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GOVERNANCE

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The New Rules of the Game

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The Evolving Role of LNG in the Gas Market

Dick de Jong, Coby van der Linde, and Tom Smeenk

The global energy scene is changing rapidly. Producing countries are tightening their grip on the development of their resources, emerging (and other) economies are taking a direct political interest in securing supplies, politics and business are increasingly integrated in international energy deals, and energy is on the political agenda of every government. Compounding this, prices of energy skyrocketed over the four years leading up to August 2008. As a result more gas resources became economical to develop, creating more supply potential than before.

However, the severe crisis in international financial markets and national banking systems is now changing this outlook. Prices have come down, and this, combined with the current decline in economic activity, is likely to affect the timing of investment decisions on new pipeline and liquefied natural gas (LNG) projects. The impact on national economies on energy demand, and on the relative position of gas in the energy market could be considerable. At the same time, some consuming countries are also reviewing the environmental effect of their energy policies and the security of their energy supply. Any change in these policies could affect the place of gas in the energy mix. These developments are still unfolding; it is difficult to say at this stage in what ways and to what extent the position of natural gas will change.

Nevertheless, some expect further globalization of the gas business, with different market structures, more fragmented value chains, more flexibility in supplies to markets, and shorter term contracts. In this respect, LNG is regarded as the major potential game changer. Indeed the LNG business model has been changing over recent years into one of greater flexibility, promising producers higher rewards, albeit in return for higher risks. More recently the perspective of high rewards in a market hungry for supplies has changed radically, at least for the next few years. A global crisis, lower oil and gas prices, and reduced demand have created a new business environment. Whether the changing business model will progress into a new way of doing business depends on a number of factors:

—The risk appetite of LNG suppliers to continue to develop their resources on the basis of the new business models in the current situation of lower or volatile energy prices.

—The ability and willingness of the markets, particularly European and to a lesser extent Asian LNG buyers, to accept and manage the supply risks associated with this new business model.

—The preparedness of producing and consuming governments to distance themselves from LNG transactions.

This chapter examines developments in the global gas market, the main markets for natural gas and the position of LNG in these markets (particularly Europe), and higher risks in the LNG business and risk management mechanisms for mitigating short-term supply disruption.

Developments in the Global Gas Market

The following reviews general developments in the global supply and demand balance in natural gas, assessing current trends in still regionalized markets in the United States, Asia, and Europe. The tendency of governments to enhance state control in the gas industry and the potential of the Gas Exporting Countries Forum (GECF) for producer countries to coordinate their policies are also examined.

Global Supply and Demand: From Feast to Famine?

While demand for energy has grown globally, leading to competition for new supplies among gas markets, world gas reserves are sufficient to satisfy gas demand—including the expected increase in demand for LNG—for the foreseeable future. The bigger issue, however, is not the availability of reserves but

the pace of and potential for development. In recent years, the global development effort, both in pipeline gas and LNG, did not in this respect keep pace with demand prospects.

In recent years rising gas prices have had a considerable effect on the LNG business. First and foremost, hitherto stranded gas resources became economical candidates for new LNG projects, leading to a greater variety of potential LNG suppliers. In addition, LNG suppliers became bolder in their approach to risk, entering into more flexible and shorter term business transactions. However, new developments have been slow to reach their final investment decisions not just for LNG but also for pipeline gas. These projects have virtually ground to a halt, in view of lower gas prices and sagging demand. During the forthcoming years LNG may even glut the global market, as new capacity starts production at a time of economic slowdown and reduced demand for imports in the U.S. market. This surplus may create a sense of comfort, but it may be short-lived.

Regional Markets Remaining Regional?

The question is whether by 2015 there will be enough new capacity of pipeline gas and LNG to meet demand in the three main regional gas markets: the U.S. market, the Asian market, and the European market.

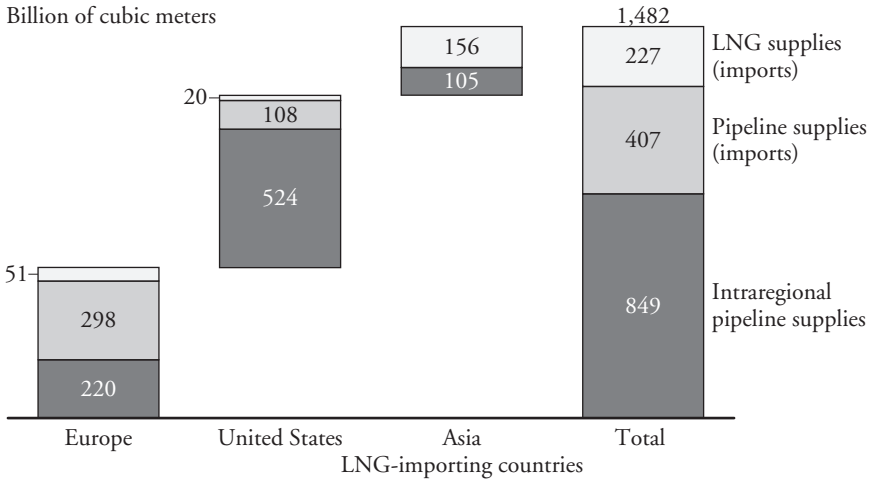
THE U.S. MARKET

The U.S. market is characterized as deep, liquid, and based on short-term trade. For a long time the North American market was self-sufficient, but after the year 2000 domestic supplies started to fall, and U.S. demand was increasingly difficult to satisfy. In 2007 the United States imported roughly 20 percent of gas supply (figure 11-1). Most came from Canada via pipeline (106.9 billion cubic meters). The rest was LNG (20.1 billion cubic meters).

The U.S. market does not employ the business model of long-term contracts between buyers and sellers, the staple of the Asian and European markets. Rather, it offers a market in which any volume of gas can be sold at the prevailing spot price. For example, when incremental supplies from Canada were no longer available, U.S. gas prices rose to levels not found anywhere else; as a result, LNG suppliers began to find their way to the U.S. market on the strength of the gas prices at that time, particularly because existing LNG terminal capacity could be demothballed to access this increasingly attractive market.

