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Europe's Evolving Gas Market: Future Direction and Implications for Asia

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EXECUTIVE SUMMARY

This paper considers current developments in the European gas market, whether the pressure being placed on the historically predominant oil-indexed pricing structure will lead to fundamental change in the way that gas is priced in this market, and what effect this might have on the Asia-Pacific gas market.

Main Argument

A notable characteristic of the natural gas industry has long been its regional fragmentation, which has resulted in substantial variation in the trade and pricing of gas in different markets. In the U.S. and UK, prices are set as a function of gas-on-gas competition, whereas in continental Europe and East Asia, the predominant pricing mechanism involves indexation to oil. The limited volume of international, and in particular interregional, trade has enabled these pricing disparities to persist and prevented the emergence of a global gas market with a single price. Recently, however, the combination in Europe of an increase in supply availability, particularly of market-priced LNG, and recession-driven demand weakness has led to the emergence of a surplus that has in turn created a significant disparity between the market-based and oil-indexed gas pricing models, sparking calls from customers for more competitive pricing. While there is now the real likelihood of market reform in Europe, the dynamics of the Asia-Pacific markets prevent any broad conjecture about liberalization. There does appear to be potential, however, for China to reflect these developments in its price negotiations with potential suppliers, such as Russia, and for other nations in the region to follow Beijing's lead.

Policy Implications

- Of the potential scenarios for how Europe's current two-tier pricing structure may evolve, the traded market price will most likely maintain a significant discount to the oil-indexed price, provoking ongoing consumer insistence on reform and leading to a shift to full market pricing in Europe.
- European liberalization could have significant implications for prices in Asia. One possible consequence is China seeking to reflect developments in the European market when negotiating future gas import requirements, particularly with Russia.
- A successful pricing change for China could then lead other countries in the region to negotiate prices lower than those of oil-indexed markets, effectively liberalizing Asia-Pacific gas markets.

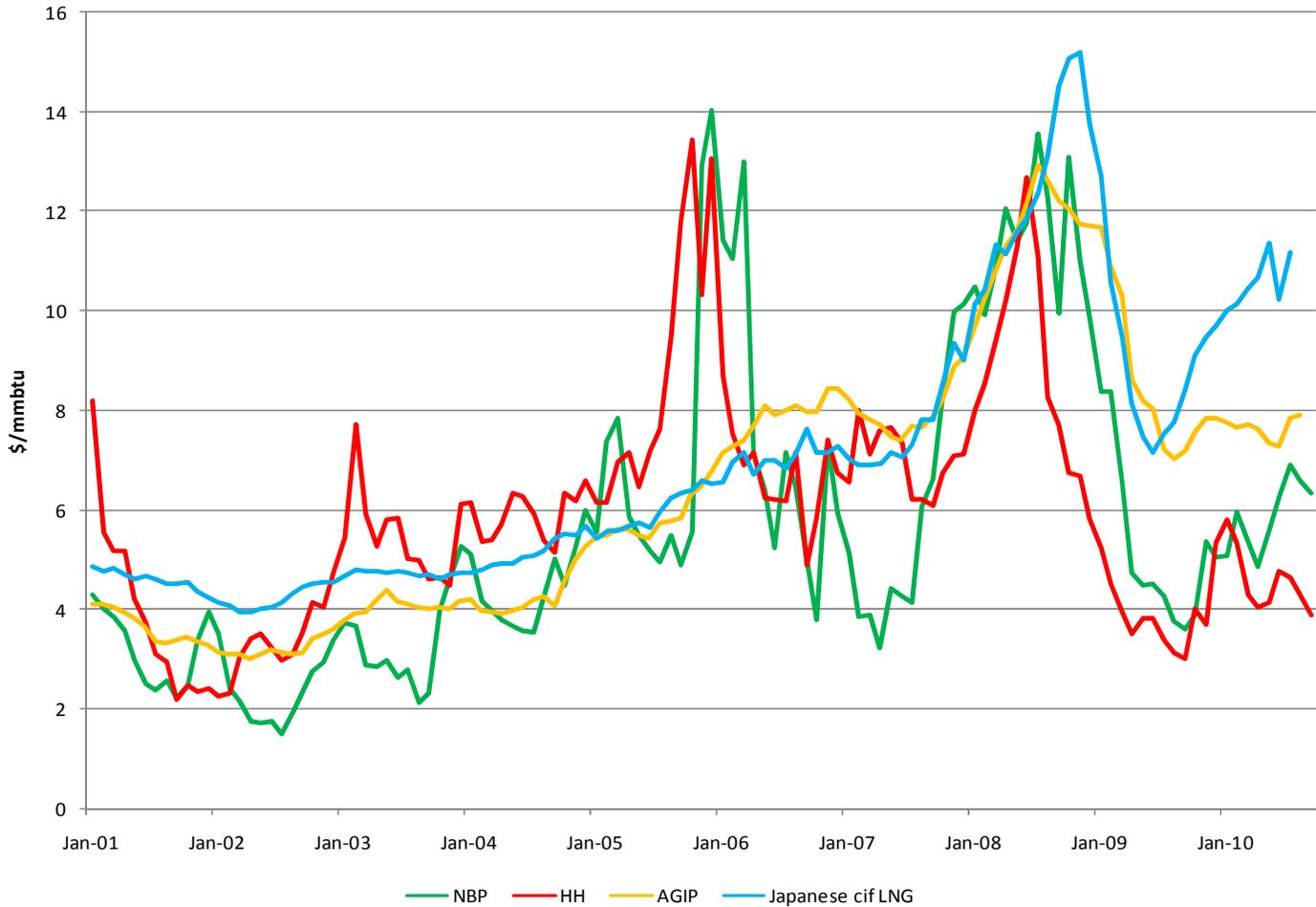
Certain characteristics of the natural gas industry—in particular, its heavy infrastructural requirements and consequent natural monopoly features—have often resulted in a regulated market structure in which competitive market dynamics play little role, including in terms of price-setting. It was not until the 1980s that competition was first introduced into a gas market, with the United States’ decision to embark on the deregulation of its gas industry. The U.S. example was then followed by the United Kingdom in the 1990s, and competitive gas markets developed in both nations, with, among other things, prices coming to be set as a function of the interplay of fundamentals through traded markets. These two markets have, however, remained the exception, with the competitive dynamic largely absent from the rest of the world’s markets, markets that have remained fragmented on a national and regional basis as a result of those same industry characteristics previously referred to. In continental Europe, for example, even the attempt, begun in the late 1990s, to promote a liberalization agenda under the umbrella of the policy goal to create a single energy market has brought about little change and introduced only limited competition in the gas market.

