## Low Unconventional Gas Recovery Case

Table C11. Natural Gas Supply and Disposition  
(Trillion Cubic Feet per Year)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Production</b>																								
Dry Gas Production 1/.....	19.05	19.43	19.07	18.72	18.66	18.78	18.78	18.80	19.23	19.37	19.50	19.85	20.36	20.72	20.99	21.05	21.11	21.22	21.26	21.01	20.84	20.66	20.84	20.81
Supplemental Natural Gas 2/..	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports.....</b>																								
Canada.....	3.49	3.54	3.79	4.25	4.79	5.14	5.75	5.98	6.15	6.42	6.53	6.62	6.73	6.74	6.89	7.12	7.30	7.31	7.46	7.68	8.08	8.36	8.52	8.67
Mexico.....	3.59	3.43	3.69	3.82	3.88	3.89	3.95	4.06	4.08	3.94	3.85	3.55	3.17	3.11	3.07	2.92	2.73	2.53	2.59	2.60	2.65	2.70	2.78	2.85
Liquefied Natural Gas.....	-0.26	-0.31	-0.42	-0.42	-0.43	-0.39	-0.34	-0.30	-0.29	-0.29	-0.21	-0.13	-0.05	-0.06	-0.05	-0.05	-0.04	-0.02	0.01	0.10	0.20	0.30	0.34	0.39
	0.17	0.43	0.52	0.86	1.35	1.63	2.14	2.22	2.36	2.76	2.89	3.20	3.62	3.68	3.88	4.25	4.61	4.80	4.87	4.98	5.24	5.36	5.40	5.43
<b>Total Supply.....</b>																								
	22.62	23.05	22.94	23.07	23.55	24.02	24.63	24.88	25.47	25.88	26.13	26.56	27.19	27.56	27.98	28.26	28.51	28.62	28.82	28.79	29.02	29.12	29.46	29.58
<b>Consumption by Sector</b>																								
Residential.....	4.92	5.07	5.14	5.15	5.22	5.29	5.36	5.40	5.46	5.50	5.53	5.54	5.59	5.64	5.70	5.71	5.73	5.76	5.81	5.83	5.88	5.93	5.99	6.02
Commercial.....	3.12	3.17	3.09	3.14	3.21	3.27	3.31	3.36	3.42	3.46	3.48	3.50	3.54	3.58	3.62	3.64	3.67	3.70	3.74	3.77	3.82	3.86	3.91	3.96
Industrial 3/.....	7.23	7.21	7.50	7.58	7.73	7.86	7.94	8.08	8.27	8.43	8.50	8.62	8.72	8.82	8.95	9.07	9.18	9.26	9.36	9.44	9.60	9.73	9.90	10.05
Electric Generators 4/.....	5.55	4.87	5.56	5.52	5.67	5.84	6.20	6.18	6.39	6.54	6.65	6.87	7.21	7.36	7.54	7.65	7.70	7.66	7.66	7.50	7.50	7.36	7.41	7.29
Transportation 5/.....	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11
Pipeline Fuel.....	0.63	0.66	0.63	0.62	0.61	0.61	0.61	0.62	0.63	0.64	0.64	0.67	0.71	0.72	0.72	0.72	0.73	0.73	0.74	0.73	0.72	0.72	0.73	0.73
Lease and Plant Fuel 6/.....	1.32	1.00	0.98	1.03	1.08	1.13	1.18	1.24	1.31	1.32	1.33	1.37	1.42	1.44	1.46	1.47	1.48	1.49	1.50	1.49	1.49	1.48	1.50	1.50
Total.....	22.78	21.99	22.93	23.06	23.55	24.04	24.66	24.93	25.53	25.95	26.19	26.64	27.25	27.63	28.08	28.34	28.58	28.70	28.89	28.86	29.11	29.20	29.54	29.66
Gas to Liquids.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Discrepancy 7/.....</b>																								
	-0.16	1.06	0.02	0.01	-0.01	-0.02	-0.03	-0.05	-0.06	-0.06	-0.07	-0.09	-0.07	-0.07	-0.10	-0.08	-0.08	-0.08	-0.08	-0.06	-0.08	-0.08	-0.08	-0.08

1/ Marketed production (wet) minus extraction losses.