In the past LNG was the only option for new supplies until higher gas prices and fiscal incentives stimulated unconventional gas development, such as in the Barnett Shale in Texas, which is already contributing 6 percent to total production

Figure 11-1. *Gas Supply to Three Regional Markets, by Type and Supply, 2007^a*



Source: Authors' analysis, based on International Energy Agency (2008a).
 a. Totals may not add up due to rounding.

in the lower forty-eight states.¹ As a result of the ongoing economic downturn and the success of unconventional gas production, however, prices are lower in the U.S. market than in most other markets. Nevertheless, in view of its depth and liquidity, this market remains a major outlet for possible LNG surpluses. Gas prices in this market will be set essentially by competition between LNG and unconventional gas production in the years to come.

ASIAN MARKETS

Gas consumption in the Asian markets was around 420 billion cubic meters in 2007.² While a few large producing countries in Southeast Asia (for example, Indonesia and Malaysia) are self-sufficient in gas supplies, others, such as China and India, which were self-sufficient until the turn of the century, now need to import gas. China is looking for reliable supplies available through long-term contracts, so as to establish a robust supply base. India, on the other hand, has thus far relied more on short-term and flexible trade.

1. International Energy Agency (2008b), p. 292.

2. Asia is defined as all Asian countries excluding Turkey, and the Asian countries in the Middle East and in the Commonwealth of Independent States.

In contrast to markets in Europe and the United States, Asian LNG-importing countries are not interconnected with gas pipelines from outside the region (although the potential exists), rendering LNG the only source of their gas imports (see figure 11-1). The share of LNG in the total gas consumption in Asian LNG-importing countries is 60 percent.³ Given this import dependence, the main Asian markets can be expected to stick with traditional long-term contracts (despite the availability of short-term supplies).

EUROPEAN MARKETS

European energy markets are undergoing major restructuring, enforced by directives aimed at lowering the barriers to entry, enhancing competition, and integrating national markets into a single European gas market.⁴

Europe relies mainly on pipeline gas, importing roughly 85 percent of its needs via pipeline from three main suppliers: Norway (which in 2007 supplied 88 billion cubic meters of gas to the United Kingdom and northwest continental Europe); Algeria (which in 2007 supplied 27 billion cubic meters of pipeline gas to the Iberian peninsula and Italy); and Russia (which in 2007 supplied 156 billion cubic meters of gas to northern, central, and southern Europe).⁵ While LNG, mainly from Algeria and Nigeria, has made a contribution to the European gas supply for some time (representing 9 percent of total gas consumption), LNG accounts for only 15 percent of gas imports. However, this share is growing (figure 11-1).

Both pipeline gas and LNG are supplied mainly through long-term contracts, with prices indexed to oil products. Yet European markets are changing, driven by the goal of the European Union to create an internal market and to facilitate spot markets. (The U.K. market, with its self-sufficiency in the 1990s, led the way in this respect.) These spot markets operate alongside the traditional LNG and pipeline gas market; consequently, Europe is faced with a hybrid pricing structure: spot prices for a small proportion of its wholesale market and oil-indexed prices for the rest. While pipeline gas will continue to form the backbone of gas supplies to Europe, there is a greater interest in LNG than before, and European market players have joined the trade in short-term LNG.

3. LNG-importing countries are Japan, South Korea, Taiwan, India, and China.

4. Europe and the European gas market include EU member states, Balkan non-EU member states, Norway, Switzerland, and Turkey. They exclude countries of the Commonwealth of Independent States. See also figure 11-3.

5. Clingendael International Energy Programme (2008).

Government Control of the Gas Industry

Recent changes in the geopolitical and geoeconomic balance of power have affected the conditions under which gas (and oil) will be produced and traded in the foreseeable future, both globally but especially in Europe and Asia.

The thinking in the 1990s—that international oil and gas markets would be increasingly free of government involvement and management and that governments would limit their role to market regulator and tax collector—has evaporated in recent years. Instead, governments in producing countries are asserting control and management over their energy resources and economic rents through (majority) ownership. Consumer governments are also increasing their control over their energy sectors again, despite the liberalization and privatization processes of the 1990s. They are regulating markets within the constraints of their public interests (environmental effects and supply security), and they are subsidizing new energy sources and taxing the energy sector, thus limiting the space for competitive forces to work.⁶ At the heart of all government intervention in the energy sector is the distribution of risks and benefits throughout the energy resource value chain in the short and long term; these policies are often termed security of supply and security of demand.

The explanation for the more interventionist energy policies can be found in a paradigm shift in international oil and gas markets, from a long period of ample supplies, during which production capacities grew faster than demand, to world oil and gas markets that were, until autumn 2008, much tighter. In these years demand grew much faster than supply, and overcapacity in the oil and gas industries disappeared, reducing flexibility in the value chain. In the gas market the excitement over the increasing availability of LNG—with the unlocking of the substantial but previously stranded reserves of the Middle East—quickly dampened when it became clear that demand would outpace supply and that the much-heralded flexibility to supply markets would remain limited for some time to come.⁷ However, in the next few years gas demand will be affected by the economic crisis and the success of unconventional gas production in the United States; supply will be affected by the deferring of investments.

In energy, the long lead times between discovery and production, the capital intensity of certain parts of the value chain, the inflexibility of transportation (particularly in gas and coal), the dedicated investment requirements, and the large

6. In the EU, the European Commission is also attempting to break up the value chain by ownership unbundling. Conversely, a large number of EU member states oppose unbundling.

7. Dutch Energy Council (2005), p. 54.

economic rents create market imperfections along the value chain and in the various submarkets. These imperfections create significant risks for market players. Moreover, the impact of these investments on national economies and supply security remains considerable in both producing and consuming countries. Consequently, the role of government is crucial in a market-based system, in a mixed economic system, and in a state-oriented economic system. In all of these systems, governments go beyond their role as regulator, market model designer, or even prime owner of energy assets.

Governments also play a vital role in shaping the investment climate, which is important for the very capital-intensive energy industry. Governments are also responsible not only for macroeconomic and monetary stability but also, as owners of the subsurface, for issuing permits to explore, produce, transport, transit, and distribute energy. They also have a role as tax collector, laying claim to both profits and the large economic rents from energy resources. In addition, public interests such as the environment and security of supply are matters best addressed through government policies.

It is therefore unthinkable that government would not be involved in the energy sector or that it would allow the industry to be governed by market behavior or self-regulation. The potential benefits from capturing economic rents, the impact on the balance of trade (and payments), and the social and political stakes are simply too high for any government to leave the industry to self-regulate. At the same time, the value chains in energy are often not limited to a single jurisdiction, which not only complicates the choice of regulatory regime but also may thwart capturing the full benefits from the energy sector. Multiple jurisdictions even make public benefits, such as security of supply and protection of the environment, harder to obtain. It is in this sphere that security of supply, transit, and demand may introduce strategic political interests into the decisionmaking.