However, a number of factors have combined over the last year or two to place the status quo under considerable strain, and signs of radical change can now be clearly observed in the market. This raises the question of whether such pressures will bring about fundamental structural change: the basic premise of this paper is that, of a number of potential pricing scenarios, the most likely is that market-based pricing will replace oil indexation as the dominant gas pricing dynamic in Europe. If this does prove the case, the implications for gas markets in the Asia Pacific region become interesting. In the first instance, China’s negotiations with Russia regarding the pricing of future gas imports are unlikely to ignore developments in Russia’s other main export market. The outcome of these discussions could in turn have an impact on gas pricing more broadly through the region, notably via the volumes of liquefied natural gas (LNG) that will perhaps be competing with Russian gas to supply the Chinese import requirement.

**No Such Thing as a Global Gas Price:
The Wide Variety of Regional Gas Prices over the Past Decade**

As **Figure 1** illustrates, there is no such thing as a global gas price. The last ten years have featured significant, and hugely fluctuating, differences in prices in the world's mature gas markets. Prices in two areas, the United States and UK, have been set by the fundamentals of gas-on-gas competition, whereas in the other two, continental Europe and East Asia (Japan, Korea, and Taiwan), prices have predominantly derived from contractual indexation to oil and/or oil products. These very different pricing dynamics have resulted in major disparities; for example, earlier this year, the price of LNG imported into Japan under long-term contract was nearly three times the level of the U.S. Henry Hub price (the Henry Hub being the most heavily traded U.S. gas market, and providing the main pricing benchmark for North America). That these disparities can occur with such regularity is a result of one notable difference between the world's oil and gas markets, namely the lack of fungibility in the internationally traded gas market. Only LNG, for example, has provided any ability to trade between the Atlantic and Pacific Basin markets, and therefore to generate the arbitrage that tends to erode those price differentials. Further, LNG has historically constituted a very small share of supply to the world market, accounting in 2009 for some 28% of the gas traded internationally, which itself only represented roughly 30% of global gas consumption. In other words, LNG only accounted for some 8% of global gas supply; however, even that number overstates its actual impact on pricing, given that a large proportion of LNG is supplied under long-term, take-or-pay contracts and therefore is not available to exploit those arbitrage opportunities.

FIGURE 1 Key Regional Gas Prices, 2001–10



The result of this lack of liquidity has been that, while there have been cargoes of LNG traded on a “spot” basis over the past years, and very generous arbitrage margins earned in the process, the volume of this trade has simply not been enough to connect the different regional markets in such a way as to harmonize prices between them and foster the emergence of a global gas pricing structure to mimic that of the oil market.

