

# The Role of Natural Gas in the Asia-Pacific Energy Future

## *An interview with Mikkal Herberg*

By Graham Webster

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*Natural gas is playing an increasingly important role in providing cleaner energy for Asia-Pacific countries, but bringing the energy market into the future is a challenging task. In advance of the 2011 [Pacific Energy Summit](#), held in Jakarta with the theme of “Unlocking the Potential of Natural Gas in the Asia-Pacific,” we asked Mikkal Herberg, NBR’s research director for Asian energy security, to explain the importance of natural gas in Asia and the challenges facing policymakers and energy resource developers. Mr. Herberg is also a senior lecturer on international and Asian energy in the Graduate School of International Relations and Pacific Studies at the University of California, San Diego.*

**Graham Webster: There are many issues the Pacific Energy Summit could focus on in the Asia-Pacific region. Why natural gas, and why now?**

Mikkal Herberg: I think there has been an important change in the global and regional natural gas picture that makes natural gas a useful tool to enhance energy security everywhere, but particularly in the Asia-Pacific. Natural gas also offers environmental benefits by potentially reducing carbon emissions and air pollution. It should thus be seen as a bridge fuel—a cleaner, lower carbon, inexpensive, and available fuel source with the potential to help countries achieve both energy security and environmental goals.

On top of that, we have an extremely robust new global supply picture for natural gas. The stars just seem to have aligned for it to be an important fuel, specifically for Asia.

**Many of the experts attending the Summit prepared papers about specific types of gas development. What are the major types of natural gas, and what makes their development different?**

Natural gas itself is a fairly homogenous resource. Consisting primarily of methane gas, it generally comes from high-pressure, high-temperature reservoirs—much higher pressure and higher temperature than would be typical for oil reservoirs. There are three categories of natural gas. First, there is what we call “conventional gas.” For the last hundred years we’ve been producing natural gas out of the ground in bulk quantities for energy generation and industrial and household uses.

Second, there is a lot of what’s being called “unconventional gas,” which is adding to the global supply capacity. One kind is shale gas. With the development of technologies that can access natural gas from very non-porous hard shale rock formations—supplies that previously were not commercially viable to produce—shale gas has become a significant new fuel source in recent years. There are also growing

supplies of unconventional gas coming from coal beds around the world that contain methane, called coal bed methane (CBM).

Third, another part of the gas value chain that is key to Asia is “liquefied natural gas” (LNG), which can be transported long distances in large quantities at a cheaper cost than by pipeline. LNG is generated by freezing natural gas down to 260 degrees below zero, where it becomes a liquid and condenses into a much smaller volume. This liquid is transported around the world on special LNG tankers, and warmed up and re-gasified upon reaching the market it is serving.

The advantage of LNG is that it can be shipped over long distances for which building pipelines—particularly expensive undersea pipelines—is simply not economical. LNG makes it possible to move gas economically over long distances by sea lanes.

**Part of the economic challenge to increasing natural gas use in the Asia-Pacific is a pricing structure that allows more developed countries like Japan and South Korea to buy LNG from international sources, but prices out the developing economies of China and India. How did this come to be?**

Think of the natural gas economy as comprising three regional markets worldwide. One is the United States and North America, where gas moves by pipeline. The United States is a continental market, very densely pipelined, and built on a free-market gas pricing system. This is the most competitive, flexible, and inexpensive market in the world, owing to big supplies of gas in North America.

In Asia and Europe, for the most part, pricing of LNG and pipeline natural gas tends to be linked to oil prices. When Japan basically created the LNG business in the 1960s and 1970s by undertaking LNG projects in Indonesia and Malaysia, pricing was based on what’s called the Japan Crude Cocktail (JCC) in which LNG is price-linked to crude oil prices in a set of fairly complicated, individually negotiated formulas.

For Asia this is critical because Japan, Korea, and Taiwan—the traditional LNG buyers in Asia—were sufficiently well-off to pay these high LNG prices for the consistent supply and energy security benefits. But for China, India, and other countries that have tried to keep natural gas prices low to subsidize their industry and their consumers, LNG has not been very competitive or attractive because these countries want to keep gas prices so low that LNG just can’t compete. But this is changing.

**What are some of the opportunities or approaches we might see for addressing this pricing dilemma?**

First, policymakers in developing Asia need to become more realistic about the price they will pay for gas and LNG in the future. Second, I think the developers—the companies that are building these big LNG projects—are working to find ways to make pricing systems and contract arrangements more flexible and demand-friendly. Somewhere, these two sides have to meet in the middle, and this is happening.

With the supply of natural gas increasing, developers, under pressure to find viable markets, are working with governments to design pricing and contract terms that are appropriate for these developing markets.