GECF: Risk Management by Producing Countries?

The members of the Gas Exporting Countries Forum (GECF) represent a very large part of world gas reserves (more than 70 percent) and are responsible for around 45 percent of total world production and around 90 percent of global LNG trade.⁸ The initial assessment that the cartelization of the gas market would be difficult is being challenged by recent developments in the market behavior of the main suppliers.⁹ A certain coordination of investments and orientation in specific

8. British Petroleum (2008).

9. Hadouche (2006).

markets can be imagined. Producer governments are reconsidering their export strategies and are beginning to focus on supply management as a means of ensuring value protection for their resources. They also prioritize the use of gas for growth in their domestic economies. Moreover, they control most world reserves of oil and gas through their national oil companies.

Both pipeline gas and LNG are capital intense and expensive businesses. Producing countries may want to protect their investments by not oversizing their industry and coordinating capacity extensions in order to realize better returns on invested capital. The strength of the organization will be proven when the international gas market weakens, prices fall below their competitive value, and the members feel compelled to intervene in the market.

LNG Markets

The emergence of a few significant LNG suppliers, such as Qatar, has contributed to the making of a truly global gas market. The business models in LNG and piped gas are changing, and this changing nature of the business is likely to affect the European gas market, which is characterized by long-term supply and purchase agreements.

LNG Expansion: From the Atlantic Basin to World Markets

The size of the LNG market increased between 1996 and 2006 by almost 8 percent a year (in 2006 global LNG demand was more than 200 billion cubic meters), with Japan, Europe, and South Korea the most significant markets for LNG.¹⁰ Higher gas prices have produced more candidates for LNG production in locations with gas reserves, locations hitherto considered stranded, particularly those in the Middle East. Consequently, more LNG projects have been announced and more LNG has been offered to international gas markets. Therefore LNG is expected to account for an increasing share of the international gas trade.

LNG is an attractive alternative to pipeline gas, as it offers supply diversity and few transit complications. These attributes have created a strong interest in LNG by markets in Europe. Furthermore, LNG markets are developing in not only the United States and South America but also in the fast-growing developing economies of China and India. On the supply side, traditional LNG suppliers—

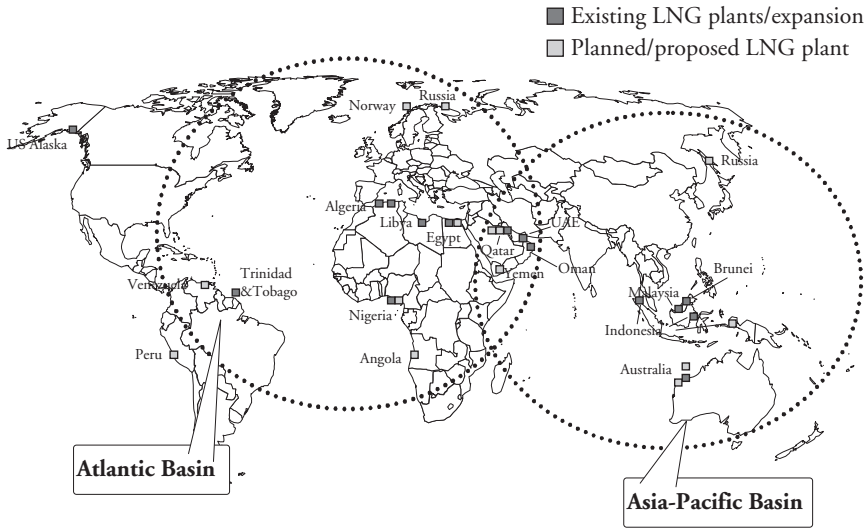
10. Clingendael International Energy Programme (2008).

Indonesia, Australia, Malaysia, Algeria—have been joined by other countries with major gas resources, such as Qatar (which displaced Indonesia as the biggest LNG exporter in 2006), Nigeria, Egypt, and Equatorial Guinea.

The globalization of LNG trade developed in two distinct stages and did not begin until after 2000. Initially, LNG trade was concentrated in the Atlantic Basin and the Asia-Pacific Basin; the connection between these two regional markets is a recent development. There were instances of other business transactions, at times leading to much-quoted examples of movements of LNG cargoes around the world, but these were essentially one-off deals. In the Atlantic Basin, with the developing appetite of the U.S. market for LNG, arbitrage grew. Only a few years ago, U.S. gas prices rose to levels not found anywhere else. This led initially to the diversion of LNG cargoes destined for European markets; subsequently, new LNG supplies were earmarked for but not committed to the U.S. market. While U.S. gas prices have fallen due to the development of unconventional gas, and more recently also due to the economic downturn, it is likely that much of this gas will now find its way to European markets until such time as U.S. prices make the market attractive for suppliers.

The emergence of Qatar as the most significant LNG supplier has made the gas market global, as mentioned. Qatar's geographic position makes it possible to supply both the European and the Asian markets at similar costs, while the U.S. market is also within competitive reach (figure 11-2). Both European and Asian markets are interested in acquiring LNG from Qatar, while Qatar producers also are interested in preserving the option to supply the U.S. market.

Yet the pace and potential of LNG development has been slowed by limited human and material resources for project construction, by the increasing complexity of LNG projects, and by geopolitical factors. A sellers' market for new LNG developments has been the result. Under various business-as-usual scenarios, the sellers' market is likely to come back. Ironically, the shorter-term outlook for LNG is one of abundance. Many large LNG projects (such as those in Qatar and Nigeria) are coming onstream in 2009–10, with much of them falling into the category of flexible LNG and mostly earmarked for Europe and the United States. However, U.S. demand for gas imports has dropped as a result of the surge in development of unconventional gas. In addition, in both the United States and Europe the recession has started to make an impact on demand. Some of the new flexible LNG has already been diverted to Asian markets, a region also showing less appetite for the product in the light of the economic slowdown. Hence, flexible LNG is likely to become a truly global commodity, looking for markets where it can realize the best netback value.

Figure 11-2. *Atlantic and Asia-Pacific LNG Trading Basins*^a

Source: Based on Wood MacKenzie, unpublished data.

a. Figure does not include all (planned) LNG plants.