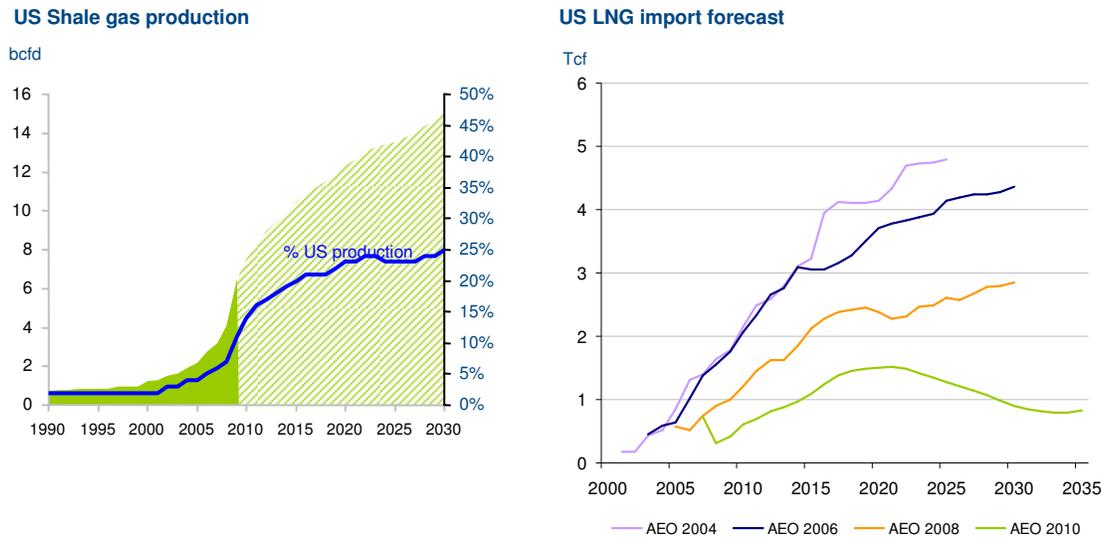
Recent History: The Arrival of the “Perfect Storm”

The last two years have witnessed something of a perfect storm in the international gas market, with three elements combining to create a substantial surplus of available supply when compared to actual market demand:

1. The shale gas revolution in North America, where the unexpectedly rapid ramp up in the production of shale gas has reversed the previously observed decline trend and restored that market to effective self-sufficiency
2. The entry into service of significant new liquefaction capacities, in particular in Qatar, which had been built with a view to filling the emerging supply deficit in the United States, and whose volumes have effectively been displaced onto the world market by the rapid increase in shale gas production
3. The slump in demand caused by the economic recession

Figure 2 illustrates two of these components by showing the dramatic increase in shale gas production and the corresponding decline in the need for LNG imports, as witnessed by the successive declines in the import forecasts made by the U.S. Energy Information Administration (EIA).

Figure 2



This conjuncture of circumstances has served to create a substantial overhang in global gas supply (termed a “gas glut” by the International Energy Agency, or IEA), particularly in the shape of significant volumes of LNG seeking an alternative market from the originally intended U.S. market. The impact of this overhang has been keenly

felt in Europe, which is one of the few places where LNG has had the opportunity to displace other sources of gas (principally supplied by pipeline) in the market, and also a mechanism for doing so via the European traded markets, of which by far the most important is the fully contestable UK market. The outcome has been a sharp disconnection between the two different gas pricing structures found in the European market, namely the spot price generated by the UK traded market (and mirrored in the prices of the related continental traded markets) and the oil-indexed price structure under which most of the continent's gas has traditionally been supplied. Figure 1 shows that from mid-2008, when these two prices were much the same, a gap had opened up within the span of no more than a year to the extent that the oil-indexed price was double the spot price. Although the two prices have subsequently reconverged to a degree, there is little question that the opening of this gap has created a tension in the market and may have triggered a process of change with profound longer-term implications for how gas is supplied and priced in the continental European market.

All Change in the European Gas Market?

To address the question of whether the changes that have already been witnessed in the European market are the first steps down the road to profound longer-term change, or whether they will just prove a blip before “normal service” is resumed, as Gazprom, among others, has suggested, it is clearly necessary to consider not only the evolving market fundamentals but also the institutional context in which they are set.

