

## BACKGROUND

At the 11th IEF Ministerial (Rome, April 2008), Ministers noted the growing reliance of consuming countries on natural gas and the emerging trend toward globalization in the gas market and encouraged the IEF Secretariat to work with other relevant international organizations to address the key challenges facing the natural gas industry.

The IEF joined with the International Gas Union (IGU) and organized its First Ministerial Gas Forum (Vienna, November 2008). "The world gas markets going from regional to global" was the central theme. Ministers and industry leaders discussed the changing dynamics of gas markets and the key challenges that face the natural gas industry today and in the years to come.

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# FIRST IEF - IGU MINISTERIAL GAS FORUM THE TRANSITION OF WORLD GAS MARKETS FROM REGIONAL TO GLOBAL

VIENNA, 24 NOVEMBER 2008

AN IEF EVENT HELD IN COOPERATION WITH THE IGU



The International Energy Forum (IEF) is the world's largest gathering of Energy Ministers. IEF Countries account for more than 90% of global oil and gas supply and demand.

In addition to IEA and OPEC countries, transit states and key energy players, including Brazil, China, India, Mexico, Russia and South Africa, participate in the Forum. The magnitude and diversity of this engagement is a testament to the IEF's position as a neutral facilitator. Through the Forum and its associated events, IEF Ministers, their officials, energy industry executives, and other experts engage in a dialogue of increasing importance to global energy security.

The IEF and the global energy dialogue are promoted by a permanent Secretariat of international staff based in the Diplomatic Quarter of Riyadh, Saudi Arabia.

## IEF-IGU First Ministerial Gas Forum

### The World Gas Markets Going from Regional to Global

#### Background paper

##### 1- Introduction

The 11th International Energy Forum was held in Rome, 20-22 April 2008, under the central theme of 'Energy dialogue to respond to global challenges'. Among other issues of importance to the producer-consumer dialogue, the Forum noted the growing reliance of consuming countries on natural gas exports, increasing the interdependence between energy producing and energy consuming countries. The Ministers noted the emerging trend toward globalization in the gas market and encouraged the IEF Secretariat to work with other relevant international organizations to address the key challenges facing the natural gas industry.

This IEF-IGU First Ministerial Forum is an important step forward. To organize this Ministerial forum on gas we could not have thought of a more appropriate institution, IGU, the world's largest international organization for the natural gas industry with more than 100 members covering 71 countries which represent over 95 % of the gas traded in the world. IGU plays the role of the worldwide gas industry spokesman, through cooperation with governments, policy-makers and international energy-related organizations. IEF and IGU share common interest in many energy-related topics and act to promote and enhance a dialogue between natural gas producing and consuming countries.

Indeed, natural gas has become a fuel of choice in many countries. The share of natural gas in the global fuel-mix is increasing. Its 'availability', environmental qualities in the context of climate concern, economic and efficiency advantages and its expanding infrastructure are the main reasons behind this increasing importance of natural gas.

Gas reserves are sufficient to meet future demand - subject of course to adequate and timely investment to bring them to market -; they are even larger than they were 20 years ago despite two decades of increasing global consumption. The natural gas reserve to production ratio is of more than 60 years at current global demand.

The power generation sector is - and is expected to continue to be - a driving force of natural gas demand. Gas-fired power generation plants are more flexible in operation, higher in energy efficiency and more environmentally-friendly.

Plus, natural gas can combine with less flexible and less reliable renewable energies to provide optimum solutions for power generation, heating and cooling.

Clearly, natural gas demand is expected to continue growing in the future – although at a slower pace - in traditional markets and newly emerging consuming countries (Middle East, China, India) on the back of expanded infrastructure, technological innovations, and the liberalization of energy markets.

## **2- Outlook for natural gas trade in the major economies**

Natural gas consumption and trade have been growing at a rapid pace, during the last two decades. Demand for natural gas in the major economies of the world is growing on the back of new investments in the gas-fired power generation and increasing environmental concerns.

Global gas demand grew by 2.6 % per year over 1980-2006. However gas demand has been affected in recent years by increase in prices compared to coal and other fuels, rising by only 2.3 % between 2000 and 2006; and is expected to grow by only 2.1 % over 2006-2015. The power sector is the main driver of gas demand, especially in developing countries. New power stations are projected to absorb over half of the increase in gas demand over the projection period. The growth is expected to come mainly from non-OECD countries particularly the Middle East (due to ample supply availability), China and India. Middle East countries are emerging as a centre of demand growth, underlining the need to improved energy efficiency and to price reform. In Asia demand is growing rapidly, as gas is gaining market share from coal in the power generation.