2/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

3/ Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

4/ Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

5/ Compressed natural gas used as vehicle fuel.

6/ Represents natural gas used in the field gathering and processing plant machinery.

7/ Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2001 and 2002 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 supply values: Energy Information Administration (EIA), Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 supply values: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2001 and 2002 consumption based on: EIA, Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) Projections: EIA, AEO2004 National Energy Modeling System run ug0tec03.d020404b.

**Low Unconventional Gas Recovery Case**

Table C12. Oil and Gas Supply

Production and Supply	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Crude Oil</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per barrel).....	24.54	27.29	24.36	22.79	22.90	23.11	23.24	23.44	23.58	24.07	23.94	24.18	24.49	24.58	24.91	24.97	25.37	25.37	25.80	25.75	26.33	26.26	26.52	26.77
<b>Production (mmbbls per day) 2/</b>																								
United States Total.....	5.62	5.69	5.80	5.86	5.94	6.10	6.12	6.06	5.95	5.83	5.69	5.64	5.61	5.59	5.50	5.35	5.32	5.16	4.95	4.82	4.71	4.74	4.77	4.68
Lower 48 Onshore.....	3.11	2.93	2.95	2.91	2.83	2.78	2.72	2.67	2.61	2.56	2.52	2.47	2.43	2.39	2.35	2.31	2.27	2.24	2.21	2.18	2.14	2.11	2.08	2.05
Lower 48 Offshore.....	1.53	1.78	1.90	2.06	2.23	2.41	2.46	2.46	2.41	2.34	2.25	2.24	2.23	2.27	2.24	2.17	2.22	2.16	2.02	1.97	1.94	2.05	2.15	2.12
Alaska.....	0.98	0.98	0.95	0.90	0.88	0.91	0.93	0.94	0.92	0.92	0.92	0.93	0.95	0.93	0.91	0.87	0.82	0.77	0.72	0.67	0.63	0.58	0.54	0.51
L48 EOY Oil Reserves (bbls) 2/..	19.05	19.24	18.98	18.62	18.65	18.93	18.89	18.70	18.41	18.10	17.68	17.51	17.34	17.32	17.10	16.78	16.79	16.59	16.29	15.93	15.59	15.46	15.43	15.16
<b>Natural Gas</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per tcf).....	2.95	5.21	4.31	4.02	3.91	3.90	3.97	3.84	3.77	3.99	4.29	4.38	4.17	4.28	4.48	4.54	4.65	4.73	4.79	4.89	4.88	4.84	4.77	4.85
<b>Dry Production (tcf) 3/</b>																								
United States Total.....	19.05	19.43	19.08	18.72	18.66	18.79	18.79	18.80	19.23	19.37	19.50	19.85	20.36	20.72	20.99	21.05	21.11	21.22	21.26	21.02	20.85	20.67	20.84	20.81
Lower 48 Onshore.....	13.76	13.69	13.39	12.96	13.01	12.99	13.08	13.00	13.02	13.23	13.47	13.22	12.89	13.24	13.50	13.51	13.51	13.46	13.56	13.56	13.45	13.30	13.15	12.99
Associated-Dissolved 4/.....	1.60	1.54	1.54	1.52	1.50	1.47	1.45	1.43	1.41	1.39	1.37	1.35	1.33	1.31	1.29	1.28	1.26	1.25	1.23	1.22	1.21	1.20	1.18	1.17
Non-Associated.....	12.16	12.15	11.85	11.44	11.51	11.52	11.63	11.57	11.62	11.84	12.11	11.87	11.57	11.93	12.21	12.23	12.25	12.21	12.32	12.33	12.24	12.10	11.97	11.83
Conventional.....	6.23	6.16	6.31	6.24	6.22	6.14	6.17	6.15	6.19	6.31	6.46	6.38	6.22	6.40	6.48	6.44	6.45	6.47	6.50	6.51	6.41	6.30	6.21	6.12
Unconventional.....	5.93	5.99	5.54	5.20	5.29	5.37	5.46	5.42	5.43	5.53	5.64	5.49	5.35	5.53	5.72	5.79	5.79	5.74	5.82	5.82	5.83	5.80	5.76	5.71
Lower 48 Offshore.....	4.86	5.23	5.15	5.20	5.09	5.22	5.12	5.21	5.61	5.53	5.41	5.20	5.22	5.23	5.23	5.27	5.14	5.10	5.04	4.78	4.71	4.68	4.99	5.11
Associated-Dissolved 4/.....	1.05	1.13	1.16	1.16	1.16	1.48	1.76	1.70	1.61	1.52	1.44	1.36	1.35	1.35	1.40	1.41	1.36	1.37	1.34	1.25	1.24	1.23	1.36	1.44
Non-Associated.....	3.81	4.10	3.99	4.05	3.93	3.74	3.35	3.51	3.99	4.01	3.97	3.84	3.87	3.88	3.83	3.86	3.77	3.73	3.69	3.54	3.47	3.45	3.63	3.67
Alaska.....	0.43	0.51	0.54	0.56	0.57	0.58	0.59	0.59	0.60	0.61	0.62	1.43	2.25	2.25	2.26	2.27	2.47	2.66	2.67	2.68	2.68	2.69	2.70	2.71
L48 EOY Dry Gas Reserves (tcf)..	176.9	175.3	176.3	177.3	178.2	176.6	176.2	176.8	176.1	175.2	173.7	174.0	173.4	172.1	171.3	170.0	168.0	166.8	164.8	163.4	161.5	160.3	158.2	155.8
Supplemental Gas Supplies (tcf)5/	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lower 48 Wells (thousands).....	24.47	27.52	26.50	26.80	26.40	25.54	25.44	25.39	24.71	24.92	25.32	25.59	25.16	25.41	25.89	25.99	26.02	26.11	26.56	26.61	26.44	26.23	25.97	25.89