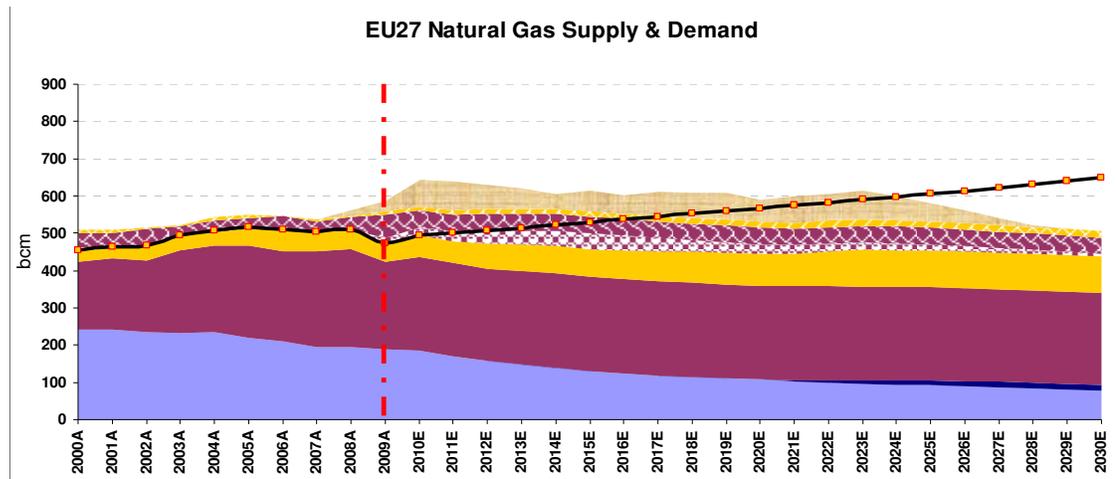
The Supply/Demand Outlook

The “perfect storm” described above unquestionably brought about a major imbalance between the quantity of potential gas supply available to the market, on the one hand, and the recession-affected level of demand on the other, with EU demand in 2009 down by more than 6% when compared to the previous year. It is important to note that, even before the recession reduced demand and the new supplies of LNG became available on the world market, Europe was in a comfortable supply position as a

consequence of the unrealized demand growth from previous forecasts. Back in the first half of the decade, there had been a confident expectation that gas consumption in continental Europe would grow strongly, driven primarily by increasing penetration of gas into the power generation sector. The volumes committed to under long-term take-or-pay contracts were increased to allow for this growth, and, furthermore, investments were made in the productive capacity and delivery infrastructure to enable those contractual commitments to be met. However, much of the anticipated growth in demand from the power sector has failed to materialize owing to the steady strengthening of the oil-linked gas price as OPEC reasserted its grip on the oil market, significantly reducing the competitiveness of gas in the power market. This was compounded by the unanticipated arrival on the power market of significant amounts of renewable generating capacity, further limiting the scope for new gas-fired power. Thus, as far as the gas market was concerned, the “double whammy” of newly available supply and slumping demand made itself felt on a market already facing a comfortable overall supply position.

This imbalance resulted, as referred to above, in the sharp divergence between spot and oil-indexed prices. The extent to which the imbalance continues, both in terms of duration and degree, will be a key determinant of whether the pricing disconnect continues, and accordingly of whether the pressure for change is maintained. In 2010 a combination of a severe winter, the restoration (in certain countries at least) of economic growth, and high coal prices contributed to a relatively strong recovery in gas demand. As **Figure 3** illustrates, however, this still leaves the market with a large overhang of potential supply.

FIGURE 3 EU-27 Natural Gas Supply and Demand



Source: Arthur D. Little

This analysis, in which the black line represents demand and the colored tranches represent the different categories of gas (domestic production, contracted and uncontracted pipeline gas, and LNG) available to the market, indicates that a significant structural surplus exists and will take a number of years to work itself out. Furthermore, the channel through which the overhang can predominantly seek to access the market will be the contestable traded market, which as of today still accounts for a rather small, even if growing, proportion of the continental European market. This increases the likelihood that the traded market, or spot, price will continue to offer a discount to the oil-indexed price for some time to come, although the materiality of such a discount will reflect, inter alia, the following factors:

- Demand for the available global surplus of LNG from other markets, both the established ones (Japan, Korea, Taiwan) and the newer, growing ones (such as China, India, Chile, Argentina, Kuwait), over and above those volumes already secured under long-term contractual arrangements
- The pace of demand growth in Europe, including the influence of weather conditions
- The discipline the supply side shows in possibly declining to make spare capacity available to the market
- The future trajectory of the oil price itself

All these factors can of course operate in two directions, either adding to or subtracting from the imbalance, but the evidence would appear to point to an ongoing opportunity for customers to change the terms on which they procure gas supplies, on the condition that they have both the ability and the willingness to flex their purchasing muscles and exercise choice.

Regulatory Developments: The Unleashing of the Customer

Although the process of liberalizing the European gas market has been painfully slow, with a third directive now being implemented after two previous ones produced very little by way of competitive market conditions, there has nevertheless been some progress made in giving customers the power to exercise choice. In the German market, for example, whereas in the past the major importers/wholesalers were able to transfer commitments under long-term contracts to their customers, an early initiative of the newly constituted German regulator was to introduce limitations on the extent to which wholesalers could lock up customers for long contractual periods. This freed customers to seek alternative supplies for at least a proportion of their needs on what for some has become an annual basis. The competitive tension that this introduced was limited as long as all the gas available to the market was essentially priced on the same oil-related basis. The picture changed in 2009, however, with the development of greater, even if still limited, liquidity in the continental traded markets and, more importantly, the enhanced visibility that was provided to the existence of a different, and much lower, gas price.

