Statement of Guy Caruso, Administrator
Energy Information Administration
U.S. Department of Energy
before the
Subcommittee on Energy, Water Development, and Related Agencies
and the
Subcommittee on Interior, Environment and Related Agencies
Committee on Appropriations
U. S. House of Representatives
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Chairmen Hobson and Taylor, and Members of the Committee:

I appreciate the opportunity to appear before you today to discuss the Energy Information Administration's (EIA) outlook for natural gas markets. The projections that I am presenting are from EIA's October *Short-Term Energy Outlook*, which was released on October 12, and the *Annual Energy Outlook 2005*, which was published in February 2005. Both of these reports are available on our web site at www.eia.doe.gov. Our November *Short-Term Energy Outlook* was released yesterday but is not reflected in this written testimony due to the usual requirement to provide the testimony in advance of the hearing date. The latest *Outlook* will be reflected in my oral remarks, and is also available on our web site.

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The Short-Term Outlook for Natural Gas

Even before Hurricane Katrina struck, crude oil, petroleum product, and natural gas prices were very high by historical standards, with September futures prices at $10.85 per million Btu ($11.18 per thousand cubic feet), more than double the levels of 1 year before. In August, the Henry Hub natural gas spot price averaged more than $9 per thousand cubic feet, as hot weather in the East and Southwest increased natural gas-fired electricity generation for

cooling demand and crude oil prices increased. Natural gas spot market prices rose sharply in the days following Katrina, reaching $12.72 per thousand cubic feet on August 30, compared to $10.16 per thousand cubic feet on August 26. The spot price peaked at $13.08 per thousand cubic feet on August 31, but dropped to $11.70 per thousand cubic the following day. At the close of trading on Thursday, November 3, the Henry Hub spot price was $11.12 per thousand cubic feet, about $0.96 per thousand cubic feet higher than the price on Friday, August 26, before Hurricane Katrina.

Throughout the summer months, EIA warned about the potential adverse impacts of an active hurricane season on domestic energy supply and prices. These warnings unfortunately are being reflected in the challenging realities brought about by Hurricanes Katrina and Rita. Their impact on oil and natural gas production, oil refining, natural gas processing, and pipeline systems further strained already-tight markets for petroleum and natural gas on the eve of the 2005-2006 heating season. The devastation of Hurricane Katrina affected offshore natural gas production in the Gulf of Mexico as well as onshore natural gas processing facilities. Natural gas production in the Federal Gulf of Mexico, which normally accounts for 19 percent of total U.S. natural gas production, suffered a peak shut-in of 8.8 billion cubic feet on August 30, 2005. In anticipation of Hurricane Rita, production shut-ins began increasing again 3 weeks into September and were at or near the level of 8.0 billion cubic feet from September 25 through 30. As of November 3, the shut-in volume was down to about 4.7 billion cubic feet.

Projections are subject to considerable uncertainty. Price projections are particularly uncertain, because small shifts in either supply or demand, which are both relatively insensitive to price changes in the current market environment, can necessitate large price movements to restore balance between supply and demand. On the supply side, our October *Short –Term Energy Outlook* reflects a medium recovery scenario for the resumption of energy operations in the Gulf of Mexico based on information available to EIA as of the end of the first week of that month. On the demand side, the baseline projections incorporate the mean values for heating degree-days by Census Division as provided by the National Oceanic and Atmospheric Administration’s (NOAA) Climate Prediction Center.

This winter, residential space-heating expenditures are projected to increase for all fuel types compared to year-ago levels. On average, households heating primarily with natural gas are expected to spend about $350 (48 percent) more this winter in fuel expenditures. Households heating primarily with heating oil can expect to pay, on average, $378 (32 percent) more this winter. Households heating primarily with propane can expect to pay, on average, $325 (30 percent) more this winter. Households heating primarily with electricity can expect, on average, to pay $38 (5 percent) more. Should colder weather prevail, expenditures will be significantly higher. These averages provide a broad guide to changes from last winter, but fuel expenditures for individual households are highly dependent on local weather conditions, the size and energy efficiency of individual homes and their heating equipment, and thermostat settings.

Several factors are driving up winter prices and expenditures: first, international factors such as low spare crude oil capacity and political tensions contribute to uncertainty and low supply growth for crude oil and high crude oil prices; second, the recent hurricanes and associated disruptions exacerbate already tight markets in oil, petroleum products, and natural gas; and, finally, winter weather affects consumption and consequently household expenditures. This winter, we are likely to have slightly colder weather, as measured by population-weighted heating degree-days, relative to last winter. The prediction from NOAA is for a winter 3.2 percent colder than last winter in the lower 48 States and 0.4 percent colder than normal.

