

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

HEARINGS ON THE IMPACT OF CLEAN AIR REGULATIONS
ON NATURAL GAS PRICES

TESTIMONY OF JOEL BLUESTEIN
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Thank you Mr. Chairman and members of the Committee for the opportunity to testify today. My name is Joel Bluestein and I am the President of Energy and Environmental Analysis, Inc. EEA is located in Arlington, Virginia and has been providing energy and environmental consulting services since 1974. Our major areas of expertise include:

- Analyzing and forecasting the supply, demand and price of natural gas
- Analyzing the impacts of energy and environmental policy on energy markets

We have done this work for industry, government and institutional clients.

The spot price of natural gas has increased substantially over the last 5 years. Excluding the temporary effects of the hurricanes in late 2005, the prices have increased from the \$2 to \$3/MMBtu range to the \$8/MMBtu range. While the prices paid by most consumers have not increased proportionally, the higher prices have certainly created hardships for retail gas users as well as for business and industry.

The reason for this rapid increase in gas prices is widely agreed to be a combination of growing demand and limited supply for natural gas. Both sides of this equation must be addressed in order to find a solution. On the demand side, the power generation sector is the fastest growing component of the natural gas consuming sector. Almost all of the power plants built in the last 15 years have been gas-fired. Over 200 GW, of new natural gas-fired power plants have been built in the last five to six years, the largest such increase in power plant capacity in our history.

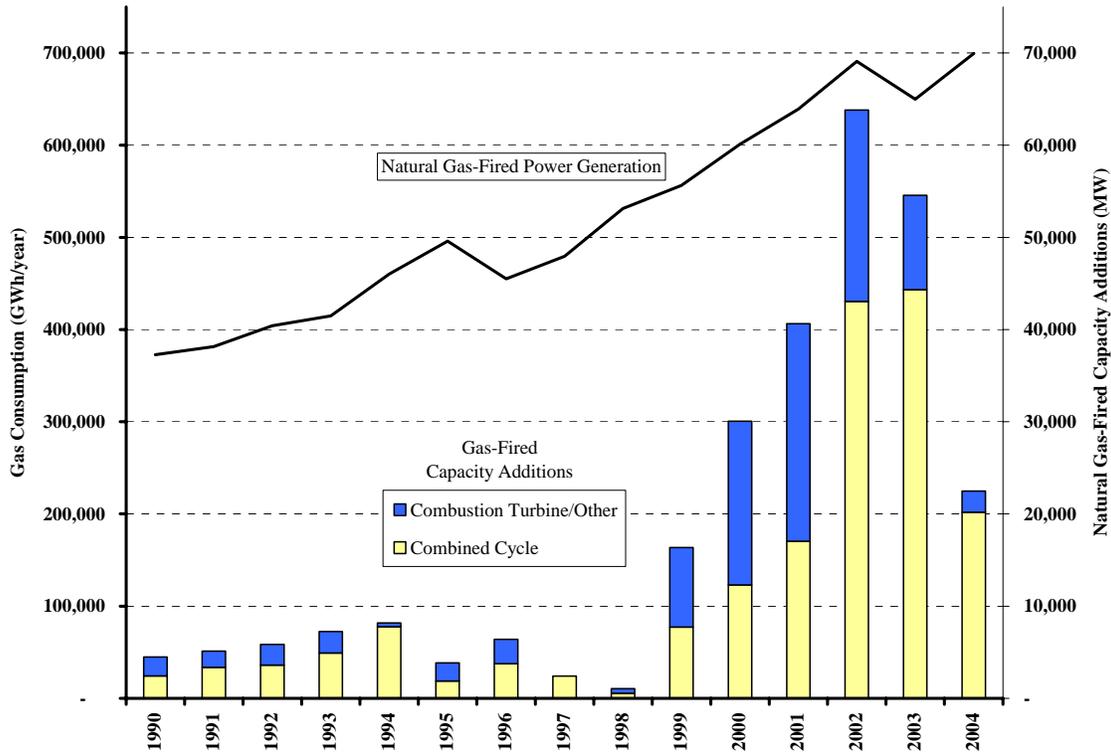
There is a common belief that these new gas plants are the cause of the increase in gas consumption for power generation and that the recent focus on gas-fired power plants is due primarily to environmental regulation. The corollary to the second belief is that if we could just somehow change the existing environmental regulations then there would be a big shift to coal-fired power plants, gas consumption would go down and gas prices would go back to \$3/MMBtu. Unfortunately, all of these last assumptions are incorrect.