1/ Represents lower 48 onshore and offshore supplies.

2/ Includes lease condensate.

3/ Marketed production (wet) minus extraction losses.

4/ Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

5/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

tcf = trillion cubic feet

L48 = Lower 48 States

EOY = End-of-year

bbl = billion barrels

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 and 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), Petroleum Supply Annual 2002, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2001 U.S. crude oil and natural gas reserves: EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, DOE/EIA-0216(2001) (Washington, DC, November 2002). 2001 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2001 and 2002 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2004 National Energy Modeling System run ug0tec03.d020404b.



**Combined Low Supply Case**

Table C13. Electricity Supply, Disposition, Prices, and Emissions  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Generation by Fuel Type</b>																								
<b>Electric Power Sector 1/ Power Only 2/</b>																								
Coal.....	1875	1945	1946	2002	2059	2111	2129	2165	2193	2219	2243	2269	2294	2334	2375	2427	2480	2551	2638	2731	2854	2995	3085	3199
Petroleum.....	77	103	62	74	74	75	82	80	85	109	134	178	211	201	325	296	279	290	284	266	268	204	212	191
Natural Gas 3/.....	450	407	490	486	502	519	556	574	603	616	627	617	613	640	550	593	623	610	598	588	551	573	571	564
Nuclear Power.....	780	762	779	791	794	795	796	791	794	800	803	806	809	812	814	816	816	816	816	816	816	816	816	816
Pumped Storage/Other.....	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
Renewable Sources 4/.....	304	339	374	379	384	388	393	397	407	411	415	419	429	437	443	448	461	476	491	511	513	515	519	528
Distributed Gen (Natural Gas)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3	3	3	3
Non-Utility Gen for Own Use..	-34	-39	-40	-40	-40	-40	-40	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37	-37
Total.....	3443	3508	3602	3683	3763	3838	3906	3961	4036	4109	4175	4242	4310	4378	4461	4536	4614	4699	4784	4868	4959	5061	5160	5256
<b>Combined Heat and Power 5/</b>																								
Coal.....	32	28	29	30	32	33	34	33	33	33	33	33	33	34	34	34	33	33	33	33	33	33	33	33
Petroleum.....	6	5	1	2	1	1	2	2	3	5	8	12	14	12	19	16	15	14	14	13	14	10	11	9
Natural Gas.....	148	152	158	156	158	162	167	174	172	169	167	160	155	154	143	144	144	141	140	136	133	132	132	131
Renewable Sources.....	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Non-Utility Gen for Own Use..	-11	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24
Total.....	183	165	168	168	171	176	183	189	188	187	188	185	182	180	175	174	172	169	167	162	160	155	156	153
Net Available to the Grid.....	3626	3674	3770	3851	3934	4015	4089	4150	4224	4296	4364	4427	4493	4558	4636	4710	4786	4868	4951	5030	5120	5216	5315	5409
<b>End-Use Sector Generation</b>																								
<b>Combined Heat and Power 6/</b>																								
Coal.....	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Petroleum.....	5	5	5	8	9	10	10	11	12	13	15	16	18	18	18	19	19	19	19	19	19	19	19	19
Natural Gas.....	84	84	85	88	92	94	98	102	106	109	113	115	118	121	124	126	129	132	135	138	141	144	147	150
Other Gaseous Fuels 7/.....	5	6	6	8	8	8	9	9	9	10	10	10	11	11	11	11	12	12	12	13	13	13	13	13
Renewable Sources 4/.....	30	31	32	34	35	36	36	37	39	40	41	43	44	45	46	47	48	49	49	50	51	52	53	54
Other 8/.....	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Total.....	157	158	161	171	177	180	185	192	198	204	211	217	223	227	231	235	240	244	248	252	256	260	264	268
Other End-Use Generators 9/...	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7	7
Generation for Own Use.....	-134	-134	-136	-144	-147	-148	-150	-153	-157	-159	-162	-164	-167	-169	-172	-174	-177	-179	-182	-185	-187	-190	-193	-196
Total Sales to the Grid.....	27	28	30	31	34	37	39	43	47	50	54	57	61	63	65	67	68	70	72	73	75	76	78	80
Total Electricity Generation....	3831	3899	3999	4090	4179	4264	4343	4408	4489	4567	4641	4710	4782	4851	4933	5011	5092	5178	5266	5350	5443	5543	5647	5746
Net Imports.....	22	40	30	33	29	28	30	32	33	34	37	41	38	36	39	36	32	26	27	22	19	13	8	7