For policymakers, the large supply that's coming on from conventional gas, LNG, and other sources can give some comfort that gas supplies will be ample, reasonably priced, and reliable, and that countries can count on pipeline gas and LNG to become an important base fuel for their economy.

Artificially low gas prices discourage investment in new supply and needed infrastructure to transport gas. Higher prices can attract LNG supplies that will be able to compete with lower-priced domestic supplies. What is needed are prices that are high enough so that demand doesn't grow so rapidly that supplies can't keep up. A key to this across the region is realistic electricity prices that allow providers to pay for natural gas to generate electricity. When electricity prices are too low, generators will argue, "We can't afford to pay for natural gas. We have to use coal"—cheap, available, but very dirty coal—"because that's the only option that makes economic sense for these low electricity prices we get."

**Natural gas trade, pipelines, and exploration are international, geopolitically complex phenomena. What role is natural gas playing in geopolitics, and what role is geopolitics playing in natural gas production?**

There are very large natural gas supplies scattered around the Eurasian continent that could be available, particularly for China and Northeast Asia. You have huge LNG supplies being produced now from the Russian island of Sakhalin, north of Japan, and exported to Asia. But there are also very important supplies in the Irkutsk region of East Siberia, in western Kazakhstan around the Caspian, and in Turkmenistan, which is the third-largest reserve holder, I believe, in the world. Uzbekistan has sizeable gas supplies that have yet to be linked up to East Asia. And then there are sizeable gas supplies offshore in Myanmar.

The interesting thing is that the most economical gas supply to move to East Asia is in East Siberia. That has been held up by a whole series of problems that mainly have to do with Russia's unclear policies about the investments necessary to develop those gas fields, in particular with China. Russia has taken greater central control over its oil and gas resources, and China has not until recently been willing to offer gas prices that Russia thinks make sense—prices that are competitive with what Russia gets from Europe.

The irony is that the most economical source isn't moving to China and Northeast Asia when it should. China ultimately has decided to turn to Central Asia and elsewhere for new pipeline gas supplies. A large Turkmenistan-China pipeline started transporting gas about a year ago. Ultimately that gas is pretty expensive to move all the way from Turkmenistan to the east coast of China, but Beijing has been willing to subsidize pipeline development in the interest of energy security. The Turkmenistan-China pipeline will then be linked with a parallel pipeline from Kazakhstan that's being negotiated as we speak.

There is also the case of Myanmar. India wanted to get Myanmar's offshore gas moving to India, and China wanted to import it to south China. India couldn't put together an investment proposal quickly enough, whereas China could and has a very strong strategic relationship with Myanmar. Thus, the pipeline is now being built to south China.

**East Asia watchers will remember an ongoing dispute between Japan and China about an offshore gas field. Is this resource strategically important from an energy perspective?**

The gas field that Japan and China are having a shoving match over is not very big, and that's why the dispute is puzzling. Chinese development of the field made some economic sense because China is trying to move more offshore gas into its system, but the field is not very large. From the Japanese perspective, the field is too far away from the Japanese mainland and the ocean is too deep as you move toward Japan from that gas field to build a gas pipeline. The supplies are also too small to justify turning the gas into LNG. So this conflict is really driven more by Chinese-Japanese rivalry and sovereignty issues than by energy insecurity.

### **What will the Pacific Energy Summit accomplish?**

First, this Summit aims to strengthen the confidence of the governments in the region, particularly the developing governments in China and India and in Southeast Asia, that natural gas can be a major base-load fuel for their economic development and energy security. To become a base-load fuel, natural gas must be used in power generation. Countries with rapidly growing electricity demand need confidence that there is a sufficient supply of their base-load fuel and that it will be reasonably priced.

Second, the Summit can give industry more confidence that these governments “get it”—that countries are beginning to understand that price reform is important, that electricity prices need to reflect the prices of the fuels that go into electricity, and that natural gas prices must be sufficient to generate investment in new gas supplies, pipeline infrastructure, and LNG facilities and infrastructure.

The third very important message of the Summit is the importance of gas in slowing the growth of coal use in Asia. China and India alone are expected to account for 80% of the entire global increase in coal consumption over the next 25 years, with 80% of that coal being used to generate electricity. China's coal consumption could double in the next 20 to 30 years, and the environmental and CO<sub>2</sub> consequences of that are deeply problematic.

Natural gas can be a bridge to slow this coal consumption curve in Asia. For the next 20 years, solar, wind, hydroelectric, and nuclear power cannot take up the slack of electricity demand growth. We need something in the interim, and that something can be natural gas.

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