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## **Gas in Asia: From Regional Premium to Global Commodity?**

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## EXECUTIVE SUMMARY

This paper assesses the progress that the global gas market has been making in realizing the potential for gas to increase its share of the worldwide energy mix and, in particular, the role that the gas markets of Asia have been playing, and may play in the future, toward reaching this potential.

### *Main Argument*

In its 2011 special report entitled “Are We Entering a Golden Age of Gas?” the International Energy Agency anticipated that the Asian gas markets would generate nearly half of the c. 60% growth in global demand projected for the 2008–35 period. The subsequent development of those gas markets therefore provides an important signpost as to whether the global gas market is on the road to fulfilling its potential. With the exception of China, the picture has been mixed, with demand growth that would have been even patchier in the absence of the boost to LNG demand generated by the Fukushima Daiichi tragedy in Japan in 2011. A regional pricing dynamic notable for the existence until recently of the “Asian premium,” has been at least in part responsible for this, and a move toward gas becoming a “normal” commodity market, with pricing that reflects industry fundamentals, will be an important contributor to future market development. There have been some positive signs in this respect.

### *Policy Implications*

- The development of gas-on-gas competition, delivering clear price signals to both demand and supply sides, provides the best opportunity for gas to realize its market potential.
- This would enable gas to price itself into market, especially the key power-generation sector, delivering important environmental benefits in the process.
- With its strong long-term interest in ensuring cost-competitive energy supply and securing environmental improvements, China may lead the way in pursuing these policy goals.

When the International Energy Agency (IEA) published its special report entitled “Are We Entering a Golden Age of Gas?” in 2011, it anticipated that the gas markets of Asia would make major contributions to the expected overall growth of global gas demand. Indeed, the IEA suggested that by increasing from a figure of 511 billion cubic meters (bcm) of natural gas in 2008 to 1,475 bcm in 2035 Asian gas markets would generate nearly half of the 60% projected growth in global demand.<sup>1</sup> The development of the gas markets of Asia in the intervening years therefore provides an important indicator of whether the global gas market is on track to realize the potential identified by the IEA. The aim of this paper is to review that progress and to assess the role that Asian gas markets are playing, and may play in the future, in this respect.

One notable feature of the gas markets of Asia, especially when compared with the markets of North America and Europe, is the almost total absence of competition as a market organizing principle at the wholesale and retail levels. In the corresponding absence of market forces as a price-setting mechanism, prices in the various Asian markets have been set by authorities as a function of a broad variety of political and social drivers, resulting in a real smorgasbord of price levels and structures across the region. That same lack of competition, however, and the corresponding lack of pressure on importers with de facto monopoly franchises in their domestic markets has translated into a remarkable homogeneity in the terms on which the international trade in gas has been conducted, with an overwhelming proportion of the volumes supplied mainly in the form of liquefied natural gas (LNG) but also by pipeline, priced in relation to the price of oil.