The historical data¹ clearly show (Figure 1) that gas-fired electricity generation has been increasing continuously and at about the same rate since at least 1990, well before the recent boom in power plant construction and the increase in natural gas prices. From 1990 to about 1999 there was very little construction of new power plants, in large part

¹ All data in this testimony are from the U.S. Energy Information Administration unless otherwise noted.

due to the uncertainty about restructuring of the electric power industry. From 1999 to 2005, over 200 GW of new gas-fired generating capacity was built in the United States. However, this construction has not increased the growth rate of gas-fired generation. In fact, the growth declined slightly from 2002 through 2004.

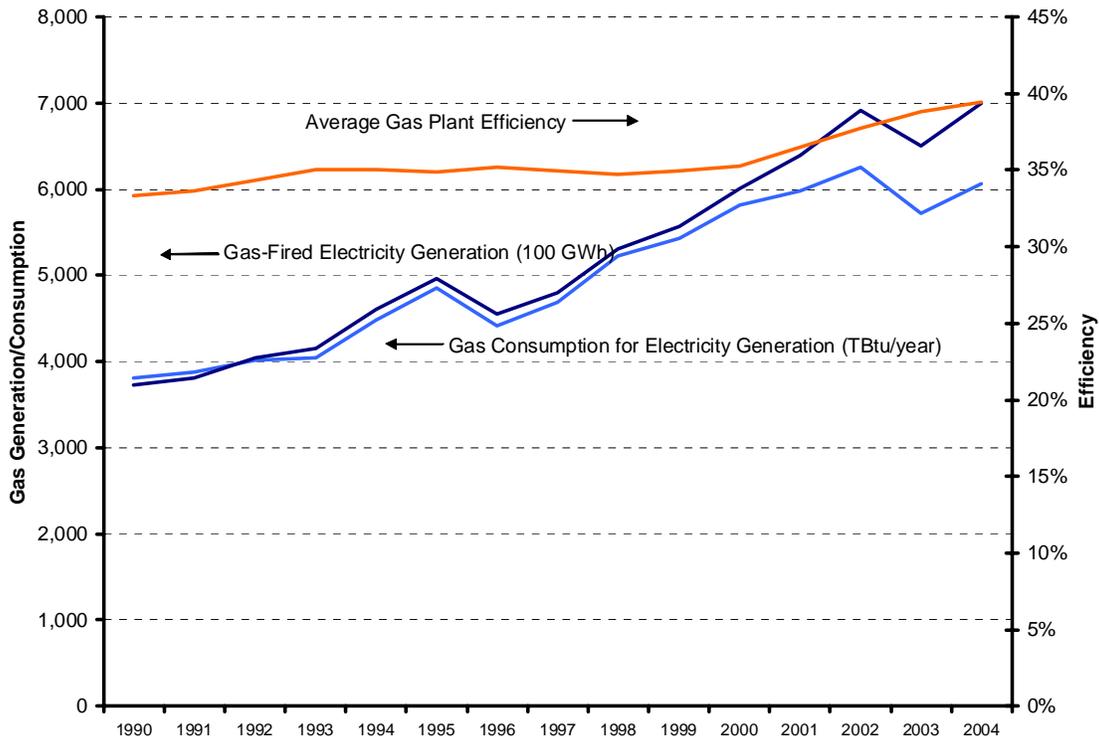
Figure 1 - Historical Gas Fired Generation and Plant Construction



Not only have the new power plants not increased gas consumption, they actually have reduced gas consumption relative to what would have occurred in their absence. This is because many of the new plants were built in regions that were already dependent on older, less efficient gas power plants. In these regions, such as Texas and California, the new, more efficient plants have displaced the older less efficient power plants, reducing the amount of gas that would have otherwise been consumed. Figure 2 shows the effect of this efficiency improvement on gas consumption for power generation. It indicates that the improved efficiency reduced gas consumption by about 1,000 trillion Btu or 1 trillion cubic feet in 2004. That said, there are some states, such as Louisiana, in which utility regulations are allowing incumbent utilities to continue to use older, less efficient plants while new, more efficient plants sit idle or underutilized. Remedying this situation is one way to rapidly reduce the amount of gas consumed for power generation.