**Combined Low Supply Case**

Table C13. Electricity Supply, Disposition, Prices, and Emissions (Continued)  
(Billion Kilowatthours, Unless Otherwise Noted)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Electricity Sales by Sector</b>																								
Residential.....	1268	1282	1301	1316	1335	1357	1383	1400	1422	1442	1464	1479	1498	1518	1542	1558	1577	1597	1622	1639	1663	1689	1717	1735
Commercial.....	1208	1213	1252	1293	1331	1366	1401	1435	1471	1506	1538	1572	1604	1634	1665	1695	1727	1763	1799	1833	1868	1903	1940	1979
Industrial.....	994	978	1002	1028	1050	1072	1087	1101	1119	1138	1154	1176	1189	1205	1228	1249	1269	1286	1306	1325	1349	1375	1399	1428
Transportation.....	22	23	23	24	24	25	25	26	26	27	27	28	28	29	30	30	31	31	32	33	33	34	35	35
Total.....	3492	3495	3579	3661	3740	3820	3897	3962	4038	4112	4184	4254	4320	4387	4465	4533	4604	4678	4759	4830	4913	5000	5091	5177
<b>End-Use Prices 10/ (2002 cents per kilowatthour)</b>																								
Residential.....	8.4	8.5	8.4	8.3	8.2	8.1	8.1	8.1	8.1	8.2	8.3	8.3	8.4	8.4	8.5	8.5	8.5	8.5	8.6	8.5	8.5	8.3	8.4	8.4
Commercial.....	7.8	7.6	7.4	7.3	7.2	7.0	7.0	7.1	7.2	7.3	7.4	7.4	7.5	7.5	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.6	7.6	7.6
Industrial.....	5.0	4.8	4.7	4.7	4.6	4.6	4.7	4.7	4.7	4.8	4.8	4.9	4.9	5.0	5.1	5.1	5.2	5.2	5.2	5.2	5.1	5.0	5.0	5.0
Transportation.....	7.2	7.3	7.1	7.0	6.8	6.7	6.7	6.8	6.8	6.9	7.0	7.1	7.2	7.2	7.3	7.3	7.3	7.2	7.2	7.2	7.1	7.0	7.0	7.0
All Sectors Average.....	7.2	7.2	7.0	6.9	6.8	6.7	6.7	6.8	6.8	6.9	7.0	7.0	7.1	7.1	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.1	7.2	7.1
<b>Prices by Service Category 10/ (2002 cents per kilowatthour)</b>																								
Generation.....	4.6	4.6	4.5	4.4	4.3	4.3	4.3	4.3	4.3	4.4	4.5	4.6	4.6	4.7	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.7	4.8	4.7
Transmission.....	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Distribution.....	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
<b>Emissions</b>																								
Sulfur Dioxide (million tons).....	10.57	10.63	10.70	10.19	10.17	10.01	9.59	9.61	9.81	10.09	9.61	9.45	9.30	9.03	9.01	8.99	8.94	8.95	8.95	8.95	8.97	8.94	8.95	8.94
Nitrogen Oxide (million tons).....	4.39	3.71	3.22	3.28	3.36	3.43	3.46	3.48	3.50	3.53	3.55	3.58	3.59	3.61	3.64	3.67	3.65	3.65	3.67	3.66	3.68	3.70	3.72	3.73
Mercury (tons).....	51.55	51.66	50.45	50.89	51.98	52.74	51.78	52.50	53.04	53.74	53.81	53.42	53.55	53.40	54.14	54.01	54.03	54.24	54.77	54.88	55.38	55.99	56.02	56.28

1/ Includes electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public.  
2/ Includes plants that only produce electricity.  
3/ Includes electricity generation from fuel cells.  
4/ Includes conventional hydroelectric, geothermal, wood, wood waste, municipal solid waste, landfill gas, other biomass, solar, and wind power.  
5/ Includes combined heat and power plants whose primary business is to sell electricity and heat to the public (i.e., those that report NAICS code 22).  
6/ Includes combined heat and power plants and electricity-only plants in the commercial and industrial sectors.  
7/ Other gaseous fuels include refinery and still gas.  
8/ Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.  
9/ Other end-use generators include small on-site generating systems in the residential, commercial, and industrial sectors used primarily for own-use generation, but which may also sell some power to the grid.  
10/ Prices represent average revenue per kilowatthour.  
Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.  
Sources: 2001 and 2002 power only and combined heat and power generation, sales to utilities, net imports, residential, industrial, and total electricity sales, and emissions: Energy Information Administration (EIA), Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) and supporting databases. 2001 and 2002 commercial and transportation electricity sales: EIA estimates based on Oak Ridge National Laboratory, Transportation Energy Data Book 21 (Oak Ridge, TN, November 2001). 2001 and 2002 prices: EIA, AEO2004 National Energy Modeling System run aeo2004.d101703e. Projections: EIA, AEO2004 National Energy Modeling System run lowgas01.d020404a.