Except in the OECD, global natural production is expected to expand, mainly in the Middle East, Africa and Latin America. For major OECD countries (US, EU, Japan) and emerging economies (India, China), the gap between local production and demand is widening, resulting in an increased dependence on imports. Natural gas international trades are therefore increasing faster than demand, experiencing an era of sustained growth, with inter-regional trade projected to grow from 13 % to 17 % in 2015, underlining a clear trend towards globalization in the gas market.

A growing demand in a context of market liberalization, an increasing number of buyers and sellers and new investment along the natural gas value chain, have fostered natural gas exchanges and LNG trades in particular.

Long term investment projects are planned or on the way, underlining a long term position of gas in the energy- mix.

As natural gas remains the largest used fuel for power generation, links with the electricity markets are growing in many parts of the world, natural gas-electricity convergence is increasing and many power generators are adding natural gas to their portfolio.

Advances in technology all along the natural gas value chain have served as major triggers for the development of natural gas markets; increased natural gas reserves, innovative methods in liquefaction plants, shipping and regasification. Economies of scale have also helped enhance efficiency in LNG plants and shipping by increasing the capacity.

These important changes in the gas markets brought new challenges to trade players: an increased interdependence between producing and consuming countries. Gas importing countries are increasingly dependent on import, which is one side of the coin; the other side is that exporting countries are becoming increasingly dependent on the revenues of exports. There is nothing wrong with increasing interdependence between producing and consuming countries, provided we are able to foster its potential as a cohesive factor rather than a source of tension and anxiety.

### 3 - Natural gas regional markets, main trends

The three natural gas regional markets are changing. The EU is undergoing a liberalization process, the US is becoming an important importer and in the Asian market India and China are emerging as new LNG importers. Regional gas markets become more integrated as LNG trade is expanding. Inter-regional natural gas trade is expected to grow from 435 bcm in 2006 to 588 bcm in 2015, a growth of more than 35 % over the period. Most of the increase in the exports will come from the Middle East and Africa, mainly as LNG, Russia and the Caspian being the other main exporting regions.

- (1) EU market: The European market is undergoing structural changes resulting from the liberalization process that is taking place. European gas demand has been covered mainly by pipeline gas. Decline in domestic production, increase in demand, combined with deregulation of European energy markets have created new opportunities for LNG. In 2007, LNG imports represented 13 % of total gas needs in Europe and are expected to increase to 30 % by 2015-2020.

Cross border pipelines and cross border trades have grown slowly in the EU. Gas pipeline investment is relatively low compared to North America. Several projects to expand internal cross-border capacity in Europe were announced, many proposals remain at the planning stage. An integrated gas transportation network would reinforce both security of supply and gas transport efficiency in the region.

(2) US market: The US gas market is characterized by a growing demand, an extensive pipeline grid and numerous options for transportation and trading. In 2007, US consumption grew by 6.5 % compared to 2006. This consumption was largely met from domestic sources and imported pipeline gas from Canada. US LNG imports (mostly short term contracts), although they represent only 3 % of the natural gas consumption, are in absolute term, increasing fast, they reached a record high of 22 bcm, in 2007, 32 % higher than the previous year and they are projected to grow significantly on the back of declining domestic production and expected decline of exports from Canada. The US market is open, transparent and growing and has therefore attracted in recent times a large volume of spot and short-term contract LNG from diverse exporters. 51 pipeline projects have been completed in 2007 adding 155 bcm per year of pipeline capacity, 18 % higher compared to 2006 and almost double those of 2005.

(3) Asia-Pacific market: the largest LNG importing region. Japan is the major LNG importer. LNG has been mostly traded under long-term contracts. India and China the latest new emerging LNG importers, are expected to become important LNG importers and will certainly change the dynamics of the region. An increase in the number of LNG importers in this region may create more opportunities for the spot transactions.

In the three regional markets, cross-border and inter-regional trade is expected to continue to grow, as most countries become increasingly dependent on imports, subject that the adequate investment all along the natural gas value chain, are made in a timely manner.