This greater transparency meant that no customers could fail to appreciate that gas was available at a price considerably lower than what they were currently paying. It is worth acknowledging the fact that, whereas such gas was physically available at the traded hubs, continuing obstacles to competition, especially in terms of access to infrastructure, meant that in many cases customers would have faced difficulty in getting such gas delivered to their sites in a cost-effective manner. What counted, however, was the knowledge that an alternative pricing mechanism existed that offered lower cost supplies, especially at a time of recession when many customers were facing extremely challenging conditions in their own markets, and were under great pressure to reduce

their own costs. This situation gave rise to demands on suppliers to reduce prices, and in an overall context of shrinking demand and pressure to retain market share concessions became inevitable, leaving wholesalers no choice but to begin offering “market-related” prices for at least some of the gas supplied to the market.

Pressure on Producers to Renegotiate Pricing Terms

As wholesalers were forced into these concessions, they faced the growing problem of, on the one hand, supplying increasing volumes of gas into the market on a spot-related pricing basis, while, on the other hand, still having to pay oil-indexed prices to their suppliers, the gas producers, under the terms of long-term contracts. One option was, of course, to source gas themselves on the spot market to substitute for this higher-cost gas, and this has indeed happened. However, this then exacerbated the problem of the take-or-pay commitments under these contracts, with wholesalers across Europe seeing their desired offtake fall below these levels. In these circumstances, faced with an inherently unsustainable situation, wholesalers were obliged to reopen discussions with producers with a view to sharing the pain with them.

The last year or so has witnessed a process that began with a predictable reluctance by producers to entertain any change to the contractual commitments that had been willingly entered into by buyer and seller, but that has seen cracks gradually appear in this edifice. 2010 saw a number of concessions begin to be made. The confidential nature of the contracts in question, and of the discussions around them, means that not all these concessions are in the public domain. What has been formally acknowledged is the agreement of both Gazprom and Norwegian suppliers to apply spot market pricing to some of the volumes supplied under their existing contractual arrangements, with Gazprom initially having announced that such pricing would apply to 15% of the contractual quantities in question. As far as gas from Norway is concerned, no figures have been formally confirmed, but it is understood that the percentages in question have, in some cases at least, been higher. Furthermore, it is reasonable to assume that considerable flexibility has been shown in these discussions, particularly around the issue of volume/take-or-pay commitments. Gazprom has also been very explicit in stating that these are temporary concessions, limited to a period of three years, that acknowledge the

current pressure in the market place but that will be phased out when renewed market growth returns things to “normal.” The question now is whether this view of what is normal will prove to be correct or whether the concessions that have been made will be the precursor to profound structural change.

So Where Is the European Gas Market Now Headed?

As mentioned earlier and shown in Figure 1, the year 2010 has seen, contrary to the expectations of many (including this author), a reduction of the gap that opened up in Europe between the traded market price and the oil-indexed price in 2009. Explanations for such an outcome include both demand recovery, partly due to a particularly cold winter, and a substantial shortfall in the amount of gas expected to be available to the market, particularly from Qatar, where there was both prolonged unplanned maintenance of existing liquefaction capacity and slippage in the commissioning of the last two “mega-trains” being built, but also from Norway, again as a result of the extended downtime of gas processing capacity. However, although the gap diminished in size, it did not close altogether. Spot market gas has, therefore, continued to be available to customers at a discount, providing an opportunity that customers have continued to exploit while maintaining pressure on suppliers in order to reduce purchasing costs. Looking forward, one can identify, in broad terms, three possible scenarios:

1. *Return to status quo ante.* A continued strengthening of market fundamentals, featuring both continuing demand growth and withheld (whether for technical or for commercial reasons) supply, eats into the supply overhang and further erodes the spot market discount, to the point where customers have little incentive to push for change and oil indexation remains the predominant pricing dynamic in the market.
2. *Dual pricing structure proves durable.* The level of discount does not erode further, but the market learns to live with a two-tier pricing structure, with many customers prepared to pay a higher oil-indexed price in return for the security of supply that it is deemed to deliver.

3. *Transition to full market pricing.* Market fundamentals do not improve sufficiently to make much impact on the overhang, at least in the short-medium term, with the result that the spot market price maintains a significant discount to the predominantly oil-indexed price, inciting continuing customer militancy that in time leads to a phasing out of oil indexation and its replacement by market pricing.

