



Natural Gas & Climate Change Forum

**October 4, 2007
Ronald Reagan Building
Washington, D.C.**

Executive Summary

Natural gas is seen as an energy solution of choice when green house gas regulations are imposed, but the increased use of natural gas has ramifications that must be considered by policy makers. There is no single energy solution that can meet the carbon reduction targets being debated on Capitol Hill, a portfolio of energy solutions are necessary. Energy efficiency will play a critical role in meeting energy demand while preserving economic growth and addressing environmental goals. Regulatory barriers to maximizing total energy efficiency can be overcome by aligning utility incentives with cost-effective measures.

Perfecting carbon-capture technology is a high priority of the electric industry, though opinions differ as to how quickly this technology can be proven to work. It appears unlikely that large numbers of new nuclear plants will come online until after 2020; public opposition is expected to be a major barrier. Because of these uncertainties, natural gas is the primary near-term solution to meeting electricity demand in a carbon-constrained economy.

Comprehensive federal greenhouse gas legislation appears unlikely until 2009. Some view a cap and trade framework as having an advantage over a carbon tax as a means of lowering emissions because it is more likely to spur innovation. In such a scheme, a large fraction of allowances could be allocated to natural gas and electric utilities. Generators would buy them from utilities, and the revenue raised could finance larger demand-side management programs or pass back to consumers.

Because methane is 23 times more potent than carbon dioxide as a greenhouse gas, efforts to cut methane losses will pay big dividends. There has been a shift from federal to private-sector funding for natural gas research. Near-term research is focusing on gas-equipment efficiency. Longer-term research is being done by research centers set up by leading universities, which are finding that research funds for energy and the environment are becoming increasingly available.

Introduction

On October 4, 2007, the American Gas Foundation (AGF) sponsored the *Natural Gas and Climate Change Forum*. Co-sponsors were the Alliance to Save Energy and the Environmental Protection Agency's (EPA) Natural Gas STAR program. The all-day event was held at the Ronald Reagan Building in Washington, D.C.

The forum featured welcoming remarks by Ronald J. Barone, managing director of UBS Investment Research and an AGF trustee; a keynote address by Christopher Flavin, president of Worldwatch Institute; and remarks by EPA Administrator Stephen L. Johnson.

Representatives from federal government agencies, natural gas distribution companies, a natural gas research organization, environmental and conservation organizations, and academia participated in three panel discussions covering the role of natural gas in efforts to address global climate change. This paper summarizes the issues discussed in the course the program.

Natural Gas and Climate Change

There will be no single solution to meeting regulations imposed to combat global warming, with most industries and the power sector opting for a portfolio of solutions, Barone said in his opening remarks, but natural gas will be a major beneficiary of carbon-reduction rules. The electric industry will need to construct substantially more gas-fired generation, in part to handle ongoing load growth but also to back up renewable sources, he noted.

In the near- to medium-term, Barone said, these additions to gas-fired capacity will be insufficient, leading to a tightening of reserve margins and rising capacity for existing combined-cycle plants as well as greater use of less-efficient gas turbines. Greenhouse gas mitigation will impose a real cost on consumers, Barone said, with prices for natural gas and electricity outpacing overall inflation for several years. This, in turn, will affect both the competitiveness of U.S. businesses and consumer spending patterns.

Nuclear energy will not be a magic bullet for climate change, Barone said, because of numerous challenges that will confront any attempt to restart the nuclear industry. UBS does not expect any new nuclear plants to be built before 2017, Barone said, and there will be no new wave of nuclear plants until after 2020.

Barone also expressed skepticism about how soon carbon-capture technology would make increased burning of coal feasible under greenhouse gas regulations, calling attention to a recent announcement by Tampa Electric that it was shelving plans for an integrated gasification combined-cycle plant because of uncertainty surrounding carbon capture and sequestration regulations.

In his keynote address, Flavin declared there will be no going back to the nation's former "lackadaisical" approach to climate change, though there is still an under appreciation of the threat. While there is as yet no federal legislation to limit greenhouse gas emissions, "its clear there is an implicit price for carbon" that is affecting investment, Flavin said. He added, "We already have an energy revolution under way."

Flavin stated, "Natural gas will be the big winner in a carbon-constrained world." He said he disagreed with the notion that the world is running out of natural gas, stating, "There's a potential for significant growth in gas production." The most important future role for gas will be its use in a decentralized way, such as to power microgenerators and fuel cells, Flavin said, although he noted that in some cases regulatory structures currently restrict such decentralized use. He also noted the importance of focusing new attention on the benefits of natural gas vehicles.

"There's a potentially bright future for natural gas if the industry understands where it is and picks the right allies," Flavin said, adding that the gas industry needs to do a better job of carving out an identity for itself that is separate from that of oil.

Energy efficiency has also received a shot in the arm from global warming concerns, Flavin said, although higher prices for natural gas and electricity have also helped. Because of state regulations, he noted, Californians use one-half as much electricity per capita as the rest of the country. He also pointed to the efforts by utilities throughout the country to change laws and regulations that provide a disincentive for companies that want to promote conservation.

EPA Administrator Stephen Johnson said that his agency and President Bush "take the challenge of climate change seriously" and noted that the United States has spent \$33 billion on climate change since 2001, more than any other nation. Johnson said a post-2012 climate change "framework" would be released by the administration before the end of the year. Johnson said greenhouse gas-reduction goals can be accomplished "without compromising economic growth or energy security," and stated that a diverse energy portfolio, including coal, will be needed in the future.