**Combined Low Supply Case**

Table C14. Natural Gas Supply and Disposition  
(Trillion Cubic Feet per Year)

Supply, Disposition, and Prices	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Production</b>																								
Dry Gas Production 1/.....	19.05	19.43	19.06	18.73	18.66	18.84	18.98	19.04	19.54	19.87	19.91	19.94	20.19	20.30	20.53	20.75	20.72	20.67	20.60	20.49	20.50	20.37	20.34	20.18
Supplemental Natural Gas 2/..	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
<b>Net Imports.....</b>																								
Canada.....	3.49	3.54	3.80	4.25	4.79	5.09	5.53	5.71	5.76	5.69	5.80	5.66	5.50	5.48	5.40	5.39	5.36	5.37	5.50	5.66	5.82	6.08	6.33	6.52
Mexico.....	3.59	3.43	3.70	3.81	3.87	3.91	3.97	4.07	4.12	3.99	3.93	3.70	3.45	3.41	3.30	3.21	3.08	2.99	3.07	3.16	3.24	3.36	3.45	3.54
Liquefied Natural Gas.....	-0.26	-0.31	-0.42	-0.42	-0.43	-0.39	-0.34	-0.29	-0.29	-0.28	-0.20	-0.12	-0.02	-0.01	0.02	0.11	0.20	0.31	0.36	0.42	0.50	0.64	0.80	0.90
	0.17	0.43	0.52	0.86	1.35	1.57	1.90	1.93	1.93	1.98	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08	2.08
<b>Total Supply.....</b>	<b>22.62</b>	<b>23.04</b>	<b>22.94</b>	<b>23.08</b>	<b>23.54</b>	<b>24.02</b>	<b>24.60</b>	<b>24.85</b>	<b>25.39</b>	<b>25.65</b>	<b>25.80</b>	<b>25.70</b>	<b>25.79</b>	<b>25.87</b>	<b>26.02</b>	<b>26.24</b>	<b>26.18</b>	<b>26.14</b>	<b>26.20</b>	<b>26.24</b>	<b>26.42</b>	<b>26.54</b>	<b>26.76</b>	<b>26.80</b>
<b>Consumption by Sector</b>																								
Residential.....	4.92	5.07	5.14	5.15	5.22	5.29	5.36	5.40	5.45	5.48	5.50	5.48	5.50	5.53	5.55	5.56	5.59	5.62	5.67	5.69	5.73	5.78	5.85	5.87
Commercial.....	3.12	3.17	3.09	3.14	3.21	3.27	3.31	3.36	3.41	3.44	3.45	3.45	3.47	3.49	3.49	3.52	3.55	3.57	3.60	3.64	3.67	3.73	3.77	3.81
Industrial 3/.....	7.23	7.21	7.50	7.58	7.72	7.86	7.94	8.07	8.25	8.39	8.45	8.52	8.56	8.64	8.65	8.76	8.85	8.92	9.02	9.10	9.24	9.38	9.50	9.62
Electric Generators 4/.....	5.55	4.87	5.56	5.52	5.67	5.84	6.17	6.14	6.32	6.36	6.41	6.24	6.23	6.19	6.21	6.28	6.10	5.94	5.82	5.71	5.65	5.54	5.54	5.38
Transportation 5/.....	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.11
Pipeline Fuel.....	0.63	0.66	0.63	0.62	0.61	0.62	0.62	0.63	0.64	0.65	0.65	0.65	0.65	0.66	0.66	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Lease and Plant Fuel 6/.....	1.32	1.00	0.98	1.03	1.08	1.14	1.19	1.25	1.32	1.34	1.35	1.35	1.37	1.38	1.40	1.41	1.41	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Total.....	22.78	21.99	22.92	23.07	23.55	24.05	24.64	24.89	25.45	25.72	25.87	25.77	25.85	25.96	26.04	26.28	26.25	26.22	26.29	26.32	26.48	26.62	26.85	26.88
Gas to Liquids.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Discrepancy 7/.....</b>	<b>-0.16</b>	<b>1.06</b>	<b>0.02</b>	<b>0.01</b>	<b>-0.01</b>	<b>-0.02</b>	<b>-0.03</b>	<b>-0.05</b>	<b>-0.06</b>	<b>-0.06</b>	<b>-0.07</b>	<b>-0.07</b>	<b>-0.06</b>	<b>-0.09</b>	<b>-0.02</b>	<b>-0.04</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.07</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>

1/ Marketed production (wet) minus extraction losses.

