

NATURAL GAS TRADE AND ENERGY SECURITY IN THE ASIA PACIFIC

Overview

Rapid economic growth in Asia is leading to rapidly growing energy demand. At the same time, increasing concerns about air pollution are making natural gas a more attractive fuel. Currently, countries in Northeast Asia are the largest importers of LNG in the world, with most of the supply coming from Australia, Southeast Asia and Qatar. Some countries in Northeast Asia could also import substantial quantities of natural gas via pipelines from a range of potential suppliers. The Indian sub-continent will also become an increasingly important customer for natural gas in coming decades. India and Pakistan also have options to import via pipeline, especially from the Middle East, as well as via LNG from several sources. In this paper, we examine the likely evolution of the market for natural gas in Asia in a global context taking account of geological and economic factors alone. We will then discuss some of the geopolitical implications of that projected path of development, and ask what some of the implications may be of allowing political considerations to over-ride the reference case development path.

Methods

We use a dynamic spatial market equilibrium model (the Rice World Gas Trade Model) to analyze how natural gas exports are likely to impact the gas markets of Asia within the context of the worldwide market for natural gas. The model balances supply and demand at each location in each period such that all spatial and temporal arbitrage opportunities are eliminated. More specifically, it proves and develops reserves from potential resources determined using geologic data, constructs pipeline and LNG delivery infrastructure, and calculates prices to equate demands and supplies while maximizing the present value of producer rents within a competitive framework. In particular, the model allows an examination of the economic rents associated with any project development. Outcomes in the Reference Case, to which the other scenarios are compared, are mainly driven by economic, geologic and geographic factors. We then examine several scenarios where we allow political considerations to over-ride the reference case outcomes and look at the implications of those over-rides for natural gas prices and trade in Asia.

Results

Thus far, we have preliminary results from a version of the model, which will be updated over the coming months to reflect more recent data (and accompanying new parameter estimates) that we are now entering into the model. Our Reference Case indicates increasing interconnectedness in the global gas market. This is largely due to expansion of LNG trade, which facilitates arbitrage between regions by providing a high degree of destination flexibility. Our preliminary results also imply a dramatic effect on world natural gas markets from the development of unconventional supplies in North America in particular but also elsewhere in the world. Of particular relevance to Asia, unconventional supplies from Australia – coal bed methane in the short run, but also shale gas in the longer term – also assist that country in providing LNG supplies to Northeast Asia in particular.

Conclusions

The preliminary results indicate that the Middle East will become a critical “swing supplier” of LNG to both Europe and Asia, while Russia will also become a large supplier of pipeline gas to both continents. Unconventional gas will also play a critical role in lessening the dependence of the world natural gas markets on a small number of large suppliers. This in turn will have important energy security implications not only for the Asia-Pacific but also for the world as a whole.

References

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