Overall, prices for petroleum products and natural gas are expected to remain high due to tight markets and hurricane-induced supply losses. Henry Hub spot natural gas prices are expected to average around $9.00 per thousand cubic feet in 2005 and around $8.70 per thousand cubic feet in 2006. Retail gasoline prices are expected to average close to $2.35 per gallon in 2005 and about $2.45 in 2006. Retail diesel fuel prices are projected to remain high throughout the forecast period, averaging $2.45 in 2005 and $2.58 in 2006. Residential retail heating oil prices are expected to be $2.54 per gallon this winter season, a 32-percent increase over last winter, reflecting not only high crude oil prices, but also strong demand in the international market for distillate fuels (which include heating oil). Residential electricity prices are expected to average 9.3 cents per kilowatthour in 2005 and about 9.5 cents per kilowatthour in 2006, with significant regional differences depending on the fuel mix used to

generate electricity in each region of the country. Should colder weather prevail, prices for natural gas and all petroleum products are projected to be somewhat higher.

Total U.S. natural gas demand is projected to fall by 1.2 percent from 2004 to 2005 due mainly to higher prices, but recover by 3.0 percent in 2006 due to an assumed return to normal weather (early 2005 was a relatively mild heating season in the Midwest) and a recovery in consumption by the industrial sector, which is projected to increase by about 6 percent over 2005 levels**.**

Residential natural gas demand is projected to decline slightly from 2004 to 2005, mostly because of relatively weak heating-related demand during the first quarter of 2005, while industrial demand is estimated to decline by nearly 8 percent over the same period due to the much higher prices for natural gas as a fuel or feedstock. By 2006, both end-use sectors recover somewhat with residential demand estimated to increase 2.6 percent from 2005 levels and industrial demand increasing by 6 percent. The industrial rebound in 2006 is partly because of assumed reactivation of damaged industrial plants in the Gulf of Mexico region, but also reflects renewed fuel demand growth as domestic industrial plants adjust to higher prices. Power-sector demand growth continues through the forecast period along with electricity demand growth. The pace is slower that the 5.7-percent rate projected for 2005 because an unusually hot summer and high cooling demand boosted 2005 growth significantly.

Domestic dry natural gas production in 2005 is expected to decline by 3.0 percent, due in large part to the major disruptions to infrastructure in the Gulf of Mexico from both Hurricanes Katrina and Rita, but to increase by 4.2 percent in 2006. Working gas in storage as of October 28 was estimated at 3.168 trillion cubic feet, a level 119 billion cubic feet below 1 year ago but still 2.6 percent above the 5-year average. Although natural gas storage remains above the 5-year average, the double blows of Hurricanes Katrina and Rita reduced the peak storage achievable over the remainder of the injection season from what was expected previously. Expected working gas in storage at the end of the fourth quarter is expected to be about 2.5 trillion cubic feet, 200 billion cubic feet below year-ago levels and about 50 billion cubic feet above the 5-year average. Hurricane recovery profiles that differ from the scenario used for this forecast would significantly affect the storage forecast.

The Impact of Natural Gas Prices on Industry

In the Consolidated Appropriations Act of 2005 (P.L. 108-447), Congress requested that the Secretary of Commerce, in cooperation with the Secretaries of Energy and Labor, prepare a study on the economic impacts of rising natural gas prices on energy-intensive industries in the United States. The report *Impacts of Rising Natural Gas Prices on the U.S. Economy and Industries* was prepared by the Economics and Statistics Administration (ESA) of the Department of Commerce, assisted by EIA and elements of the Department of Labor. The report was delivered to Congress on July 5, 2005, and can be found on ESA's web site at www.esa.doc.gov/natural_gas_final_report.pdf . In preparing this report, ESA sought comments from interested parties, and these comments can also be seen at the ESA web site.

Natural gas prices vary across countries, although price movements in the United States tend to track average prices in the 30 industrialized countries of the Organization for Economic Cooperation and Development. However, during the years 1999 to 2003, the United States experienced a slightly larger increase in industrial natural gas prices compared with most foreign countries, so that by 2002 and 2003 U.S. natural gas prices were higher in general than prices overseas. EIA expects that natural gas prices will moderate by the end of the decade, but they are unlikely to return to the low levels of the 1990s.