EPA has exported the voluntary Natural Gas STAR program to Japan, Taiwan, Australia and the European Union, Johnson said, and is now working with China to improve energy labeling. In the United States, he noted, 56 percent of the natural gas industry is involved in the program, and because of Natural Gas STAR, methane emissions are down 11 percent since 1990.

Impact of Proposed Climate Change Initiatives

Electric generation that relies heavily on coal is the easiest place to reduce energy-related carbon dioxide emissions because this sector has the ability to accommodate a different mix of fuels without major infrastructure change. In the near term, the need to cut carbon emissions in the power sector will benefit the natural gas industry because there is no other readily available option. But in the longer run, natural gas

cannot solve the problem alone -- a portfolio of solutions is needed. All available options have uncertainties and face barriers.

An EPA analysis of the impact the climate-change bill proposed by Sens. Joseph Lieberman (I-Conn.) and John McCain (R-Ariz.) found that electricity prices would increase by 22 percent in 2030 and 25 percent in 2050, assuming that the full cost of allowances is passed on to consumers. If allowances were given directly to power companies, the cost of the allowances would not be passed on to consumers in regulated markets and thus electricity price increases would be lower in much of the country.

A U.S. Department of Energy's Energy Information Administration (EIA) analysis of the commodity price effect of placing specific values on carbon dioxide emissions concluded that a \$10 per ton CO₂ value would translate into a 59.9 percent increase in the price of coal, a 4 percent increase in the price of oil and a 5.5 percent increase in the price of natural gas. A \$50 per ton value would increase coal by 299 percent, oil by 19.9 percent and natural gas by 27.5 percent.

Specific levels of carbon dioxide emissions in laws under consideration by Congress may not matter as much as incentivizing other countries to take action on greenhouse gas emissions. Europe has not proven to be a model for this country to follow. The United States must look at how its actions can influence other countries.

Implications of Greater Reliance on Natural Gas

While some studies have predicted a decrease in natural gas as the result of the development of clean coal technology and a resurgence in nuclear power, there was general agreement among panelists and other speakers at the forum that nuclear energy will not be a near-term solution to greenhouse gas concerns. New nuclear plants may simply replace existing plants that have shut down and not add appreciably to the nation's nuclear-generated electricity capacity. Public resistance to a full-scale nuclear renaissance could be very strong.

The electric industry has experience with siting, permitting and constructing gas-fired generation in a relatively quick turnaround. However, much greater emphasis must be placed on increasing access to gas supply. Domestically, shale and other unconventional plays will prove increasingly important. Many view liquefied natural gas to be a wild card; about three-fourths of the world's gas supply is in the Middle East and former Soviet Union.

There was disagreement over how soon carbon capture might be available as a commercially proven technology, but no dispute about the fact that the electric industry has made this a high priority for research. The pipeline industry sees carbon transportation as an opportunity. With the Federal Energy Regulatory Commission, not the individual states, having the lead role, the process for building interstate pipelines is relatively streamlined and far easier than that for high-voltage electric transmission lines.

Some view a cap-and-trade framework as having an advantage over a carbon tax as a means of lowering emissions because it is more likely to spur innovation. There could also be thorny issues involving who gets taxed. Allowances under a cap-and-trade regime would be worth a great deal of money, and thought needs to be given as to how they should be allocated. One possibility is to allocate a large fraction of them to natural gas and electric utilities. Generators would buy them from utilities and the revenue raised could finance larger demand-side management programs and be passed back to consumers. Environmentalists and the energy industry can reach common ground on the importance of energy efficiency.

Technologies for the Future

Methane is 23 times more potent a greenhouse gas than carbon dioxide, so reducing methane emissions can have a more immediate effect on global warming than cutting CO₂. Methane that escapes into the atmosphere also represents a lost energy source and lost revenues for the industry. Efforts to increase the efficiency of natural gas delivery can thus pay big dividends.

There has been a shift from federal to private-sector funding for natural gas research. Current research by the Gas Technology Institute includes such projects as the Super Boiler – a 94 percent efficient industrial boiler – and improved metering for the glass industry. Projects to convert biogas to diesel and develop hydrogen-fueling technology are attracting funding. The natural gas industry has formed the Utilization Technology Development Co. to fund efficiency improvements in gas equipment. Among its goals is the development of improved natural gas appliances; improvements in the efficiency of electric appliances make this a particularly important undertaking for the gas industry.

Energy has reemerged as a long-term research priority for academic institutions, with funds increasingly available. Key research centers are the Lenfest Center for Sustainable Energy at Columbia University, the MIT Research Initiative, the Stanford Global Climate and Energy Project, and the Berkeley Institute of the Environment. Carbon management, which involves separation, transportation and sequestration, is receiving increasing attention. The key sequestration methods are terrestrial sequestration, ocean sequestration, mineral sequestration and air capture. No single method will work everywhere in the world. Mineral sequestration is a particularly promising area because a value-added product can be made in conjunction with carbon storage.

Forum Speakers & Panelists

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The Honorable Stephen L. Johnson

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American Gas Foundation (AGF) – Founded in 1989, the American Gas Foundation is a 501(c)(3) organization that focuses on being an independent source of information research and programs on energy and environmental issues that affect public policy, with a particular emphasis on natural gas. The AGF has developed several recent public policy reports, such as *R&D in Natural Gas Transmission and Distribution*, *The Energy Policy Act of 2005 and Its Impact on the U.S. Natural Gas Supply/Demand Imbalance*, and *Public Policy and Real Energy Efficiency*. www.gasfoundation.org