The opinion of this author is that the third scenario represents the most likely outcome, for the following reasons:

- A two-tier pricing structure simply does not appear sustainable. It would require a significant degree of price insensitivity on the part of a large number of customers, who would have to be prepared to pay a higher price in the full knowledge that others were paying less. For industrial customers at the very least, the issue of competitive advantage makes this rather implausible.
- On the supply side, the technical factors that caused reduced availability in 2010 seem unlikely to be repeated, and there will be further additions to liquefaction capacity in the near future, notably in Qatar. This does not rule out the possibility of supply side discipline in managing the amount of gas offered to the market, but the huge investment in supply infrastructure and the corresponding penalty involved in leaving it under-utilized mean that such discipline comes at a cost. There is also the added question of whether producers—in particular, the “traditional” ones—are willing to shoulder the burden, especially if it looks like this burden will be prolonged.
- As far as demand is concerned, it is unlikely that the recovery momentum seen in 2010 can be maintained for long; as previously mentioned, that increase can be attributed in large part to a combination of a particularly cold winter, high coal prices, and the resumption of a higher level of economic/industrial activity after the recession. For these drivers to make a further sustained contribution to growth, there would need to be a repeat of those severe weather conditions and, before too long, an increase in industrial capacity of an energy-intensive nature. These conditions seem inconsistent with broader economic trends in Europe, and

demand in the core industrial and residential/commercial sectors is in fact potentially more exposed to downward pressure from the increasing policy focus on energy efficiency, which has already made itself felt via the plethora of mandated measures and programs that have been introduced and will continue in the coming years.

All these reasons place the spotlight on power generation as the only sector offering real potential for sustained demand growth, a characteristic that the European gas market shares with its North American counterpart. Reference was made earlier to unrealized demand from the power sector over the last decade or so having contributed to the gas supply overhang that developed. The realization, or not, of that potential demand in coming years will be a key factor in determining to what degree that overhang will be eroded, and at what pace. Of crucial importance in this respect will be the pricing of gas in the competitive context of the power market and political perceptions of gas in the great security of supply debate.

Gas and power and the competitive dynamic. As discussed earlier, the indexation of the gas price to oil was instrumental in the failure of gas to capture its anticipated market share, and it can be argued that if gas retains its indexation to oil, a repeat of that disappointment lies in store. For the fact remains that whereas in the other demand segments inter-fuel competition, with gas oil and fuel oil in particular, means that oil indexation has, or had, a certain commercial logic, this logic does not apply to the power generation sector. One can therefore understand the reluctance of electricity generators to accept indexation of their feedstock to a commodity of no relevance to the competitive dynamic encountered in their own marketplace, thus rendering them potentially vulnerable to the behavior of an oil cartel. And it should be added that this reluctance is increasingly shared by the broader market.

There is no question, at least in the minds of the gas industry and its advocates, around the potential role that gas, with its well-known attributes, can play in reducing the carbon intensity of the power sector and acting as a bridge to a low-carbon future. But in order to realize this full potential, gas will need to compete for this market because alternatives such as nuclear and renewables do exist, with a carbon capture and storage

(CCS)–enabled comeback for coal also a future possibility. All these alternatives face challenges of their own, whether in terms of cost structure, timing, or acceptability, but they nonetheless represent competition to gas. Gas will therefore need to be offered to the power market on terms that reinforce its own competitiveness, and it can be argued that this requirement is simply not consistent with a continuing linkage to oil prices.

Politics and perceptions. One factor that should not be underestimated is the geopolitics of security of supply. One of the major obstacles in the path of greater penetration by gas of the power sector in Europe is the perception that this will lead inexorably to greater dependence on gas imports, particularly from Russia. This perception plays strongly into the hands of, and is duly exploited by, the proponents of the alternatives to gas and also resonates strongly with politicians and policymakers across the European spectrum. The gas industry thus has no choice but to address this perception head on, and the most effective way of doing so will be through promoting its own perception of gas as a commodity offering plentiful and diverse supply, with this diversity playing out through healthy gas-on-gas competition, which ensures a fair deal for consumers. In this regard, oil indexation arguably constitutes a handicap, being commercially incompatible with the existence of a healthy traded market dynamic, which would logically set prices. More subjectively, oil indexation can also create in the mind of politicians a negative symbolism associated with the continuing foreclosure of markets by the long-term take-or-pay contracts entered into with a limited number of suppliers—and in the case of some of those suppliers compounding the dependency issue that oil market volatility has brought into such sharp focus politically. A move away from oil indexation, therefore, would arguably constitute a positive step in creating the political “comfort zone” for gas more easily to fulfill its market potential.