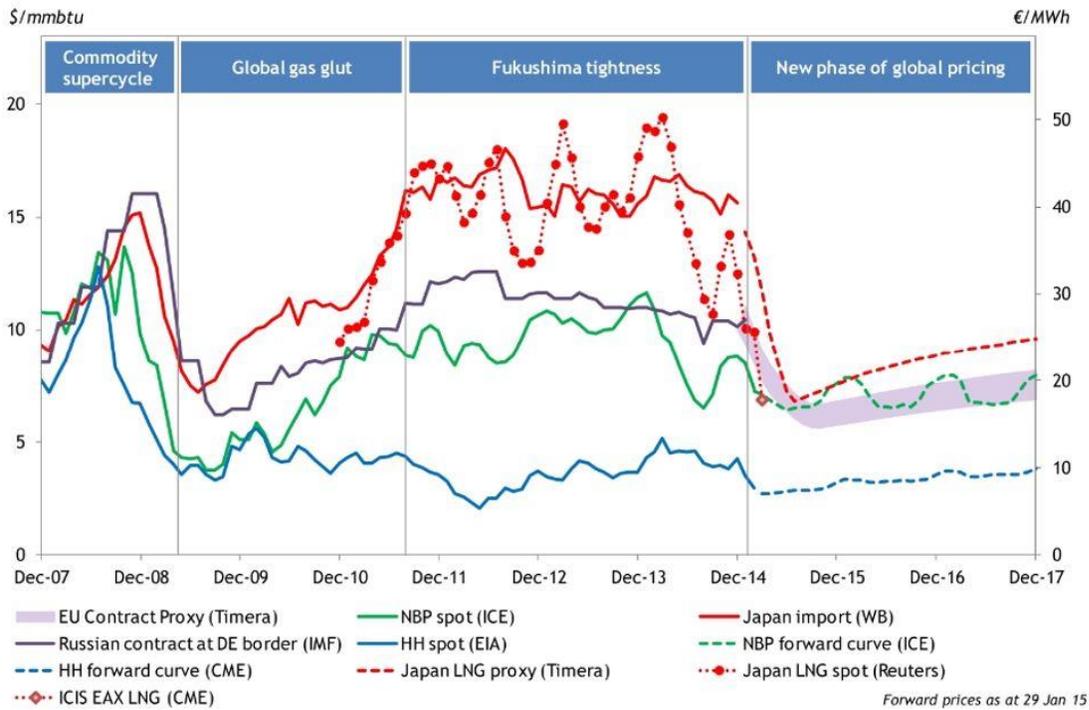
This pricing dynamic has seen the cost of gas imported into the different national markets increase inexorably as the price of oil rose from around \$20 at the turn of the century to what was widely considered to be a new, sustainable level in excess of \$100 from 2010 and 2011 onward. One notable side effect of this increase was the emergence of what became known as the “Asian premium,” namely the higher prices at which gas was being imported into the markets of Asia when compared with the price levels prevailing in the markets of North America and Europe. In particular, this premium became increasingly pronounced as a result of the shale gas revolution in North America and its knock-on effects in Europe, where the displacement from 2008 onward of new supplies of LNG originally intended for the U.S. market effectively

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<sup>1</sup> For this purpose the Asian gas market is defined, using the IEA’s classification, as incorporating the markets of non-OECD Asia and OECD Pacific.

triggered a disconnect between the prices generated by the traded markets and the oil-indexed prices that had until then predominated in the long-term contracts that accounted for the great majority of the gas being supplied into continental Europe. These developments gave rise to a situation, as illustrated by **Figure 1**, where prices for gas delivered into Asia from 2010 to 2014 were consistently at a 50%–100% premium to European prices, not to mention a multiple of four to five times the wholesale price of gas in North America. These prices hold obvious implications for the competitiveness of gas as an economic input.

**Figure 1** Comparison of Regional Gas Prices



Source: Timera Energy, <http://www.timera-energy.com/content/uploads/2015/02/Global-Gas-Prices-Feb15.jpg>.

Things had already started to change prior to the recent slump in the price of oil, with general dissatisfaction at the size of the Asian premium, exacerbated by the increase in demand for LNG following the Fukushima Daiichi tragedy in Japan. This resulted in a new focus by buyers, strongly encouraged by national authorities, on seeking better pricing conditions for their supplies. This paper will review the changes that have been taking place, particularly in the global LNG market, and discuss whether they have started a process that will in time lead to a different pricing dynamic for the gas supplied to the markets of Asia, including what this might

mean for the Asian premium. In so doing, we will also consider the market transition that has taken place in Europe over recent years, and whether this provides any indicators of the direction that gas markets in Asia may take in the coming years.

### Global Gas Demand: Have We Entered the “Golden Age of Gas”?

The IEA special report “Are We Entering a Golden Age of Gas?” suggested, amongst other things, that global gas demand would increase its share of the global energy mix from 21% to 25% between 2008 and 2035 and overtake the share of coal by 2030.<sup>2</sup> While anticipating that gas demand would expand in all regions, the IEA expected nearly 80% of the overall increase to derive from countries that are not members of the Organisation for Economic Co-operation and Development (OECD), with, in particular, China’s demand rising from the level of Germany’s in 2008 to match that of the entire European Union by 2035. So have events in the meantime proven the IEA correct? The answer is mixed, as **Table 1** illustrates:

**Table 1** *Global Gas Demand 2010–13 (bcma)*

	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	% change 2010–13
North America	850	871	903	924	+8.7%
European Union	502	451	444	438	-12.8%
Russia	414	425	416	414	0.0%
Asia-Pacific	562	594	627	639	+13.7%
- China	111	134	149	164	+47.8%
- India	63	61	59	51	-19.0%
- Japan	95	106	117	117	+23.2%
- South Korea	43	46	50	53	+23.3%
Other	853	892	921	933	+9.4%
<i>Total World</i>	<i>3,181</i>	<i>3,233</i>	<i>3,311</i>	<i>3,348</i>	<i>+5.3%</i>

Source: BP Statistical Review of World Energy 2014.