2/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

3/ Includes consumption for combined heat and power, which produces electricity and other useful thermal energy.

4/ Includes consumption of energy by electricity-only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Includes small power producers and exempt wholesale generators.

5/ Compressed natural gas used as vehicle fuel.

6/ Represents natural gas used in the field gathering and processing plant machinery.

7/ Balancing item. Natural gas lost as a result of converting flow data measured at varying temperatures and pressures to a standard temperature and pressure and the merger of different data reporting systems which vary in scope, format, definition, and respondent type. In addition, 2001 and 2002 values include net storage injections.

Btu = British thermal unit.

N/A = Not applicable.

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 supply values: Energy Information Administration (EIA), Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 supply values: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). 2001 and 2002 consumption based on: EIA, Annual Energy Review 2001, DOE/EIA-0384(2001) (Washington, DC, October 2002) Projections: EIA, AEO2004 National Energy Modeling System run lowgas01.d020404a.

**Combined Low Supply Case**

Table C15. Oil and Gas Supply

Production and Supply	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Crude Oil</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per barrel).....	24.54	27.29	24.36	22.79	22.90	23.12	23.25	23.45	23.59	24.07	23.95	24.23	24.43	24.74	24.81	25.17	25.12	25.60	25.52	26.13	26.02	26.66	26.54	26.76
<b>Production (mmbbls per day) 2/</b>																								
United States Total.....	5.62	5.69	5.80	5.86	5.94	6.10	6.12	6.06	5.95	5.83	5.69	5.65	5.61	5.60	5.51	5.36	5.30	5.14	4.99	4.90	4.87	5.01	4.96	4.78
Lower 48 Onshore.....	3.11	2.93	2.95	2.91	2.83	2.78	2.72	2.67	2.61	2.56	2.52	2.47	2.43	2.39	2.35	2.32	2.28	2.25	2.22	2.18	2.15	2.12	2.09	2.06
Lower 48 Offshore.....	1.53	1.78	1.90	2.06	2.23	2.41	2.46	2.46	2.41	2.34	2.25	2.24	2.23	2.27	2.24	2.18	2.19	2.13	2.05	2.04	2.08	2.31	2.33	2.21
Alaska.....	0.98	0.98	0.95	0.90	0.88	0.91	0.93	0.94	0.92	0.92	0.92	0.93	0.95	0.93	0.91	0.87	0.82	0.77	0.72	0.67	0.63	0.58	0.54	0.51