New LNG Business Models but Not (Yet) a Global LNG Market

The market is not the only part of the industry that is changing; business models for the gas business (both LNG and pipeline) are also experiencing major changes. The traditional model was based on long-term contracts between producers and buyers in Asia and Europe. A number of LNG producers—notably those aiming for the liberalized markets of the Atlantic Basin—moved away from this model. They were driven mainly by arbitrage opportunities, the opening of the U.S. market for LNG, high gas prices, and a sellers' market.

To realize the value of arbitrage opportunities, LNG producers moved to business models offering more flexibility of supply. However, the financing and in many cases the corporate structures of LNG ventures generally require the security of long-term offtake contracts. The high gas prices of recent years allowed LNG producers to finance investments in new production with far less than the total capacity locked into long-term supply contracts. Also, to create a bridge between the need for security through long-term offtake contracts and the prospects of greater gains from flexible supplies, financially strong producers bought (their own production) LNG under long-term contracts in order to dispose of it as they saw

fit, either in the form of LNG to buyers under short- or medium-term contracts or by taking the LNG to a (liberalized) market, regasifying it, and selling it in the markets. The Qatargas/ExxonMobil development of two trains of LNG, 7.8 million tonnes a year each and earmarked for the U.K. market, is an example of self-contracting by producers. It was announced as the world's first fully integrated value chain LNG venture. Another new phenomenon is the third-party aggregator, which acquires a portfolio of LNG, purchased under long-term contracts from different sources and sold at different terms in a variety of markets.

The downside of the new business models are higher risks related to both revenue and volume. The change from a sellers' market to a buyers' market may make short-term and spot gas prices less attractive than those realized under long-term contracts. It may even prove difficult to place LNG in traditional markets. For these reasons, self-contracting producers and aggregators often develop at least one haven of last resort for their LNG, in the form of regasification capacity with access to a liquid market. In many cases this lies in the United States, the most liquid market, with the most capacity to absorb surplus LNG even in an oversupplied global market, albeit at potentially very low gas prices.

The consequences of self-contracting and other forms of flexible LNG are considerable not only for producers but also for markets. To realize the potential of arbitrage, producers need regasification capacity in different markets and need sufficient shipping capacity to reach all markets that can be included in their arbitration portfolio. In addition, without long-term supply contracts for flexible gas, producers need to have the physical capacity to sell gas directly in markets of their choice: shipping capacity capable of reaching any market and access to regasification terminals in different markets. This is likely to lead to chronic surpluses in shipping and regasification capacity.

Until recently it was widely expected that the percentage of flexible LNG in the market as a whole would rise. In the tight market for LNG of the past few years, the downside risks were considered to be relatively small. However, current international economic problems and the resulting low spot prices for gas in the main liberalized markets could increase these risks substantially and could (maybe temporarily) raise the appetite of producers for traditional long-term commitments with market parties. Estimates of flexible LNG trade in the Atlantic Basin have been 40 percent of total trade. That was before the economic downturn. The share of flexible LNG in the Asian market was expected to be considerably lower, as its markets remain focused on long-term supply agreements (with some spot purchases on the side). It is too early to judge whether the higher costs of creating flexibility are justified by higher income for producers

over a period of time. The fall in U.S. and European spot prices has certainly changed estimates.

Meanwhile, as long as the lion's share of LNG continues to be sold under long-term contracts, a truly global LNG market will not develop (that is, if such a market is characterized by liquidity and short-term trade).

Effect of New Business Models on Regional Markets

Growing volumes of flexible LNG will come into production over the next few years. This LNG will respond mainly to price signals, although politics and customer relations could also play a role in its final destination.¹¹

The U.S. market expects its purchase of LNG to vary, depending on price. LNG is a marginal U.S. source and a price taker in this market. Flexible LNG will enhance available LNG at times of high demand. Due to the development of shale gas in the United States (stepped up before the economic crisis), the import needs of the U.S. gas market have been substantially reduced. U.S. gas prices (Henry Hub) are now the lowest of the three regional markets.¹² Shale gas production could be large, but its cost would also be large. The long-term outlook for the United States is that shale gas and LNG will be in competition with each other.

Asian markets, with only few pipeline import alternatives, rely nearly fully on LNG for their gas supply. Long-term contracts remain the basis of business between buyers and sellers. While this region offered the highest spot prices for LNG in 2008, in the current economic climate the conclusion of new long-term contracts is slowing down, with China the only remaining interested buyer. However, since the Asian market has significant potential for economic growth and corresponding growth in demand for energy, following the recovery of the global economy, this market may well be a significant buyer of Middle Eastern LNG (even though LNG must compete with possible pipeline imports and indigenous production).

European markets have been most affected by the new business models and the global competition for LNG. For quite a few years Europe's markets have been

11. Pipeline suppliers to the European market, notably those from Russia, Norway, and Algeria, also appear to add flexible supplies. These are supplies not committed to their markets by means of long-term contracts and are in their supply portfolio for Europe for purposes of direct marketing and sales in the wholesale spot market. For Gazprom, another driver may be the need to maintain more optionality in its supply position, given the potential domestic demand (even though it has recently fallen markedly).

12. See Energy Information Administration (2008). Under the influence of high prices, U.S. gas production in 2008 was up 9 percent, mainly due to unconventional gas and deep offshore gas, which more than compensated for falling production in the shallow part of the Gulf of Mexico. International Energy Agency (2008), p. 292.

unable to secure new supplies of LNG under long-term contracts. First U.S. gas prices worked as a magnet to new LNG production, then the demand of the Asian market attracted the attention of LNG producers in the Middle East and Asia. Moreover, LNG producers required the physical availability of LNG regasification terminals as a precondition for doing business. As a result, interested European LNG buyers have been making speculative investments in regasification capacity without having acquired the necessary LNG supplies. These investments create more financial exposure for this market. The ability of Europe to acquire LNG under long-term contracts, thereby preserving security of supply, has been affected.

Europe and Global Competition for LNG

Its complex supply portfolio of indigenous gas production, pipeline gas, and LNG imports, and an unfinished institutional framework, makes Europe an interesting case for discussion. Its outlook for gas demand and supply is more uncertain than ever. Making forecasts would be a risky business today and could create a false impression of factual insights on future developments. There are in fact very few certainties left for Europe.