<sup>2</sup> International Energy Agency, “World Energy Outlook 2011: Are We Entering a Golden Age of Gas?” Special Report, 2011, [http://www.worldenergyoutlook.org/media/weowebbsite/2011/WEO2011\\_GoldenAgeofGasReport.pdf](http://www.worldenergyoutlook.org/media/weowebbsite/2011/WEO2011_GoldenAgeofGasReport.pdf).

What this table shows is that overall global gas demand has grown at a fairly sedate rate of c.1.3% pa over the four years in question, but that this rate disguises significant variations between the world's major market regions.<sup>3</sup> The following sections offer brief comments in this respect.

#### *North America: Growing Gas Consumption*

The healthy growth in North American gas consumption came in response to the surge in production of unconventional gas and the weakness in the wholesale price of gas at the Henry Hub resulting from supply that essentially ran ahead of demand. A major component of this demand growth came from the power sector, where the low gas price enabled a significant displacement of coal-fired generation. Contrary to the expectations of many, however, the supply growth has continued despite the gas price weakness, reflecting the success of the exploration and production industry in continuously improving the technology and associated cost structure of shale gas production. As a result, the Henry Hub price fell back below \$3 per million British thermal units in 2014, and the outlook for further gas demand growth in the years to come remains very positive, driven in particular by (1) a continuing increase in the consumption of gas in power generation, (2) the reindustrialization, notably in the petrochemical sector, that the low gas price has triggered, and (3) the LNG export projects that are being developed.

#### *Europe: Declining Demand*

The picture in Europe has been very different, with gas demand in consistent decline. Consumption in 2014 will have registered its fourth successive annual fall, and overall European demand is today well below its level at the turn of the century. There are a number of reasons for this, including overall economic weakness and the impact of policy-mandated energy-efficiency standards, which have put pressure on consumption in the residential, commercial, and industrial sectors. However, the biggest single reason has been the inability of gas to increase its sales into the power-generation sector. Quite the opposite in fact, to the extent that significant amounts of

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<sup>3</sup> BP plc, "BP Statistical Review of World Energy 2014," June 2014, <http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf>.

relatively modern gas-fired generating capacity have been taken out of production and mothballed over the past year or two. This failure, in turn, has been caused by a) the increase in the amount of renewable generating capacity (in the context of weak overall electricity demand) and b) by the inability of gas to compete on cost with coal for the residual power demand.

A major contributor to this situation has been the prevalence, until relatively recently, of oil-indexed pricing in the long-term contracts supplying continental Europe, with high oil prices having effectively priced gas out of the power-generation market. The wholesale renegotiation of these contracts over the last few years, and the general shift to traded market pricing that has resulted from this process, has somewhat improved the ability of gas to compete for this market, but these developments coincided with a renewed commitment on the part of European countries to their renewable energy agendas. This commitment, despite the high degree of subsidization involved, has in turn been motivated not only by the environmental agenda but also by geopolitical concerns about the security of gas supply, notably from Russia. This certainly represents an opportunity missed for gas and perhaps suggests lessons as to how gas can realize its potential in other markets, notably those in Asia.

#### *Asia: Strong Growth Led by China*

In direct contrast with Europe, Asia's gas markets have seen strong demand growth over the past few years, with an increase of nearly 14% between 2010 and 2013. Within that overall picture, China has been the star performer, with an increase of nearly 50% over the period in question, responding to the official policy target—as, for example, incorporated in the twelfth five-year plan (2011–15)—of initially doubling the share of gas in China's primary energy consumption from the 2011 level of 4%, and then further increasing it to 10% by 2020. To meet the increasing demand, China has both promoted the development of domestic production from all sources—conventional as well as unconventional—and sought to diversify its sources of imported gas through a steady increase in the quantities of gas to be imported from Central Asia (Turkmenistan in particular), the development of a new pipeline corridor from Myanmar, and further commitments to imported LNG. A final piece of this jigsaw puzzle was the signing of a major import deal with Russia's Gazprom, about which we will comment further later.