#### **4 - Investment**

If natural gas reserves are amply available, huge investments are needed to develop and process gas resources, transport them to market, store and finally deliver the gas to consumers. Timely and accurate investments all along the supply chain are important for the efficient and secure functioning of markets.

The most recent estimates indicate that we may need a total of \$ 4.2 trillion investment in the gas sector up to 2030. On an annual basis, this amounts to almost \$ 170 billion investment. This staggering amount of investment is needed in a context of a huge cost escalation and a shortage of skilled labour. Plus, the above mentioned projections are based on a number of assumptions surrounded by large uncertainties. The rate of economic growth in the next decade is a key factor in determining the increase of energy and gas demand. The difference in investment resulting from existing scenarios can be enormous. The IEA calculations show that in a 'high growth scenario' the needed investment in the gas sector would increase by \$ 83 billion. Energy policies and its potential impact on the global energy and gas demand is another important uncertainty when estimating investments, as different scenarios could result in substantial variations. Energy conservation and energy efficiency policies could dampen fossil fuel demand and lower gas investment by over \$ 250 billion. Deciding on future investments projects in this context is obviously highly risky, thus underlining the need for a frank and honest dialogue between producing and consuming countries on what should be done to unpack and reduce key uncertainties that hamper investment.

## 5 - LNG trades, changing dynamics

LNG trades are witnessing rapid changes, with increased volumes, new suppliers and new importers entering the markets, increased short-term and spot trade and a more transparent US market with a gas-gas competition. The LNG trade is growing and globalizing very fast, driven by improving cost competitiveness and proved record of reliability. LNG is also becoming increasingly flexible with diverse suppliers, increasing number of customers and greater market access.

During the period 1990-2006, world gas consumption grew by 42 %, world gas trade by 62 % and LNG trade by 191 %. The share of LNG trade in world gas consumption grew from less than 4 % to 7 % and its share in total gas trade grew from 14 % to 25 %.

Major expansion is underway both in liquefaction and regasification facilities. Some 80 bcm/y of liquefaction capacity is planned to be added by 2009, representing a 30 % increase and taking the global liquefaction capacity to 330 bcm/y. Another 60 bcm increase in the liquefaction capacity is projected by 2012 bringing the total capacity to close to 400 bcm. A 180 bcm is projected to be added in regasification capacity during the next two years expanding the global capacity by a third to more than 700 bcm/y.

New LNG importers are entering the market, the case of China, India and Mexico. Argentina and Brazil are expected to start receiving LNG in 2008.



Traditional LNG projects were underpinned by long-term sale and purchase contracts. More recent projects have been endorsed with new business models: upstream stakeholders purchasing and marketing output through capacity acquisition in regasification terminals or direct sales to buyers. These flexible deals are underpinning forecasts of more spot/short-term sales.

As the gas trades become more global, producers will be looking at diversifying their markets to ensure security of demand. In order to secure demand and create value, exporters are investing downstream of the gas chain value. Consumers are also diversifying their supply between different sources and also between pipeline and LNG to ensure security of supply.

With the aim of securing stable and reliable sources, international companies are developing gas reserves in various parts of the world and getting involved in downstream joint venture projects in producing countries. National companies are acting 'internationally' trying to expand into downstream markets (case of PETRONAS, Sonatrach and Qatar Petroleum). Different business models are emerging for LNG terminals.

## **6 - The world gas market, going global?**

Gas markets have been regional until recent years, but the trend is moving toward globalization with interactions becoming more common as new supply routes are developed. The expansion of LNG trades and the flexibility offered by sea transport is the main driver of this emerging globalization in the gas market. LNG-short term contracts and spot transactions are going to be more and more important. More producing and consuming countries, growing dependence on imports in major OECD countries, increasing volumes of spot and short-term LNG, encourage global interactions.

Flexible LNG (spot and short-term) played a greater role in inter-regional market balancing in 2007. Liquidity on European hubs has grown considerably; such liquidity promotes more flexible market response, more transparency and more accurate price signals. Increasing flexibility in trades and multiple routes enable wider exchanges of gas. LNG portfolio and secondary marketing strategies are increasing short-term transactions at the end of the chain.

From a straight-line-chain model LNG trade is evolving to the multiple-destination or flexible network model.

Major expansion is underway globally in regasification capacity well in excess of liquefaction capacity. This excess capacity could be a source of flexibility. As long as short-term demand continues to fluctuate in various regional markets, flexible LNG supply is expected to be diverted from one market to another depending on regional demand.



