

**IMPACT OF WORLDWIDE SHIFT TO GREATER RELIANCE ON
NATURAL GAS ANALYZED**

Rice and Stanford universities study geopolitical importance of natural gas

HOUSTON — (May 27, 2004) — An integrated global natural gas market is emerging from today's regionally isolated markets, and it will impact both large gas consumers and producers, according to a two-year study by Rice and Stanford universities. The findings were presented at a conference on the geopolitics of natural gas at Rice University's Baker Institute for Public Policy May 26-27.

Global consumption of natural gas is projected to more than double by 2030, and natural gas is likely to surpass coal as the world's No. 2 energy source.

About three-fourths of the world's proven gas reserves are in the former Soviet Union and the Middle East, but the demand for gas is expected to rise most rapidly in North America and Europe, with new markets developing in China, South Asia and Latin America. Investment in liquefied natural gas (LNG) facilities is expected to double after 2020.

Results from the study's economic modeling suggest that the shift to a global market will make each major consuming or producing region vulnerable to events in any region. For example, disruptions in supply or demand will ripple through such an interdependent world market, and prices and project development in any region will be affected by new major gas export projects coming online.

A series of developments is spurring the integration of natural gas markets, including an increasing demand, technological advances, market liberalization, and cost reductions in producing and delivering LNG to markets.

The Energy Forum at Rice's Baker Institute and the Program on Energy and Sustainable Development at Stanford University reviewed seven historical case studies on the special challenges of investing in large-scale, long-distance gas production and transportation infrastructures in Algeria, Russia, Turkmenistan, Indonesia, Trinidad and Tobago, the southern cone of Latin America and Qatar. Scholars at Rice also developed the Rice World Gas Trade Model, which simulates the development of global gas markets between 2005 and 2030 based solely on commercial considerations of available supply and its development costs, transportation costs, the cost of capital, end-use demand and inter-fuel competition.

The model suggests that Russia will play a pivotal role in price formation in the new integrated global natural gas market, due to the nation's location and sizeable resources and its status as one of the first major gas exporters to the European market. Eastern Siberian gas is expected to flow to Northern China by the middle of the next decade. The presence of low-cost Russian pipeline gas in both Asia and Europe will link Asian and European gas prices. The model also suggests that Russia will eventually enter the LNG trade via the Barents Sea, providing an additional link between gas prices in North America, Europe and Asia.

Although other resource-rich nations like Iran and Saudi Arabia could become major players, the study suggests they are at a disadvantage because they have to bear the fixed costs of market entry since they lack an existing infrastructure to carry their gas to the European and Asian markets. The study predicts that neither Middle East resource powerhouse will become a major gas player in the next two decades. Their entry will be delayed until demand rises enough to accommodate incremental supplies.

The United States is expected to remain a premium region as North American production fails to keep pace with demand. High prices will continue to pull gas supplies from around the world.

The international gas industry is already responding to the integration of supplies and major gas-consuming regions. Expectations about the future market evolution are influencing investment and trading decisions, and this, in turn, is accelerating the change in market structure. More international oil companies are investing in major natural gas infrastructure projects without the security of fully finalized sales for total output volumes.

The Rice and Stanford researchers found that as market liberalization takes hold in many major gas-consuming countries and the global trading of

natural gas expands, the role of government is changing – away from the traditional builder, operator and financier of gas projects toward a greater role as regulator and creator of the context for private investment. In the emerging commercially driven environment, the role of courts as enforcers has grown. Legal reforms have given courts and quasi-judicial bodies, such as regulators, greater authority.

Questions about national security of supply have risen as the highly structured gas world of government-back bilateral, fixed-priced contracts has shifted to a new world of private, market-related contracts. Concern for maintaining a secure supply of reasonably priced natural gas will be viewed more and more as a vital national interest, due to the potential formation of a gas cartel similar to OPEC. The study found that the Gas Exporting Countries Forum has too many members with diverging interests to exert effective constraints on capacity-expansion projects in the near term. “It is likely to be a decade or more before they can assert sustained monopoly power in world gas markets, leaving consumer countries ample time and opportunity to adopt countermeasures,” the study reported.

The study cautions that the rapid shift to a global gas market is not a certainty. “It depends enormously on creating the context in which investors will have confidence to deploy vast sums of financial and intellectual capital; it requires finding solutions to the adverse social and political consequences of developing natural resources in countries where governance is weak; and it assumes a continued pull from the growing world electricity sector.”

The complete study is available online at <http://www.rice.edu/energy/gasevent/> and <http://pesd.stanford.edu>.

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