The question raised in this hearing is whether or how much clean air regulation has led to the increased use and construction of gas-fired power plants. In fact, air regulation is only one of many drivers for the use of gas and probably not the most important one.

Figure 2 – Increase in Natural Gas Power Plant Efficiency



Our environmental regulations do not single out individual fuels for priority treatment. The most significant differentiation between fuels historically has been to set less stringent limits for coal plants than for gas plants. While there is no question that gas-fired plants are cleaner than coal-fired plants, our environmental regulations require more aggressive reductions for cleaner plants such that the cost per ton of NO_x control for new natural gas plants, for example, can be higher than the equivalent cost for new coal plants. In addition, many of the recent environmental programs have been cap and trade programs, which provide great compliance flexibility and are designed to avoid forcing the shutdown of older, high emitting plants. If anything, these programs have undervalued the efficiency and low emissions benefits of gas-fired plants by providing them with fewer trading allowances than provided to coal plants with the same electric output. So gas plants are not getting preferable treatment on emission regulation. And despite their low emissions, natural gas power plants have faced substantial opposition from local communities and activists in many parts of the country.

Some of the reasons other than environmental regulation for the increased construction of gas-fired plants are that the gas plants:

- Have a much lower capital cost – about half that of coal plants. This was especially important for the non-utility developers who built most of the plants in recent years.
- Require less land – key for construction in many areas near urban centers with attractive electricity markets.

- Do not require access to rail or water links for coal delivery – another advantage for flexibility of siting.
- Take less time to build – a key advantage during the very competitive building boom of the last five years.
- Can respond more quickly to changes in load.
- Require less water – a vital issue in many areas.

The recent generation of power plants was planned during the late 1990s and was built by independent, competitive, non-utility power developers expecting to compete in a restructured, competitive power market. There was a premium on being the first plant into that market. Natural gas prices were below \$3/MMBtu. Combined with the low capital cost, high efficiency, short construction time and other advantages, gas plants were the obvious choice. Any plausible change in environmental regulation would have had little effect on the choice of gas technology over coal at that time.

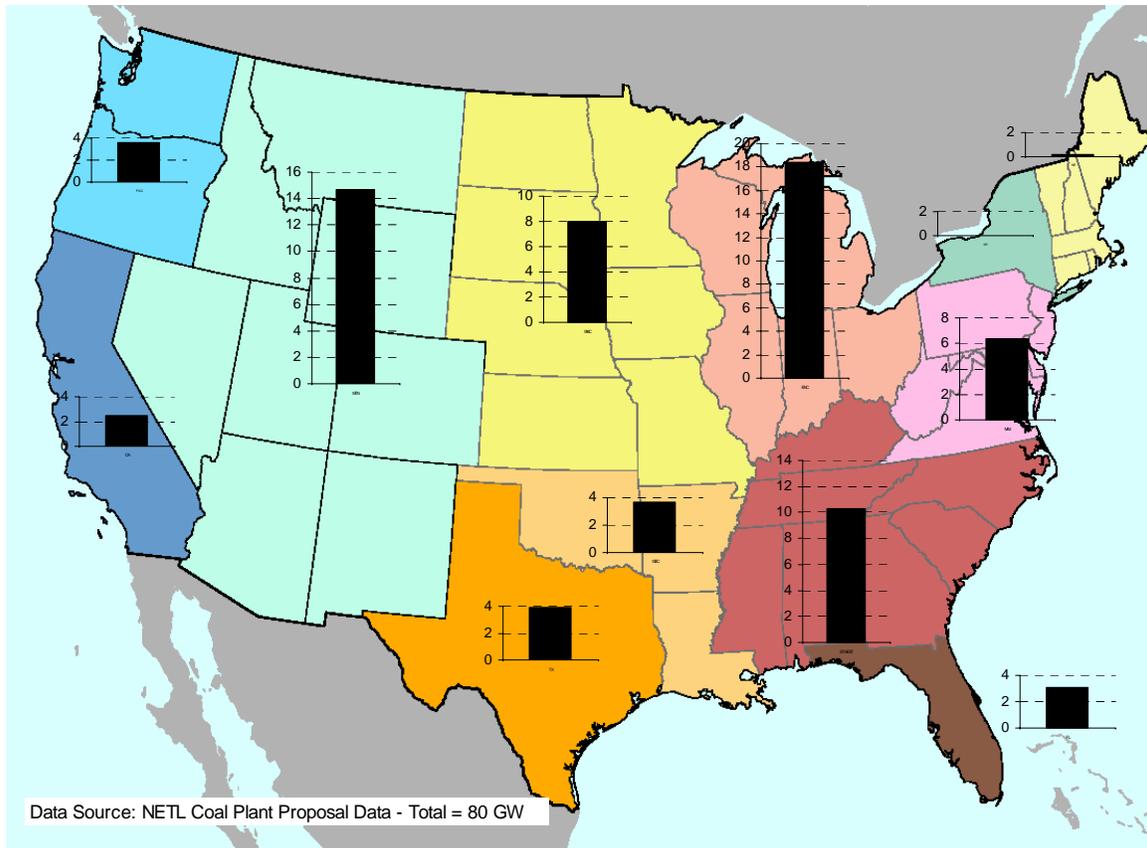
The economics of new plant construction have now changed significantly. With the current gas prices, new gas plants are not economically competitive with coal plants and many are running at very low levels of utilization or not at all. Today's higher gas prices have resulted in higher electricity prices in many regions, creating a very high value for coal-fired generation. The U.S. DOE is currently tracking about 135 planned or proposed plants comprising 80 GW of new coal generation (Figure 3). Construction is beginning on a number of new coal plants. These proposals include plants using supercritical steam, circulating fluidized bed and integrated gasification combined cycle technologies. While not all of the proposed plants will ultimately be built, these new coal plants are designed to cost-effectively meet all the current emission requirements for conventional pollutants. Admittedly, it can be difficult to site and permit a coal plant and there are many regulatory avenues that can be used to delay construction; however that is also true for gas power plants, wind farms and most types of energy infrastructure.

