

Unlocking the Potential of Domestic Gas Resources: Making the Unconventional Conventional

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CSIS B1 Conference Room

Event Summary

Addressing the global challenges of climate change and energy security is a continuing effort for U.S. policy makers and the new Administration. At this event hosted by the CSIS Energy and National Security Program, a panel of experts discussed the extensive domestic natural gas resource in the form of unconventional gas (shale gas, tight gas, and coalbed methane) as well as the major technical, environmental, and commercial challenges to bring it to market.

Unconventional gas is contributing in significant ways to outlooks for natural gas in the North American market. It is, in fact, already an important component of supply comprising nearly half of present U.S. domestic gas production, which calls into the question the validity of its unconventional label.

Donald Paul, Senior Advisor to the Energy and National Security Program at CSIS began the session, stating “One of the challenges in any discussion about energy is that it is never one thing. It always involves business and economics, technology, government, policy and environment.” Traditionally, gas has been a regional development. Technology and investments, Mr. Paul stated, are now globalizing gas in the form of liquefied natural gas (LNG) and unlocking new resources like unconventional gas. Viewpoints of what resources can contribute to the energy mix have changed dramatically. Mr. Paul noted several important challenges that will have an important role in determining the extent of future development, particularly for unconventional gas: these include land use management, regulatory issues, and prices and other commercial issues.

Brenda Pierce, Program Coordinator, Energy Resources Program, for the U.S. Geological Survey, addressed the extensive resource base for unconventional gas. Ms. Pierce stated that the world currently has an estimated 5,500 trillion cubic feet of undiscovered technically recoverable natural gas resources and that these have the potential to become reserves. Coalbed methane, one form of unconventional gas, has been well developed in many parts of the U.S., already contributing 10 percent of gas supply and growing. Although a large contributor, the set of

resources with the greatest potential are those associated with shale formations – known as shale gas. Ms. Pierce referred to the Barnett shale in Texas as a window into the potential future of shale gas development and the effect the new application of technologies. She showed the rapid increase in horizontal drilling in the Barnett since 2003 and a corresponding acceleration of production in the formation. Ms. Pierce was clear, however, that all shale formations are unique and will require site-specific geologic understanding and application of technology. Ms. Pierce briefly touched on methane hydrates, an enormous gas resource trapped at high pressure, often located below the sea floor. Timing and availability of these resources, she stated, would be heavily dependent on the advancement of technology and commercially viable production methods.

Ron Hyden, Strategic Business Manager, Production Enhancement, Halliburton, discussed the critical role of engineering and technology in producing shale gas. Mr. Hyden agreed with Ms. Pierce that “no two shales are alike” and noted that many technologies, such as hydraulic fracturing and horizontal drilling, have been available for some time but have been applied more effectively with better understanding of the physical characteristics of the resource base. Currently, the industry focus is on developing technologies to address some of the environmental challenges associated with shale production, particularly more efficient use of water during hydraulic fracturing.

Julie Struble, Vice President of Operations for Anadarko Petroleum Corporation, added insight from the industry perspective. Ms. Struble gave a brief overview of the commercial decision process and factors evaluated by independent companies when investing in shale gas plays. The risks can be large. Production of shale gas often requires investments of several hundred million dollars, even before a company makes a decision to pursue full development. First, said Ms. Struble, a company will look at the potential “size of the prize” and decide whether or not to invest capital to acquire land and drill a handful of test wells. The next step of the process, granting that initial pilot wells yield promising results, is to drill a series of horizontal test wells. If the resource is proven, a company will evaluate the regulatory, market, and infrastructure risks before pursuing full commercial development. Ms. Struble noted that gas prices, particularly for independents, can strongly effect shale production due to its influence on capital expenditures. Ms. Struble concluded that without continuing investments, production rates will not be maintained due to the steep decline rates (60% within the first year) of shale gas wells.