The one disappointment in China's supply strategy has been the slow progress in developing the country's huge shale gas resources, with the technical and economic challenges in doing so proving hard to overcome and production targets therefore having to be lowered. It is worth noting that an important feature of Chinese energy policy has been the focus on the domestic pricing structures, with a clear intent to move toward cost-reflective pricing, such as to provide the appropriate signals and incentives to both the supply and demand sides. This policy has noticeably begun to have an effect on the demand side of the domestic gas market.

Elsewhere in Asia, the demand picture was actually rather mixed. As the figures in Table 1 above illustrate, China alone accounted for nearly 70% of the growth over the 2010–13 period. Furthermore, a substantial chunk of the remaining increase was the result of the tragic nuclear accident at Fukushima Daiichi in Japan in March 2011. Following the incident, Japan had significantly to increase its imports of LNG, coal, and oil in order to replace the nuclear generation that closed down in the aftermath of the accident and that accounted for nearly 30% of Japan's electricity supply. More recently, growth outside China remained rather subdued in 2014, with demand in Japan having largely stabilized and consumption in South Korea having fallen. Further pressure on demand in both countries is likely in 2015 as nuclear generating capacity is brought back online.

And all this is without taking into account the big disappointment of Asian gas demand, namely India, which saw a nearly 20% decline over the 2010–13 period. This was to a large degree the result of a domestic gas pricing policy that provided little incentive to increase domestic production, leading to greater dependence on high-cost imports that the nation could ill afford. Although the recent fall in LNG prices should help alleviate this problem and see LNG imports increase accordingly, a key policy objective in terms of promoting sustainable growth in the Indian gas market must remain the setting of wholesale gas prices at a level that encourages investment in developing domestic production. The Modi administration appears to have recognized this fact, but progress in this respect remains, as always, constrained by the political sensitivities involved.

*Limited Progress toward the “Golden Age”*

One can therefore suggest that even in Asia the golden age of gas has made little progress in establishing itself over the past four years. There are a number of reasons for this, but probably the best place to start is with the pricing structure of the gas supplied into these markets—notably the prevalence of oil indexation and the corresponding absence of a competitive price dynamic responsive to the market fundamentals of supply and demand. In particular, the strength of oil prices since mid-2009 translated directly into prices for imported gas that, just as was the case in Europe, seriously hampered the competitiveness of gas in the power-generation sector when compared with the conventional alternatives, especially coal. This situation has been compounded in some countries, with India being a prime example, by controlled prices for domestic gas exploration and production that fail to provide the necessary incentives to market players to invest. This in turn increases the dependence on much higher-cost imports to supply the domestic market, to the detriment of consumers. Not surprisingly, this situation has created pressure for change. The following section will review the recent evolution of the market in internationally traded gas, and LNG in particular, and consider what this implies for the gas markets in Asia.

**Recent Developments in the International Trade of Natural Gas**

As we look at the recent history of other parts of the global gas market for some possible pointers to how the Asian gas market may evolve over the coming years, in particular involving the potential role of LNG as a catalyst, it is quite interesting to compare developments in Europe with those of the global LNG market. The global LNG market in 2008 was dominated by a limited number of LNG sellers (in particular the rising Qatar), who very successfully segmented the global market. These sellers tied up large volumes of LNG in long-term sales contracts to the United States, Europe, and Asia, carefully ensuring that the prices reflected market circumstances and the obtainable price level in each of those markets. In the United States, the price of LNG was related to Henry Hub, in Europe it was related to the price of pipeline gas supplied under long-term contracts, and in Asia it was based on the lack of alternatives available to Asian buyers and also the ability of Asian buyers to pass on the cost of imported gas to their

customers as a function of their monopoly franchises. Qatar sold on a “delivered ex-ship” basis to its customers and built up a global fleet of vessels to ensure that it would have control over a large portion of the arbitrage potential between markets.