The report found that higher natural gas prices in the 2000-to-2004 period had a somewhat mild depressing effect on gross domestic product (GDP) but a more serious negative effect on employment, especially outside of the manufacturing sector. The report estimated that in 2000 and 2001, the higher prices reduced real GDP growth by 0.2 percentage points in each year. For 2002 through 2004, the growth rate was essentially unaffected. Total civilian employment was lower by an average of 489 thousand jobs in each year. Manufacturing employment was lower by an average of 79 thousand jobs, about 16 percent of the total lost civilian jobs.

The report found that that there is no clear evidence, except for nitrogenous fertilizer manufacturing, that higher natural gas prices were the primary reason for the poor economic performance of natural gas-intensive industries from 2000 to 2004. The performance of U.S. natural gas-intensive industries, as measured by industry shipments, product prices,

employment and wages, and capital expenditures, had been suffering prior to that time. Higher natural gas prices imposed additional difficulties on these industries; however, except in the case of nitrogenous fertilizer manufacturing, the higher prices explain only a small portion of the industries' weak economic performance from 2000 to 2004. International trade in natural gas-intensive industries does not show either decreases in their U. S. exports relative to shipments or increases in their imports relative to consumption that might suggest deteriorating competitive conditions in the industry.

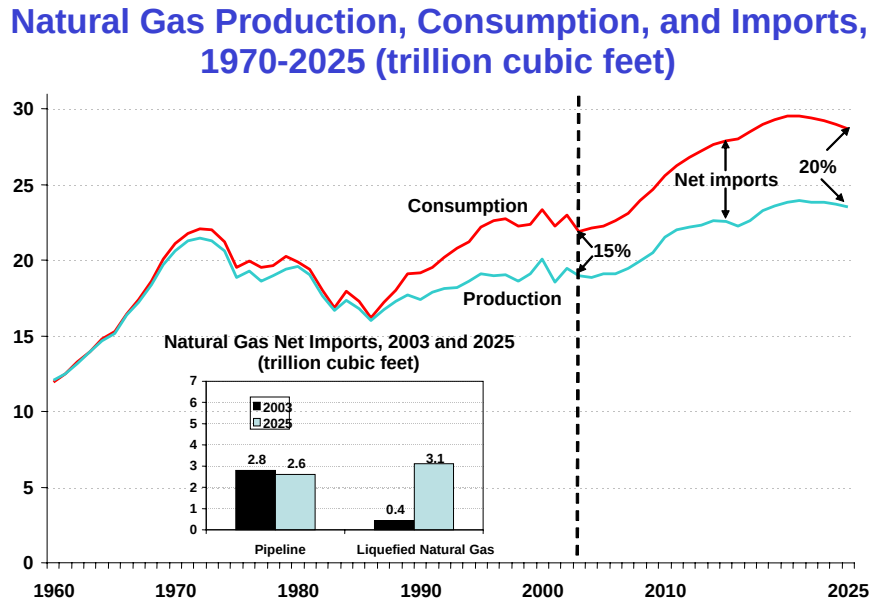
The Mid-Term Outlook for Natural Gas

The projections in the *Annual Energy Outlook 2005* were developed in the second half of 2004. Because of the uncertainty of crude oil prices at that time, EIA analyzed a wider range of potential crude oil price cases than usual. The projections discussed in this testimony are based upon the case with the highest assumed world oil prices, called the High B case. Our mid-term outlook will be updated very soon with the release of the reference case of the *Annual Energy Outlook 2006* in early December.

World oil prices, measured as the imported refiners' acquisition cost (IRAC), which is currently more than $6 per barrel below the price of West Texas Intermediate (WTI) that is widely quoted in press reports, averaged about $35.07 per barrel in 2004 (2003 dollars). In the highest price case in the *Annual Energy Outlook 2005*, projected oil prices in IRAC terms are assumed to decline from the current high level to $37.00 per barrel in 2010 and subsequently rise to $48.00 per barrel in 2025, all in constant 2003 dollars. World oil demand is expected to increase from 80 million barrels per day in 2003 to 111 million barrels per day in 2025.