In summary, then, the contention of this author is that a combination, set in the geopolitical context briefly discussed above, of weak market fundamentals, on the one hand, and the need for gas to compete on price for the growth potential available to it from the power sector, on the other, means that a continuation of the shift away from oil indexation as the dominant pricing dynamic in Europe is highly likely. Further, commercial logic dictates that this will not stop at some “halfway house” where both pricing structures coexist, but rather will lead to a situation where gas supplied into the

European market is overwhelmingly priced as a function of the interaction of supply and demand through a traded market, as is already the case in North America and the UK. One final point worth making in this respect is that such a transition would not necessarily mean the end of the long-term take-or-pay contracts that have been the historic bedrock of supply to the European market, despite the perceived association between such contracts and oil indexation referred to above. On the contrary, there is no fundamental incompatibility between such contracts and a liquid traded market, as long as the buyer is assured of the competitiveness of the gas supplied under the contract in question by virtue of the price paid being the market price. The changes seen in the European market in 2010 have, furthermore, been entirely consistent with such an evolution.

What Some Industry Experts Say

The views expressed above are the personal ones of the author, and it goes without saying that there exists a wide diversity of interpretations and opinions concerning the future path of the gas business in Europe. In particular, the views of many on the supply side of the industry do not coincide with those of the author, with mention already having been made, for example, of Gazprom's very different assessment. With a view to providing a range of perspectives that derive from independent expert analysis of the industry rather than from the promotion of any agenda or set of interests, the author sought the views of a number of highly respected industry authorities regarding the three scenarios sketched out above. Their opinions can be summarized as follows:

Professor Jonathan Stern, Director Gas Programme, Oxford Institute of Energy Studies:

I personally believe that the gas business in Europe is now firmly engaged in a process of transition leading towards the third scenario identified by the author, and I equally believe that this is an entirely rational development. Oil indexation has outlived its usefulness and has little remaining logic in today's market context. It did of course possess an original justification because in order to justify the investments in infrastructure needing to be made, it was essential to ensure that newly arriving gas could displace oil products and obtain a certain level of market share. But in the major European gas markets that point is long past, and I see no reason why gas should not now become a "normal" commodity market in Europe. The "perfect storm" brought into sharp relief a significant imbalance in the fundamentals of supply and demand, but also the irrationality of a price structure that was completely divorced from those fundamentals, and unable to make any contribution towards redressing it.

As regards the market's changing fundamentals, I would note that the divergence in 2009 between the UK traded market price and the continental oil-indexed price to which the author refers also existed, to much the same degree, in 2007. That gap rapidly disappeared, which raises the question as to why things should be sustainably different this time. For the answer we can look to the components of the perfect storm, and in particular the wave of LNG released onto the market to compete for a level of demand rebased downwards by the recession. And that availability of LNG has been matched by the market's ability to receive it; from having in 2007 only one LNG import terminal with a capacity of some 5% of the national demand level, the UK has since seen the capacity commissioned to bring this figure up to around 50%.

Madjid Kübler, Managing Director, TEAM CONSULT, Germany:

When considering future developments, it is often instructive to look at what people, by which I mean industry players, are doing as well as, or sometimes in spite of, what they are saying. One significant trend that we have observed in the German market over the past one or two years is the establishment of trading floors and competencies at a large number of gas utilities. Almost all the wholesalers, and quite a number of retailers have gone this way, and even those lacking the critical size or knowledge have organized themselves into consortia and/or engaged third party specialists to manage their portfolios. It is equally interesting to note the increasing importance attributed to trading by the producers, most notably demonstrated by Gazprom Marketing & Trading's recent announcement that they would be recruiting hundreds of additional personnel into their London office.

Overall then, I think we are definitely witnessing a trend away from scenario 1. It could happen that the intermediate transformation stage described by scenario 2 could last for quite some time, if a significant number of gas players on the demand side prefer to adopt a hybrid strategy (long-term oil-indexation, short-/mid-term gas indexation), something that we are presently observing at all levels of the value chain. However the likelihood is that in time we will end up in scenario 3, given the complexity of sustaining a 2-tier pricing mechanism.

Jean-Guillaume Richard, leading authority on the European electricity market,

France:

As regards the future development of the European gas market, I would personally attribute the highest probability to the third scenario. I do furthermore believe that the power market will play a key role in this respect, as gas will need to compete effectively if it is to realise its potential in this sector, and continuing oil indexation would certainly undermine this competitiveness. And if gas fails to realise this demand growth potential, the supply overhang will of course last longer, itself increasing the pressure for change.

If you are looking for signposts to the future, I would point to the gas pricing decree currently being prepared by the French authorities for implementation in the spring of 2011, which will incorporate spot pricing into the price formula for the first time. The proposed percentage in question may only be 10%, and may appear small, but I would see it as highly symbolic, a first step down the road to a very different pricing environment.