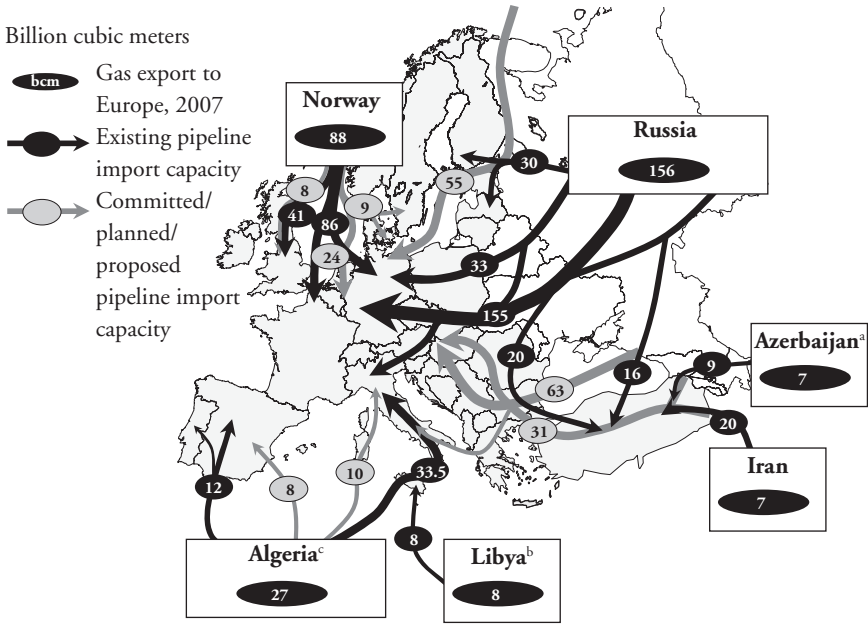
First, while it is broadly assumed that there will be growth in European gas demand, the amount of growth is highly uncertain (even a prolonged period of static demand is not entirely unthinkable). Second, although Europe will need to import more gas than it does today,¹³ given the recession it is uncertain when that will be, where the gas will be coming from, and at what prices. Last, business models of gas suppliers have been changing, which will affect security of supply. It is therefore prudent to measure future challenges against different perspectives on the attractiveness of LNG for Europe, and vice versa. We particularly focus on challenges that will stem from tight supply conditions, as it is probable that these will return after the current LNG glut.

Outlook for European Supply

European demand for gas relies on substantial imports through pipelines from Norway, Algeria, and Russia (figure 11-3). With increasing import dependency, the need for more diversified gas flows (pipeline and LNG) will also grow. New possibilities are being explored and encouraged to increase existing supplies and to complement them with supplies from Central Asia and the

13. Commission of the European Communities (2007).

Figure 11-3. *Gas Pipelines and Supplies to Europe, 2007*



Source: Clingendael International Energy Programme (2008); authors' adaptations.

Note: Converted to European bcm (billion cubic meters).

a. Azerbaijan data are from 2006; the contract is not solid. The South Caucasus pipeline could be extended to 16 billion cubic meters a year in 2012.

b. Libya's greenstream could be increased to 11 billion cubic meters a year.

c. Algeria's total excluded LNG supply to Europe.

Middle East. When East Siberian reserves are developed, pipeline supplies and LNG both will have a role to play. Europe's greater import dependence will affect the mechanisms of supply risk management in a changing LNG and pipeline market.

Even though Europe is geographically well positioned for new (pipeline) supplies, surrounded as it is by the majority of global gas reserves, not many major supply developments ongoing in producing countries (other than Russia) are earmarked for Europe's markets (figure 11-3). To be sure, logistically and geographically, Russia is the most obvious supplier for Europe's growing gas demand. But realizing more supplies from this country other than those already committed is not a foregone conclusion. Russia and other possible pipeline suppliers to Europe are also looking to diversify their export markets, notably the fast-growing devel-

oping economies in Asia. Although the global economic downturn could delay some of these projects, gas pipeline producers want to diversify: Russia has announced pipeline projects that connect the inland basin in East Siberia with South Korea and Northeast China. Turkmenistan is constructing a pipeline system to China and has proposed a pipeline project from its gas fields to Pakistan and India. Iran has proposed plans for exporting gas to this region as well.

In this light, and in view of the commercial and political objective of the markets to diversify its supply sources, European stakeholders have given much attention to LNG and the role that it could play in supplying European markets. As mentioned above, about 15 percent of European gas imports consist of LNG, while 85 percent is imported through pipelines. The share of LNG is, however, growing, and new supplies are expected. The volume of LNG is unevenly distributed, however, as are suppliers. With the expansion of regasification capacity in the northwest European market, the share of LNG may also rise in this region. However, Europe will be in competition with the rest of the world for any additional LNG supplies.

The question of increasingly diversified imported gas flows has not only geo-economic dimensions but also geopolitical ones, because the role of government in the gas sector is significant. International long-term business-to-business contracts, including LNG contracts, require a substantial contribution from government-to-government relations. While many importing countries have privatized the gas sector, exporting countries' governments have increasingly taken a direct interest in their gas export business. The quest of consuming markets to attract diversified gas flows cannot be separated from the framework of the dominating political and economic order of the producing country; it becomes the context in which these gas flows are realized.¹⁴

The current economic crisis will also affect the development of the European gas market, particularly in the electric power segment of the market. It is likely that certain investment plans will be delayed or scrapped as the demand outlook remains uncertain. At least temporarily, the competitive position of gas in this segment of the market, with its lower capital costs and shorter lead times for new generating capacity compared to other fossil fuels, might be strengthened. In addition, the large rescue operation by national governments of their financial sectors may reduce stimulation of the market for sustainable energy.

14. Clingendael International Energy Programme (2004); Van der Linde (2005); Hoogveen and Perlot (2005).

Yet declining economic activity might also reduce demand for energy in general and also negatively affect demand for gas. Many large investment projects in producing countries that were about to gather pace could be reexamined. These include projects to unlock the vast reserves in Shtokman and Yamal and pipeline projects like Nabucco and South Stream. What is certain is that a period of expansionary growth has come to an end and that earlier predictions about demand levels and prices will be pushed into the future. Whether the current economic downswing is strong enough and long enough to produce a prolonged switch from a sellers' to a buyers' market is unclear, because ownership at the upstream part of the value chain allows for more production management than before. Much will also depend on how growth of gas demand in the fast-growth markets of Asia will be affected by the economic downturn.