By 2025, total U.S. natural gas consumption is expected to increase to almost 29 trillion cubic feet or 22 percent of total U.S. energy consumption. Domestic natural gas production is expected to increase more slowly than consumption over the forecast, rising from 19.0 trillion cubic feet in 2003 to 23.5 trillion cubic feet in 2025. The difference between consumption and production is made up by increasing imports, particularly liquefied natural gas (LNG), with a 2.7-trillion-cubic-foot net increase expected over 2003 levels. By 2025,

we expect expansion at three of the five existing LNG import terminals and construction of several new terminals.

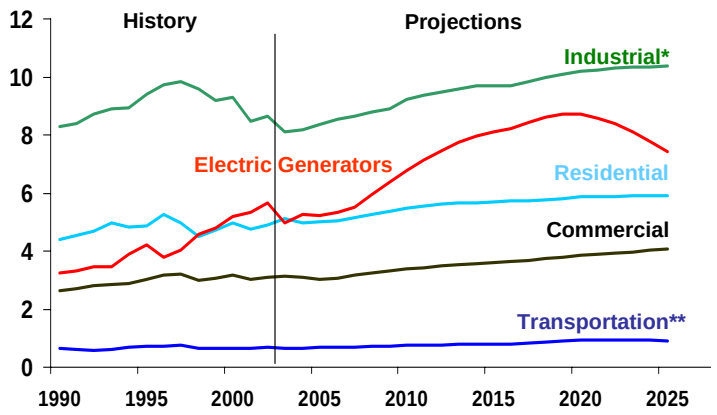


Source: *Annual Energy Outlook 2005-High B Oil Price Case*

Consumption. U.S. natural gas consumption is expected to increase at an average annual rate of 1.1 percent between 2003 and 2025. Natural gas consumption by electric generators is expected to increase by about 45 percent over the forecast, from 5.1 trillion cubic feet in 2003 to 7.4 trillion cubic feet in 2025, an average annual growth of 1.7 percent. Demand by electricity generators is expected to account for 26 percent of total natural gas consumption in 2025.

Most new electricity generation capacity is expected to be fueled by natural gas, which is expected to be favored over coal due to lower capital costs, higher fuel efficiencies, shorter construction lead times, and lower emissions, which outweigh the higher fuel costs. After 2020, however, the steady increases in natural gas prices cause natural gas to begin losing market share to coal.

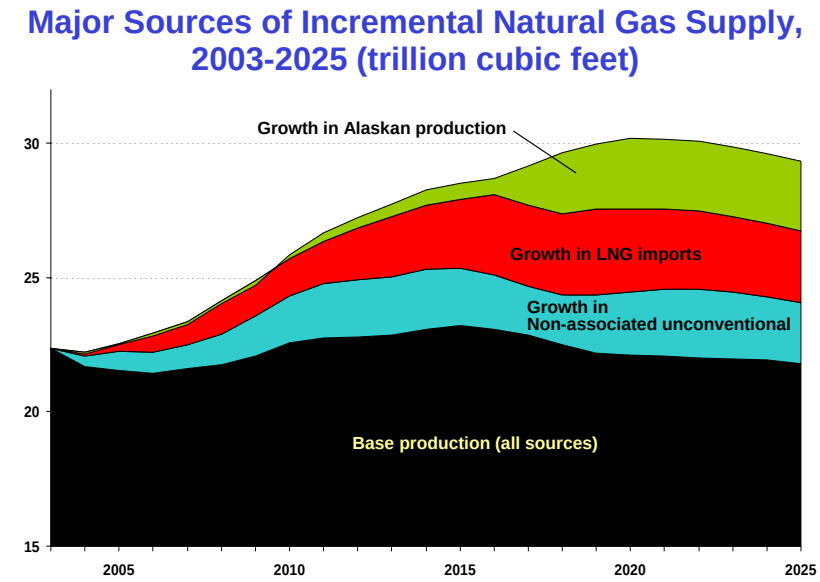
U.S. Natural Gas Consumption by Sector, 1990-2025 (trillion cubic feet)



* Includes lease and plant fuel
** Includes pipeline fuel
Source: *Annual Energy Outlook 2005-High B Oil Price Case*