So what are the implications of a globalizing LNG sector on the global natural gas market?

Will a liquid spot market for LNG develop?

How the growing US LNG market will impact the Asia-Pacific?

How the gas pricing will develop and will the prices of the three regional markets be linked?

What are the potential impediments to the global market development?

These questions and many others related to the evolution of the gas market and the challenges it faces, will be discussed by the two panels.

But clearly, a global market is emerging, gas business is moving steadily toward open markets. It is already noticeable in the LNG industry, expanding and changing rapidly, connecting the three long-established regional markets. Grid interconnection, advances in technology, the emergence of the US as a potential major LNG importer and the entry of emerging economies such as China and India is changing the natural gas market architecture. Increasing diversity of suppliers and customers provides a flexibility that ensures gas to where it is needed when it is needed.

## 7- Increased interdependence, market transparency and enhanced dialogue

Energy security is a major issue, security of supply for consumers and security of demand for producers. Natural gas trade history has proved to provide reliability and security to both parties. The gas business depends on shared interests and mutual trust. In recent years we have seen more cross interaction between gas consumers and producers, adding interdependence between them. Natural gas exporters are entering activities in consuming countries such as receiving terminals, LNG transportation and distribution networks, while some gas importers are being involved in upstream gas field development, natural gas transportation and liquefaction plants. This cross interaction between exporters and importers guarantees security of supply for the consumer and security of demand for the producer. Plus, going beyond the buyer-seller relationship, this enables the two parties to jointly explore and develop new opportunities for partnership and cooperation and to identify potential synergies.

Natural gas trade will continue to be a major cooperation vector, securing long term dialogue between producers and consumers, focusing on practical ways to develop concrete actions, in particular in the areas of improving the transparency in oil and gas markets and investments framework in the oil and gas industry.

When it comes to improving the transparency in the oil market a lot has been achieved through the Joint Oil Data Initiative (JODI) which is coordinated by the IEF Secretariat. The IEF in Doha called for extending JODI to 'other sources of energy'.

'A priori', natural gas seems to be an obvious candidate for extension. As for oil, gas market players would benefit from more transparency on prices and flows. The IEF Secretariat is currently investigating the feasibility and practicality of extending JODI to natural gas in order to improve the transparency in the gas market. However we should not expect any quick and spectacular results from this exercise, natural gas markets are much less transparent than oil markets and there are significant issues of confidentiality of data to be addressed. The IEF-IGU First Ministerial Forum can be an important step in this regard. The panel in session 1 will discuss the relevant questions: would a mechanism of gas data reporting similar to JODI enhance gas market transparency? What are the barriers to achieving this goal? And how can this issue be addressed? The IEF Secretariat would welcome any guidance on the subject.

## IEF-IGU First Ministerial Gas Forum

### Concluding Statement by Secretariats of IEF and IGU

The IEF-IGU 1<sup>st</sup> Ministerial Gas Forum was held in Vienna, 24 November 2008, with the participation of ministerial delegations, international organizations and gas industry leaders from gas producing and consuming countries, from developed and developing countries. “The world gas markets going from regional to global” was the central theme.

Ministers and industry leaders discussed the changing dynamics of the gas markets and the key challenges facing the natural gas industry.

The discussion focused on the following major areas.

#### Investments

- Ministers and industry leaders stressed that, subject to adequate and timely investment, natural gas reserves are sufficient to meet future demand in the coming decades. They discussed the role for natural gas in a “low-carbon emissions” energy-mix scenario and noted that natural gas demand is expected to continue growing in the future, mainly driven by power generation, at an average annual rate of 1.8 % up to 2030. Demand growth is projected to be largest in newly emerging consuming countries (5.8 % in China and 4.8 % in India) as well as in the Middle East (3.8 %).
- While acknowledging that natural gas reserves are amply available, Ministers and industry leaders noted that timely and accurate investments are needed to deliver gas to the markets. The most recent figures estimate the accumulated worldwide investment required in the gas industry to \$ 5.5 trillion up to 2030, or about \$ 230 billion annually - a staggering amount against the background of a global financial crisis, huge uncertainties and extremely volatile oil prices which combine to cause investors to pause for thought.

The current hesitation in gas investment may lead to bottlenecks, in particular in liquefaction capacity, as large gas projects are capital intensive and require long lead times, particularly in a context of a huge cost escalation in recent years and a persisting shortage of skilled labour.