Attractiveness of LNG for Europe

The attractiveness of LNG for Europe lies mainly in LNG's potential to add diversity and thus security to supply. Traditional long-term supply contracts with European buyers already offer diversification and security of supply, but flexible LNG could improve security of supply by helping to accommodate seasonal shortages. Thus LNG could make a positive, but for flexible LNG uncertain, contribution to security of supply.

Conversely, there is a risk that the European market will rely on flexible LNG to make up for seasonal and other shortages at the expense of further investments in underground storage. This could lead to a reduction in Europe's short-term supply security. Therefore, since Europe cannot count on flexible LNG to be available to provide gas security, it is recommended that Europe make sure that there are no avoidable barriers to the development of underground storage, which will be a more secure and probably more cost-effective way of creating the necessary flexibility in the market. Further analysis is needed to establish the relationship between the costs and opportunities for LNG to contribute in a secure manner to flexibility and the use of underground storage.

Even though flexible LNG may reduce the effect of a disruption of pipeline gas supply, it is important to realize that LNG can also suffer supply disruptions and is in certain aspects more vulnerable to geopolitical tension than pipeline gas. Provided that regasification and shipping capacity are available, flexible LNG can alleviate the effect of disruptions or higher winter demand in Europe but at a price topping other markets and provided there are no other political obstacles. Given increasing global competition for LNG, there will be no certainty that short-term LNG will be available when needed.

In today's market there is no clear optimal balance between LNG and pipeline gas. Instead, given the current dynamics of the market, Europe should be aiming at being the attractive outlet for both pipeline gas and LNG. Pipeline supplies should continue to form the basis of Europe's gas supply, while LNG offers a prospect of new supplies and supply diversification. Flexible LNG can also make a contribution to short-term supply security but not one that the market can count on.

Attractiveness of Europe for LNG Producers

In a sellers' market producers will be looking closely at Europe's attractiveness as a consumer market, compared to Asia and North America. Continued regulatory uncertainties in the European market may undermine efforts to attract long-term LNG supplies. Furthermore, relatively tight regulation hinders buyers in their negotiations with suppliers, as it reduces the flexibility necessary to develop win-win opportunities.

Price uncertainty is another issue. For buyers in the Continental market, a major long-term LNG contract with other than oil-related price indexes creates significant price exposure in a market dominated by oil-indexed prices. LNG producers have a choice of markets and of prices. Given the current price setting of (mainly pipeline) gas in Europe and price levels for long-term LNG in Asia, it is not certain that Europe will be able to out-compete Asia-Pacific buyers on price in a sellers' market.

The uncertainty of future European demand for gas further compromises Europe's attractiveness. Growth will be determined by many factors, whose eventual effect is hard to establish. These uncertainties are felt not just with regard to Europe but universally, albeit to different extents. For Europe, demand uncertainty is compounded by the strong position of Gazprom as a supplier of gas and by questions regarding future incremental pipeline supplies to Europe. Producers of LNG, looking for security of demand, will not draw much comfort from the European outlook unless they are protected by long-term contracts with strong buyers.

The EU as a whole is politically not a transaction partner for governments of producing countries. Instead, bilateral, country-by-country deals secure long-term LNG supplies (and government-to-government relations underpin business-to-business relations). Furthermore, European market players are traditionally active in scouting for new supplies and in creating the conditions for new supplies. These initiatives should be useful in a sellers' market. However, European markets face similar competition from Asian markets, which have also shown their ability to

secure supplies in this manner. Moreover, LNG regasification terminal capacity is currently expanding, confirming the appetite of European markets for LNG. However, if new LNG flows fail to enter European markets, the regasification expansion would imply a cost burden to market players. A slowdown in the construction of new regasification capacity can be expected as an investor's response to new market circumstances.

Europe and the LNG Bubble

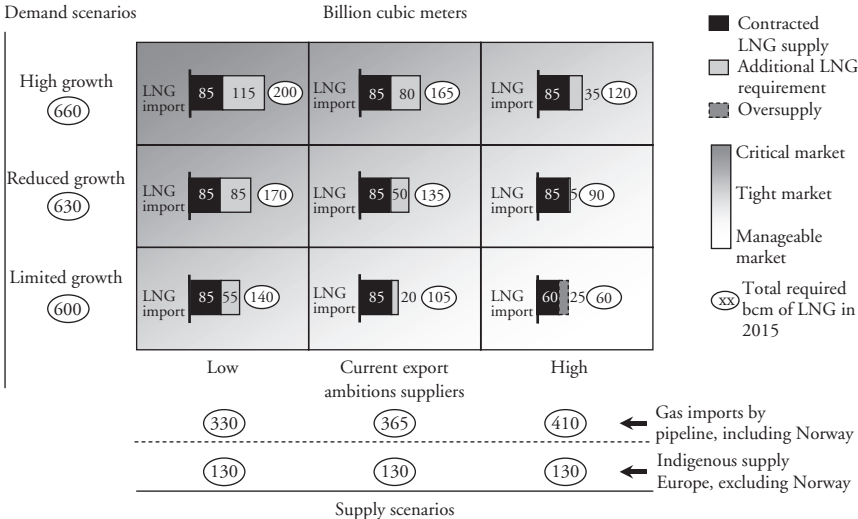
A surge of new LNG production will become available in 2009–10. Some commitments for this LNG were made in 2005–06, at the time of high gas prices and high demand, but much of this gas is flexible. It was widely expected at the time that most of this LNG would find its way to the United States. In fact U.S. demand is lower than anticipated, resulting from the success of unconventional production.

After 2006 very few new LNG projects were brought to a final investment decision. The lack of new investment in LNG is a matter of concern. The situation is compounded by reduced demand in all main gas markets. Spot prices have nosedived in the liberalized markets. LNG under contracts to markets will still find its way to buyers in these markets (although these buyers may well use contractual flexibility to minimize their commitment). This situation leaves flexible LNG virtually stranded, looking for markets. Prices for flexible LNG could be very low indeed, in any case below prices for gas under long-term contracts to Europe and Asia. Europe may well seek to benefit from this glut in LNG and the overcapacity of its regasification terminals: where demand permits, European buyers may reduce their contractual minimums and purchase flexible LNG instead.