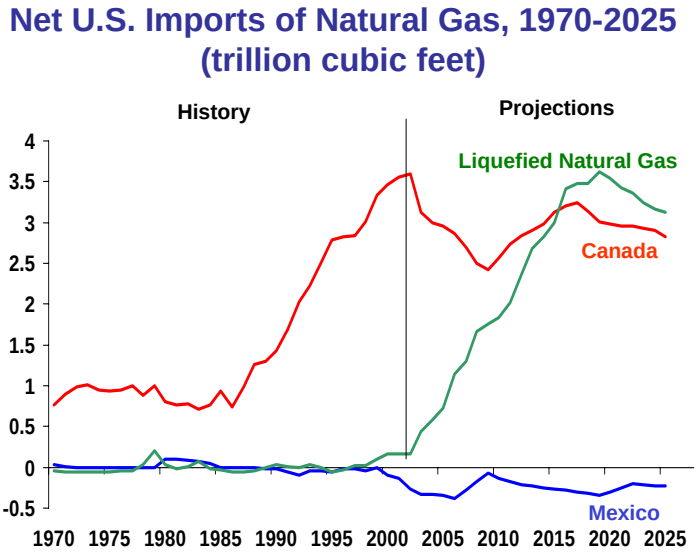
The industrial sector is the largest natural gas-consuming sector, with significant amounts used in the bulk chemical and refining sectors. Industrial consumption, excluding lease and plant fuel, is expected to increase by 2.0 trillion cubic feet over the forecast period, responding to economic growth. Combined consumption in the residential and commercial sectors is projected to increase by 1.7 trillion cubic feet from 2003 to 2025, driven by increasing population and economic growth. Natural gas remains the overwhelming choice for home heating throughout the forecast period.

Production. Increasing natural gas production is supported by rising wellhead natural gas prices, relatively abundant resources, and improvements in production technologies, particularly for unconventional natural gas. Increased U.S. natural gas production through 2025 comes primarily from unconventional sources and from Alaska. Unconventional natural gas production increases by 2.3 trillion cubic feet over the forecast period, largely because of expanded tight sands gas production in the Rocky Mountain region. Annual production from unconventional sources is expected to account for 38 percent of production in 2025, more than any other source, compared to 35 percent today. Economic conditions allow an Alaskan pipeline to begin moving natural gas to the lower-48 States in 2017. Alaska accounts for most of the growth in domestic natural gas production, growing by 2.6 trillion cubic feet over the forecast period. Lower-48 onshore non-associated conventional natural gas production declines by about 650 billion cubic feet through 2025, as resource depletion causes exploration and development costs to increase.



Source: *Annual Energy Outlook 2005-High B Oil Price Case*

Imports. Net imports of natural gas, primarily from LNG and Canada, are projected to increase from 3.2 trillion cubic feet in 2003 to 5.7 trillion cubic feet in 2025. Imports contributed 14 percent to total natural gas supply in 2003, compared to an expected 19 percent in 2025.



Source: *Annual Energy Outlook 2005-High B Oil Price Case*

LNG is expected to supply all of the increase in U.S. imports. We expect that existing LNG terminals will be expanded and that new facilities will be constructed. LNG imports are

expected to reach 3.6 trillion cubic feet in 2019 and then decline to 3.1 trillion cubic feet in 2025, as rising natural gas prices cause a decline in demand. In 2025, LNG is expected to equal 11 percent of total U.S. supply. Net Canadian imports are expected to provide 10 percent of total U.S. supply in 2025, down from 14 percent in 2003.

Prices. In the *Annual Energy Outlook 2005* High B case, average natural gas wellhead prices are projected to decline from current high levels to $3.74 per thousand cubic feet in 2010, in 2003 dollars, due to expanded imports and production of unconventional and offshore natural gas. After 2010, wellhead prices are projected to increase gradually, reaching $5.32 per thousand cubic feet in 2025 in 2003 dollars. Ultimately, the growth in unconventional sources, Alaskan production, and LNG imports are not expected to increase enough to offset the impacts of resource depletion and increased demand.

End-use natural gas prices are expected to reflect the trend of increasing wellhead prices. A portion of the increase in wellhead prices is expected to be offset by a projected decline in average transmission and distribution margins as a larger proportion of the natural gas delivery infrastructure becomes fully depreciated. Residential consumers, who generally pay the highest costs for distribution infrastructure, will see the largest offset.

In conclusion, due to continued tight crude oil markets, hurricane-related supply disruptions, and slightly colder projected weather, the average U.S. household heating with natural gas can expect to pay about $350 more for heating this winter,. These projections are subject to considerable uncertainty, depending in part on the rate of recovery in the Gulf of Mexico and on the weather. A winter that is colder than expected could substantially raise estimated expenditure increases; milder weather, of course, would lower estimated expenditures.

This completes my testimony, Chairmen Hobson and Taylor. I would be glad to answer any questions that you and the other members of the Committee may have.