In 2008 and 2009, it was impossible for European buyers to purchase new long-term LNG supplies unless they were prepared to compete with the prices paid by Asian buyers (which they were not, with the exception of one reported transaction involving the Polish national oil and gas company PGNiG that was politically motivated).<sup>4</sup> After the financial crisis, however, some volumes of short-term and mid-term LNG began to flow into the European market. These quantities became available at European traded market prices, significantly below the level of long-term contract pricing, as LNG producers found U.S. demand disappearing as a result of the shale gas revolution and wanted to keep “free” volumes away from the Asian “premium customers.”

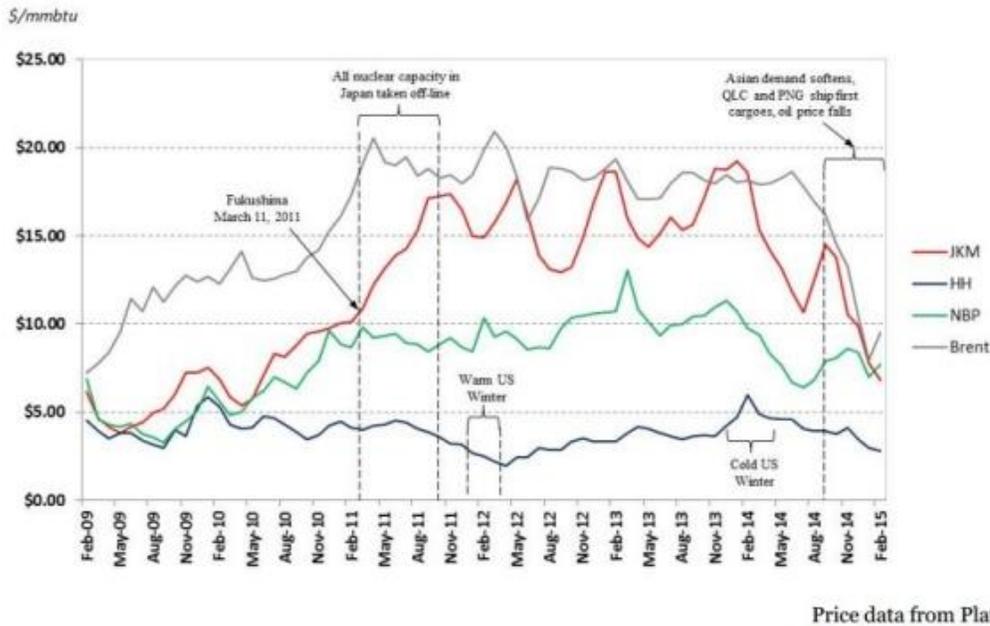
#### *An Aligning of Recent Developments*

The Fukushima Daiichi tragedy in 2011 put a brake on this emerging LNG spot market, as suddenly there was an opportunity to dispose of large volumes of uncontracted LNG at premium prices in Japan. However, the market began to change again in 2014, with the U.S. market continuing to remain self-sufficient, gas demand in Europe remaining weak (because of lack of growth in the power sector), Asian demand growth tailing off, and with some new LNG projects poised to begin production. This has served to renew liquidity in the traded LNG market. The proportion of spot and short-term trade (delivered under agreements of four years or less in duration) rose to 29% of the total flow of LNG in 2014, up from 27% in 2013 and 25% in 2012. The recent rapid swing from a seller’s to a buyer’s market is reflected in the price trend over this period, as illustrated in **Figure 2**.

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<sup>4</sup> The start-up of deliveries—which the market participants claim to be about 30% more expensive than Russian pipeline gas—has been delayed multiple times. According to our information, intensive renegotiations are currently underway, also on a governmental level.