Scenarios for 2015

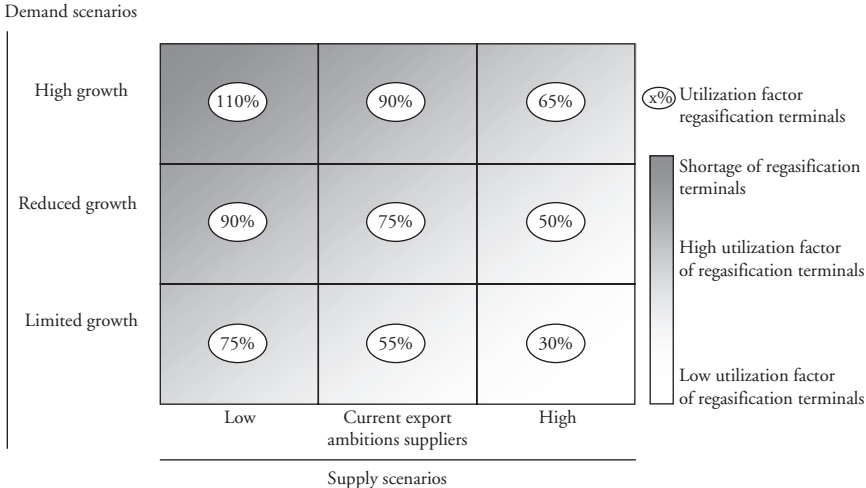
Nine LNG scenarios for European markets in 2015 arise from combining three demand scenarios and three supply scenarios for pipeline gas (figure 11-4) and the utilization factor of regasification terminals in Europe (figure 11-5). The scenarios are based on the assumption that the LNG glut will have been absorbed by 2015. With the additional premise that LNG will balance European supply and demand after pipeline gas has found its way to the market, the contribution of LNG to European markets could vary considerably, from around the current supply to levels well above the capacity of LNG regasification terminals. The scenarios also suggest that LNG demand of around 100 billion cubic meters could probably be accommodated under manageable pricing and supply conditions and would offer European markets a reasonable balance between pipeline gas and

Figure 11-4. Call on LNG Imports, Nine Scenarios of European Pipeline Gas Demand and Supply, 2015



Source: Clingendael International Energy Programme (2008); updated in February 2009 by the authors.

Figure 11-5. Utilization Factor of Regasification Terminals in Europe, Nine Scenarios of European Pipeline Gas Demand and Supply, 2015^a



Source: Clingendael International Energy Programme (2008); updated in February 2009 by the authors.
 a. Regasification capacity in 2015 assumed to be 185 billion cubic meters.

LNG. However, European demand for LNG, combined with strong demand for LNG from other regions, could total well above global LNG production capacity. In the latter situation, high demand for LNG in Europe could lead not only to higher spot prices for LNG but also to higher than current prices for both pipeline gas and LNG under long-term contracts in Europe.

Current contracted LNG supplies to Europe are in the order of 85 billion cubic meters a year. It should be noted, however, that some of these supplies are flexible LNG, notably self-contracted supplies from Qatar to the United Kingdom; or they contain elements of flexibility, which means they can still be diverted to other markets.

Spreading the Risks in LNG Investments

The risk future in LNG looks very different from the past and involves security of supply and security of demand. In this light it is not surprising that governments of many producing and consuming countries are taking more interest in and control over gas supplies.

Producers and Producing Countries

Producing governments may be facing a dilemma. While many of them are inclined to seal commercial supply transactions with a government-to-government understanding, this can only be achieved through traditional long-term contracts from a producing country to a particular market. Flexible LNG does not fit that model. In a global environment with major price differentials between regions, as has been the case in recent years, producer governments may not want to miss opportunities to acquire the highest possible rent for their resource. But to achieve that, producing governments have to accept that flexible LNG may switch from one market to another in order to realize a higher value for the commodity and, therefore, cannot be committed to one customer.

The choice for these governments lies between repeated short-term value optimization through destination flexibility and political destination management. Value optimization through arbitration thus comes at a cost for producers (and producing governments) of less or no government-to-government support for the major investments associated with LNG projects. It also comes at higher costs, particularly the need to own regasification and shipping capacity in the various markets, more than would be necessary in a single long-term transaction with one buyer.

A lower risk variation on the theme of self-contracting is for a producer to sell to one buyer under a long-term agreement, which allows for occasional selling of cargoes to third parties offering higher value. This generally requires the consent of both parties to the long-term contract and is constructed to create win-win conditions for both.

A further consequence of flexible LNG (and pipeline gas), notably the type based on self-contracting by producers, is that owning the capacity to land LNG on the beach of a market may not be enough for a producer to realize the full value of the commodity, particularly at times of a buyers' market or in a market with limited liquidity. In such a market the producer also needs to understand the market to be able to secure the full rent for his gas. Therefore, increasingly LNG (and pipeline gas) producers are taking positions in markets to allow them to dispose of their gas at a satisfactory value.

Consumer Markets

The three major consumer markets for gas are Asian markets, the U.S. market, and European markets. The LNG industry is here explored from their perspectives.

ASIAN MARKETS

Given their strong dependence on LNG supplies for their energy economies, the main Asian markets are likely to continue to look for firm long-term LNG supply commitments from their suppliers, although they were greatly helped by the existence of flexible LNG at times of shortages, such as when nuclear power stations were out of operation in Japan. In the sellers' market up to the autumn of 2008 producers have been able to dictate their terms, and some flexibility may have crept into some contracts. However, as long as Asian buyers can manage to acquire LNG on traditional terms, supply risks for their markets will not change significantly, and the risk profiles of the business will not materially change.

THE U.S. MARKET

The supply risks for the U.S. market will be positively affected by the new LNG business models. There are hardly any long-term supply contracts with U.S. buyers. Given the structure of this market, it is helped by the availability of flexible LNG, which will find a way to the United States when its prices make this attractive. Virtually all regasification capacity in the United States is owned by (potential) LNG suppliers. As long there is sufficient LNG landing capacity, and as long as most of this regasification terminal capacity is in the hands of suppliers, the

higher supply costs (of potentially underutilized regasification capacity) will be to suppliers and not to consumers.

EUROPEAN MARKETS

In recent years Europe has experienced difficulties acquiring LNG under long-term contracts. The attractiveness of LNG for European markets lies mainly in its potential to add diversity of supply. Long-term contracts contribute to long-term security of gas supply. Flexible LNG could improve short-term security of supply if it is available to accommodate seasonal shortages. But for flexible LNG, European markets may be in competition with other markets. Their structures and price levels may not allow them to outbid other markets for the marginal LNG at times of high global demand. Thus LNG could make a positive (but for flexible LNG, uncertain) contribution to security of supply, both for the long and short term.