Some Concluding Thoughts on Possible Implications for the Asia-Pacific Gas Market

The question that arises is, if continental Europe does follow the example of North America and the UK and transitions to a competitive gas market dynamic where prices are set by gas-on-gas competition, what will this mean for the pricing of gas, and in particular internationally traded gas, in the Asia-Pacific region? In other words, and especially if such a change leads to European customers enjoying structurally lower gas prices, will this create a pressure for a similar transition to take place in Asia-Pacific gas markets, with oil indexation losing its role as the predominant price-setting mechanism? In considering this question, it must be acknowledged that these markets have very different characteristics from their European counterparts, not to mention between each other, which makes the provision of an answer applying to the region as a whole difficult and inappropriate. Two important areas of difference can be cited:

1. *Absence of market structures.* As of today, there are no fungible traded markets yet to be found in the region, and therefore no pricing signals being generated that could provide an alternative to the pricing mechanisms currently being applied, unless there were a willingness to “import” these pricing signals from outside the region.
2. *Different structure of demand.* The power sector is in general a less significant source of both current and, importantly, incremental demand in the markets of the Asia-Pacific region. This means that in many cases gas is competing with, and looking to displace, oil and oil products used in stationary applications. As such, the dynamics of inter-fuel competition mean that there is a stronger logic to a linkage with the price of oil and less pressure to move decisively away from such a linkage.

It is fair to say, then, that a number of obstacles hinder any transition, including the important one of the familiarity and comfort of gas market players, on both supply and demand sides, with the current structure. However, this same familiarity has been a feature of the continental European market until very recently but is proving vulnerable to the market forces that have been unleashed.

Perhaps a way of rephrasing the question is whether markets in the Asia-Pacific region will maintain the status quo for internationally traded volumes in the face of an increasing awareness that this policy is resulting in customers across the region paying more for gas than their counterparts in North America, and now Europe, are paying? There would seem, to this author at least, to be every chance that China, as the world's biggest single source of gas demand growth, will play a pivotal role in providing answers to this question:

- Gas is destined, as a function of official policy goals, to play an increasingly important role in the Chinese energy economy, with at least a planned doubling of its contribution to primary energy supply. In the context of overall economic growth, this will obviously lead to an enormous increase in the amount of gas consumed.
- China will do everything possible to ensure that as much of this demand as possible is met by domestic production, and will promote supply from every possible source of both conventional and unconventional gas, including from technologies such as coal gasification.
- Despite every best effort in this respect, however, demand growth is still almost certain to translate into a steadily increasing requirement for imported gas. In anticipation of this outcome, China has been actively building a diverse portfolio of international supply sources, including major pipelines to access gas from Turkmenistan and Myanmar and contractual commitments to enable the construction of significant new liquefaction capacity, notably in Australia.
- One conspicuous absence from this developing supply portfolio has been an agreement for China to import gas from its neighbor, and the possessor of the world's largest gas reserves, Russia. Discussions over many years have yet to produce any firm commitments, and the issue of price has clearly been the main sticking-point. One interpretation is that China has sought to ensure that it has a number of alternatives in place before committing to supply from Russia. It can also be assumed that as China responds to Russia's increasing enthusiasm to sell huge quantities of gas, Beijing is watching what is happening in Europe very closely; in particular, China is unlikely to want to pay a premium to what Russia

is able to secure from its European customers. There would therefore seem to be a possibility that Russia at some point will be faced with a choice between supplying gas to China on essentially the same terms as it offers to the European market and seeing Chinese demand go elsewhere. If Chinese demand growth turns out to be so strong that it has no choice but to commit to major imports of Russian gas, then Russia will obviously be in a better position to impose its own preferences regarding pricing. There is every sign, however, that China is doing all it can to avoid such a position.

- There is thus clearly a scenario where China, motivated by a desire to minimize the future cost of its growing import requirement and therefore working actively to promote a structural surplus of potential supply to the Chinese market, succeeds in putting in place a competitive dynamic between multiple possible supply sources such that Russia finds it difficult to justify discriminating against China in pricing, as compared with the prices paid by major Western export markets.

To conclude, then, a change in the European pricing dynamic as discussed in this paper might well come to have, in time, a direct bearing on the terms under which Russian gas is supplied into the Chinese market. This will certainly not happen overnight, but if China is indeed successful in engineering a situation of gas-on-gas competition between the international supply sources competing for its market, such a change in the pricing of a potentially significant source of supply will hardly fail to have important implications for other suppliers. Those other suppliers include the sellers of LNG, who would find it difficult to offer price conditions to Chinese, and no doubt Indian, markets that they would not offer elsewhere. In this way, and just as has happened in the Atlantic Basin, LNG could prove to be the conduit for broader change in the pricing structure of gas in the Asia-Pacific market, taking its cue from the region's dominant growth market. Just as in many another domains, where China leads, others are likely to follow.