L48 EOY Oil Reserves (bbls) 2/..	19.05	19.24	18.98	18.62	18.65	18.93	18.89	18.70	18.41	18.11	17.69	17.52	17.35	17.35	17.13	16.85	16.74	16.59	16.19	15.98	15.90	16.10	15.82	15.32
<b>Natural Gas</b>																								
L48 Average Wellhead Price 1/ (2002 dollars per tcf).....	2.95	5.21	4.30	4.02	3.91	3.89	3.99	3.86	3.87	4.19	4.51	4.77	4.85	5.02	5.16	5.21	5.37	5.54	5.53	5.60	5.51	5.50	5.51	5.61
<b>Dry Production (tcf) 3/</b>																								
United States Total.....	19.05	19.43	19.06	18.74	18.66	18.84	18.98	19.04	19.54	19.87	19.91	19.95	20.19	20.30	20.53	20.75	20.73	20.67	20.61	20.49	20.50	20.37	20.34	20.18
Lower 48 Onshore.....	13.76	13.69	13.37	12.97	13.01	13.10	13.24	13.21	13.30	13.63	13.87	14.02	14.19	14.35	14.56	14.71	14.90	14.90	14.87	14.74	14.58	14.35	14.19	14.10
Associated-Dissolved 4/.....	1.60	1.54	1.54	1.52	1.50	1.47	1.45	1.43	1.41	1.39	1.37	1.35	1.33	1.31	1.30	1.28	1.27	1.25	1.24	1.22	1.21	1.20	1.19	1.17
Non-Associated.....	12.16	12.15	11.83	11.45	11.51	11.62	11.78	11.78	11.89	12.24	12.51	12.67	12.86	13.04	13.26	13.43	13.63	13.64	13.63	13.52	13.37	13.15	13.01	12.93
Conventional.....	6.23	6.16	6.31	6.24	6.22	6.22	6.25	6.20	6.32	6.50	6.64	6.69	6.79	6.88	6.94	6.98	7.05	7.02	7.02	6.96	6.88	6.76	6.69	6.65
Unconventional.....	5.93	5.99	5.53	5.21	5.30	5.41	5.53	5.58	5.57	5.74	5.87	5.98	6.07	6.16	6.33	6.45	6.59	6.63	6.61	6.56	6.50	6.40	6.32	6.28
Lower 48 Offshore.....	4.86	5.23	5.15	5.20	5.09	5.17	5.16	5.24	5.64	5.63	5.42	5.30	5.37	5.31	5.33	5.39	5.17	5.11	5.06	5.06	5.22	5.32	5.44	5.37
Associated-Dissolved 4/.....	1.05	1.13	1.16	1.16	1.16	1.48	1.76	1.70	1.61	1.52	1.44	1.36	1.35	1.35	1.40	1.41	1.37	1.36	1.33	1.29	1.30	1.33	1.53	1.52
Non-Associated.....	3.81	4.10	3.99	4.05	3.93	3.68	3.40	3.55	4.03	4.11	3.98	3.95	4.03	3.96	3.93	3.97	3.80	3.75	3.73	3.78	3.92	3.98	3.91	3.85
Alaska.....	0.43	0.51	0.54	0.56	0.57	0.58	0.59	0.59	0.60	0.61	0.62	0.62	0.63	0.64	0.65	0.65	0.66	0.67	0.68	0.68	0.69	0.70	0.71	0.72
L48 EOY Dry Gas Reserves (tcf)..	176.9	175.3	176.4	177.3	178.2	176.9	176.5	176.8	176.1	175.2	173.8	174.1	173.7	173.6	174.0	173.9	172.1	171.4	169.6	168.6	166.4	163.4	159.8	156.5
Supplemental Gas Supplies (tcf)5/	0.08	0.08	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Lower 48 Wells (thousands).....	24.47	27.52	26.49	26.79	26.40	25.92	25.73	25.18	24.99	25.46	25.83	26.65	27.01	27.96	28.54	28.61	28.60	28.68	28.51	28.66	28.33	28.59	28.40	28.19