Also in Europe it is not only LNG suppliers that have invested in regasification terminal capacity but also buyers and potential buyers (wholesale gas companies and distributors). Some of these investments have been speculative: LNG supplies were not secured at the time of the commitment. Also it is generally expected that in Europe in the medium to longer term the LNG regasification capacity will be underutilized. This has raised the cost of doing business for these gas market players, while the contribution to their security of supply remains uncertain. This uncertainty confirms the need to ensure that pipeline supplies remain secured for European markets and the need to evaluate other options to enhance supply security for Europe.

Gas Supply Risk Management for Europe

The EU member states have always been comfortable with the arrangements in the International Energy Agency (IEA) for oil security and crisis management, due to the limited political and strategic role of the EU in securing oil flows but also due to the intergovernmental character of this cooperation. The coalition on oil crisis management has been a great benefit to EU countries. Although the benefits of the IEA go undisputed, the U.S. policy in Iraq guaranteeing oil flows in the future did create unease among European countries and led them to shore up their national or regional efforts. The call for one voice in external European energy affairs exemplifies this position.

The IEA does not have competency in the field of gas, nor is there a crisis mechanism at this level. The EU security mechanism (2004 directive, possibly replaced when a recent regulation proposal is adopted) is just a first step for this group of

countries. The gas sector is vulnerable to disruptions. In addition, gas security of supply is mainly an EU member-state issue, perhaps explaining the bilateral nature of many of the new long-term supply contracts involving both governments and companies.¹⁵ For most EU member states, diversification of gas supplies is an important instrument, as it enhances both security and, in many cases, competitiveness. For a small group of European countries, LNG makes a valuable contribution in this respect.

The answer to enhancing security of supply in these markets may not always lie in diversification of supply, accommodating other gas supplies in markets where they would otherwise be uncompetitive (as is done in Spain, where competitive LNG supplies offer alternatives to Algerian gas supplies). Instead, the lack of diversified gas supplies may be more economically dealt with by diversifying the energy mix and enhancing regional cooperation on energy with neighboring states, allowing these countries to tap into their neighbors' fuel mix distribution or tying their gas markets to the interests of other parts of the European gas market.

Based on the successful strategy of economic integration, European companies could integrate their activities along the value chain with upstream companies, and vice versa. The idea behind this strategy is that—with intertwined economic or energy interests, or interdependency—both producers and consumers have a vested interest in maintaining good economic relations. At the same time, such ventures work toward securing additional supply and demand between producers and consumers.

In the case of Russia and Europe, such interdependency is an important disciplining force. For smaller countries or for markets dependent on Russian supplies, becoming part of the larger Europe-Russia relationship can provide them with the security that a bilateral relationship cannot. When alternative gas flows are not a commercial option to reduce gas dependency on the one dominant supplier, mixing economic interests within the infrastructure and in markets with other upstream and downstream players could reduce exposure to risk or abuse of market power. The competition policy of European markets, and particularly their measures against the abuse of market power, can discipline the market behavior of the players in that part of the internal market, while a crisis mechanism could increase those countries' safety.

The recent expansion of the LNG sector in European markets and the prospect of more LNG penetrating the market could offer the prospect of diversifying gas flows, but this impact should not be overstated. LNG flows have their own

15. Van der Linde (2005, 2008).

rigidities, and competition for LNG, particularly in a tight supply market, could reduce the impact on Europe's pipeline flows. Moreover, Russia and other traditional suppliers are preparing new strategies to defend their market share.

Conclusion

Higher prices and the new sources of LNG supply, particularly from the Middle East, have created a global environment for the LNG industry. New models, particularly flexible LNG, are contributing further to the globalization of the LNG business. Whether this trend will continue depends largely on whether this new way of conducting business continues. It will be tested during the coming years, in the face of lower margins, lower spot prices (than under long-term contracts), uncertain demand, and stricter financing requirements. (Conversely, the LNG glut may also put pressure on the conditions of existing and new long-term contracts, notably gas prices.)

From the geopolitical perspective, the outlook also depends on the role of producing governments: whether they exercise control over the development of their resources and their destination and whether they are able to carry the risks associated with this model. Risks of doing business have risen for those producers that self-contract their supplies. One of the consequences is that they will be taking positions in the markets to control the full value chain and to acquire the fullest rent for their commodity.

Based on the netback pricing mechanisms in Europe's long-term pipeline supplies, European gas prices have been lower than those of Asia, which relies nearly completely on LNG. While this benefits the European consumer, it does not help the European position as a potential outlet for LNG under long-term contracts in a competitive global market. Over the short term there will be oversupply and uncertainty. Thereafter, the sellers' market of the last five years may well return. In such a market there will be global competition for gas among the three world market regions. This implies the need to refocus European policies from the internal market to the external market. The current internal market design is of value in a buyers' market with an abundance of supply. In a sellers' market a successful energy policy depends on obtaining competitive supplies from outside Europe.¹⁶

Price competition in the gas market takes place for the most part in the international market. Designers of the European gas market should take this into account, because while focusing on redesigning internal market dynamics, they

16. The EU has commissioned a feasibility study on the acquisition of gas from the Caspian region.

may inadvertently drive up prices for consumers. Flexible LNG could play a role in alleviating shortages in Europe and lowering peak spot prices, but its availability is uncertain. While the U.S. gas market is the market of last resort at times of surpluses of LNG, in a tight LNG market the U.S. and Asian markets may well outcompete Europe for available LNG. Acquiring LNG under long-term contracts should continue to be an important objective of European markets. A structured dialogue on gas between producing countries and European markets could make a significant contribution to lowering barriers to entry.

Given its geographical position, Europe is essentially a market for pipeline gas. In the future, new possibilities should be explored and encouraged so as to complement this supply with pipeline gas from Central Asia and LNG from the Middle East. The importance of pipeline gas also has consequences for Europe's external energy policy. Recent difficulties with Russia and the differences of opinion among EU member states on how to manage this relationship affect all links in the gas value chain. Investments along the gas value chain can be delayed if the current uncertainties are not resolved, including those about transit risks. Although LNG certainly cannot cover the possible large volumes of imports Europe needs in the next decades, a stable relationship with gas-exporting countries, in which the needs for security of supply and demand are met, can contribute greatly to Europe's competitive position.

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