- Considering the uncertainty surrounding the estimates of the investment needed and the related risks, Ministers and industry leaders discussed impediments to investment and underlined the need for a frank and open dialogue between producing and consuming countries to improve understanding and reduce uncertainties that hamper investment.

### **Globalization of the gas markets**

- There was a wide-ranging discussion between Ministers and industry leaders on the globalization of the gas markets and global energy security. They observed that inter-regional gas trade is likely to increase significantly in the coming decades with the Middle East emerging as a major exporting region alongside Russia and Central Asia.
- The bulk of the increase in gas trade is in LNG, which is witnessing rapid changes, becoming increasingly flexible, with greater market access and increased volumes, increased short-term and spot trade. The LNG trade is growing and globalizing, with new consumers and producers continuing to enter the game.
- Ministers noted that, besides traditional LNG projects, underpinned by long-term contracts, recent projects have been endorsed with new business models and more flexible deals based on spot/short-term sales. From a straight-line-chain model, LNG trade is evolving to a multiple-destination or flexible network model.
- As LNG trade is now increasingly linking the regional gas markets, Ministers and industry leaders discussed how this will develop and underlined that, although it is unlikely to see a global gas price in the near future, connectivity and thus convergence of prices between regions will increase.
- While the trend to globalization will continue, Ministers and industry leaders noted that long-term contracts will remain a dominant commercial tool to link supply and demand on capital intensive projects as they enable an acceptable sharing of risk and guarantee security of supply to the buyer and security of demand to the seller.

## Increased interdependence

Among other issues of importance, Ministers and industry leaders noted the growing interdependence between producing and consuming countries. They advocated all parties to find ways and means to translate this higher interdependence into a vector of cooperation and effective action-oriented dialogue through the IEF.

- Ministers and industry leaders encouraged more cross-investment and cooperation between gas consumers and producers, building positively on the interdependence between them. Natural gas exporters are entering ventures in consuming countries such as receiving terminals and distribution networks, while gas importers are involved in upstream gas field development, natural gas transportation and liquefaction plants.
- Going beyond the buyer-seller relationship, enables the two parties to jointly explore and develop new opportunities for partnership and cooperation and to identify potential synergies, Ministers and industry leaders said.
- Ministers and industry leaders affirmed that human resources and technology are key drivers for energy security and encouraged NOCs and IOCs to enhance cooperation and partnership to develop human resources and encourage R & D efforts in pursuit of efficiency and cost improvements through technological advances.
- Discussing the issue of gas transport and the role of transit countries, Ministers and industry leaders noted that the development of transport and transit infrastructures will enhance interdependence between producing, transit and consuming countries and called for regional agreements and a better coordination between governments and companies to reduce uncertainties and thus encourage investment.
- Ministers and industry leaders also emphasized the need to improve energy efficiency and energy conservation across the board in both gas consuming and producing countries to curb global CO<sub>2</sub> emissions and increase export potential of gas producing countries.

## Transparency

- Recognizing that investment decisions can be facilitated by stable and transparent economic, fiscal, legal and regulatory framework, Ministers and industry leaders advocated all parties to focus on practical ways to improve the transparency of oil and gas markets.

While acclaiming the role of JODI in improving transparency in the oil market, Ministers and industry leaders noted that improving transparency on gas market information such as prices and flows will contribute to the reduction of uncertainties, improve predictability and project planning and leads to better allocation of gas resources across the globe.

- Ministers and industry leaders discussed the relevant issue whether a mechanism of gas data reporting similar to JODI would enhance gas market transparency and encouraged the IEF Secretariat to assess with other relevant international organizations possible extension of JODI to cover natural gas data.

## A sustained and enhanced global dialogue

- The shared understanding is that through an enhanced and sustained dialogue natural gas stakeholders can better address key challenges facing the gas industry such as market transparency, investment, interdependence, transit and contractual frameworks.
- Expanding markets, their globalization and the development of capital intensive infrastructures require enhanced cooperation and a global and sustained dialogue between the energy industry and governments.
- Ministers and industry leaders affirmed that this IEF-IGU First Ministerial Gas Forum is an important step forward in promoting and strengthening a global dialogue between natural gas producing and consuming countries, and welcomed the invitation of Qatar to host the second IEF-IGU Ministerial Gas Forum in 2010.