**Figure 2** Asia LNG Spot Prices (Platts JKM) vs U.S. and UK Spot Prices



Source: Platts

At the same time, many Asian buyers have started to commit to U.S. liquefaction projects and shale plays. These customers have contracted for significant amounts of U.S. LNG that will become available over the coming years. The cost of this LNG, on the “free on board” basis on which the contracts have predominantly been signed, will be based on Henry Hub plus the cost of liquefaction. To this then needs to be added the cost of shipping to the destination market (which, it should be noted, will not obligatorily be in Asia, given the flexibility of these contractual arrangements). It is also reported that many buyers, with a perceived strengthening of their negotiating position, have successfully managed to introduce Henry Hub indexation for a portion of their supplies from elsewhere. This is seen as a price reducing element, though there is a question mark as to whether it will have this effect. Among the factors in play in this respect will be the initial pricing structure of the deals in question and, subsequently, the future price trend of Henry Hub gas relative to other indexation components, including any Asian pricing benchmarks that may emerge.

*Looking Forward*

Many analysts are forecasting that the oversupply of the LNG market that has recently emerged could be maintained, and even reinforced, for some time to come, given the significant new supply capacities due to come on stream over the next few years. Could this bring about the same developments as the surplus LNG in Europe in 2009–10, which effectively triggered a complete change in contractual pricing structures?

There are many similarities, such as the improved bargaining position of buyers, buyers becoming more familiar with gas indexation and the associated risks, and a strategic decision to include more short- and mid-term agreements as part of an overall approach of optimizing the portfolio of supply contracts.

However, a number of important factors remain quite different, and in our view will need to change in order to bring about a similar outcome. To begin with, there are often no price review clauses in Asian LNG contracts; hence, other possible triggers for bringing about change to oil-indexed pricing structures will need to be considered. An important factor in this regard is what other benchmarks may be viewed as realistic alternatives. Although a number of reported spot-price benchmarks have emerged (e.g., Platts and ICIS), there is as yet still no Asian trading hub offering the liquidity and transparency both to serve as a genuine sourcing opportunity and also generate a reliable pricing signal.

Possibly an even more fundamental difference is that within the countries where LNG is imported, there does not yet exist the competition dynamic that would allow large customers to apply pressure on their suppliers to provide gas at more competitive prices. This unleashing of the customer was undeniably what provided the greatest impetus for change in the European market. And finally, whereas oil prices, and therefore oil-indexed gas prices, were strengthening in Europe at the same time that traded market prices were weakening as a function of oversupply, this of course is not the case at the present time. The slump in oil prices, and corresponding reduction in LNG contract prices that this is bringing about (with a pronounced lag), may have the effect of reducing the incentive of market players to seek new pricing structures.

### **Where May the Asian Gas Market Go from Here?**

There is perhaps a certain irony in the fact that, as mentioned above, one result of the recent slump in the price of oil is the effective elimination of the Asian premium on quantities of LNG supplied under long-term contract, following up on the disappearance of this premium from the much lower volumes supplied under shorter-term, market-based arrangements. While this is serving to bring Asian prices in line with European prices and to massively reduce the premium over prices in North America, it raises two important and closely related questions:

- Will this slump mean the permanent disappearance of the Asian premium?
- Will it reduce the pressure for change in the pricing structures currently applying to most of the gas supplied into Asia's gas markets?

#### *The Future of the Asian Premium*

As things stand, the answer to the first question is dependent on what happens to oil prices in the future. One scenario is that the current weakness will prove temporary, and once this weakness has choked off further growth in U.S. shale oil production as well as other high-cost sources of production, as the Organization of the Petroleum Exporting Countries (OPEC) and Saudi Arabia hope, the oil price will return to, or close to, previous levels. In that case, in the absence of any change to current pricing structures, the Asian premium has every chance of reappearing, given that prices in North America and Europe are now firmly based on the fundamentals of the gas business and will accordingly tend to reflect the long-run marginal cost of gas supply over time. This cost, in turn, is likely to be well below a \$100 oil equivalent.

A different scenario is that a combination of factors, including structural weakness in oil demand and a general lowering of the cost of supply curve (notably for shale oil), will ensure that any recovery in the oil price is rather limited. In such a case, the Asian premium will itself be restrained, if indeed present at all.

#### *The Prospects for Changes to Pricing Structures*

The answer to the second question is undoubtedly that, other things being equal, there will be reduced pressure to progress the development of different pricing mechanisms. Yet the

question is whether retaining the status quo is a risk worth taking, given the possibility of the first scenario described above. We would suggest that the answer to this question is no: complacency would be dangerous, and the wise course of action will be to maintain the effort to move to different pricing structures, particularly market-related ones that reflect those that predominate in North America and Europe.