1/ Represents lower 48 onshore and offshore supplies.

2/ Includes lease condensate.

3/ Marketed production (wet) minus extraction losses.

4/ Gas which occurs in crude oil reserves either as free gas (associated) or as gas in solution with crude oil (dissolved).

5/ Synthetic natural gas, propane air, coke oven gas, refinery gas, biomass gas, air injected for Btu stabilization, and manufactured gas commingled and distributed with natural gas.

tcf = trillion cubic feet

L48 = Lower 48 States

EOY = End-of-year

bbl = billion barrels

Note: Totals may not equal sum of components due to independent rounding. Data for 2001 and 2002 are model results and may differ slightly from official EIA data reports.

Sources: 2001 and 2002 lower 48 onshore, lower 48 offshore, and Alaska crude oil production: Energy Information Administration (EIA), Petroleum Supply Annual 2002, DOE/EIA-0340(2002)/1 (Washington, DC, June 2003). 2001 U.S. crude oil and natural gas reserves: EIA, U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, DOE/EIA-0216(2001) (Washington, DC, November 2002). 2001 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Annual 2001, DOE/EIA-0131(2001) (Washington, DC, February 2003). 2002 natural gas lower 48 average wellhead price, natural gas production, and supplemental gas supplies: EIA, Natural Gas Monthly, DOE/EIA-0130(2003/06) (Washington, DC, June 2003). Other 2001 and 2002 values: EIA, Office of Integrated Analysis and Forecasting. Projections: EIA, AEO2004 National Energy Modeling System run lowgas01.d020404a.