In discussing the construction of new coal plants, it is commonly asserted that passage of the Clear Skies Act will facilitate the construction of new coal plants by providing certainty regarding regulation of conventional pollutants. While this is true in part, it ignores that fact that uncertainty over the future regulation of CO₂ emissions is an even larger impediment for potential builders of coal plants. An increasing number of power companies are making clear that they cannot commit to large investments in new coal plants with a lifetime of 40 or 50 years without reasonable certainty on their future CO₂ regulatory liability. They are suggesting that it may not be less regulation but more regulation in the form of four pollutant regulation that could help accelerate the construction of new coal plants.

One other topic related to environmental regulation is the use of fuel-switching. Fuel-switching usually refers to switching gas-fired boilers to residual oil during periods of high gas prices, typically during peak winter heating periods. This is an important option for limiting peak natural gas prices. Many switchable boilers have regulatory limits on how much they can switch during the year. States have the option of reviewing or

modifying these limits or suspending them during periods of limited gas supply. Some states in the Northeast have prepared to do just that during this winter if necessary. Most of the new gas-fired plants do not have alternative fuel capability and requiring them to have oil-back capability is another common suggestion to address prices. Given current oil prices, switching to oil is not very attractive economically except during periods of unusually high gas prices.

Figure 3 – Proposed New Coal Power Plants - 2006



While short-term fuel-switching to oil during peak price periods is an important mechanism to relieve demand and limit prices for a short period of time, it does not create significant downward pressure on overall gas prices. That would require long-term switching or conversion of gas-fired plants to oil or coal. While conversion to oil is the more technically feasible option, it could create a significant increase in our oil consumption. For the newer gas plants, this would be distillate oil, which competes with diesel fuel, heating oil and jet fuel. Stimulating a large increase in oil consumption does not seem to be consistent with our current energy policy goals. That brings us back to increased use of coal, which I've addressed above.

In short, environmental regulation has not been the primary reason for the recent growth in gas generation. Going forward, environmental regulation can best encourage increased

coal use if it addresses regulation of CO₂ as well as conventional pollutants. That said, any responses related to new power plant construction are mid- to long-term responses. Given the complexities and importance of the natural gas supply/demand issues, we should focus our attention on near-term supply and efficiency responses that can provide benefits in the shorter term.