### *China's Gas Policies*

In terms of whether this is a view shared by policymakers, it is interesting to look at the actions of those in the region's most important market, China. As mentioned above, China has recently signed a landmark deal to import a very large volume of gas—38 billion cubic meters per annum (bcma) at plateau—by pipeline from Eastern Siberia, and it is known to be discussing with Gazprom a deal for a further 30 bcma from Western Siberia via the so-called Altai line. In signing this first agreement, while no detail has been publicly disclosed, it is widely understood that China, benefiting from the weakness of a Russian seller desperate to demonstrate its own “pivot to Asia” as a means of reducing its dependence on the European gas market, drove a very hard bargain on price.

Any assessment of China's energy policy must recognize its coherence and long-term focus in pursuing established policy goals. With this in mind, we would suggest the following: having already driven a hard bargain on pipeline gas from Eastern Siberia, Chinese buyers, in discussing supply from Western Siberia with Gazprom, will argue that, while the price for Eastern Siberia has to support upstream and midstream investment that will probably be in excess of \$55 billion, the upstream infrastructure in Western Siberia is already in place, and the price for supply from that source should be correspondingly lower. This, in turn, can be seen in the context of a contracting policy for both pipeline gas and LNG that seems designed to ensure not only diversity but also more supply capacity than China, which remains positive about the longer-term prospects for its shale gas, may in the event need. In this way, we would argue that China is actively putting in place the conditions for gas-on-gas competition, with a clear intent to weigh down on the future cost of imported supply (and reduce the exposure to oil price risk). And as part of this process, there are clear signs that it has identified the putative Shanghai hub as the main future trading hub, through which this competition will generate market price signals for both China and also potentially for the broader regional market.

Having concluded that gas should play an increasingly important role in China's energy economy in the future, and having recognized that such an enhanced role would inevitably translate into a huge increase in the need for gas imports, it seems entirely rational that Chinese policymaking should then focus on putting in place, over time, the conditions that will allow for competitive pricing of that supply. And that process, it would appear to us at least, is what can be observed as happening in practice.

The wider implications of this for the region as a whole seem to be that where China leads, others are likely to follow. It is hard to imagine that the other major markets of the region would want to be faced with potentially paying structurally higher prices for their gas supply. Thus, we believe that while the fall in oil prices has seen the Asian premium disappear, this premium is unlikely to reassert itself in the longer term, even if oil prices move back to previous levels. In other words, we suggest that even if the low prices being enjoyed currently do inevitably reduce the incentive for change, Asia's gas market, with China leading the way, is unlikely to be deflected from pursuing its path to becoming, just as has happened in North America and Europe, a "normal" commodity market. In these regions, the price reflects the fundamentals of supply and demand, and in the process enables gas to compete for market share on equal terms with other energy supplies. We would indeed suggest that this is an essential condition for allowing gas to realize its potential. If the pricing dynamic effectively prevents gas from pricing itself into market, and particularly into the key power sector, as happened in Europe in the first decade of this century, that potential is unlikely to be fulfilled.

### **Conclusion**

While the recent fall in oil prices has effectively eliminated the Asian premium applying to gas supplied into the region's markets, this has not removed the structural reasons for the existence of this premium. Though current lower prices may reduce the incentive to address these reasons—a process that had begun before the fall in the oil price—there do seem to be clear signs that policymakers, particularly in China, are focused on taking measures that will prevent a future re-emergence of the Asian premium through promotion of a more competitive dynamic in gas supply. In particular, the development of gas-on-gas competition, which should be accompanied by a process of liberalization of the markets themselves in order to maximize

effectiveness, would serve to bring Asia more into line with the markets of North America and Europe, thereby addressing an issue of competitive disadvantage.

In this way, the move of gas to being a “normal” commodity market would deliver the correct price signals to both the demand and supply sides, something that in turn would enable gas to compete more effectively for market. This, especially if accompanied by an appropriate carbon-pricing regime, would then support the role that gas can undoubtedly play in mitigating CO<sub>2</sub> emissions in a cost-effective manner and, in the process, provide the opportunity to fulfill the potential of the golden age of gas in Asia.