



**UNITED NATIONS
ECONOMIC COMMISSION FOR EUROPE**

COMMITTEE ON SUSTAINABLE ENERGY

Working Party on Gas

STUDY

**The Impact of Liberalization of Natural Gas Markets in the UNECE region
--Efficiency and Security**

17 March 2012

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Executive summary

Liberalization of gas markets is at various stages throughout the 56-country UNECE region. Most countries that have liberalized have done so formally but rarely claim to have reached a satisfactory end state. Liberalization takes time and continuous adjustment of means and goals. But customers, especially wholesale, benefit on prices where liberalization is most advanced. The downside is that gas prices tend to be more volatile and there are fewer possibilities for Governmental control. Liberalization leads to more integration and interconnection, as companies start doing business in neighbouring markets.

The notions of gas market liberalization and security of supply do not combine easily. Indeed, the main obstacle to gas market opening – long-term “take or pay” contracts--have been and continue to be the backbone of reliable gas supply. They will retain this important role for the next decade and probably longer. Nevertheless, liberalization in gas distribution has stimulated gas demand, expansion of local gas distribution infrastructure, and provision of more options for consumers. Finally, upstream market liberalization will grow in importance concerning the provision of the required quantities of gas supplies in an environment marked by increasing demand and increasing competition for natural gas between the regions.

Liberalization has changed the legal and economic framework of the gas industry. In the EU, the gas sector has restructured from national monopolies to an EU oligopoly, and there is still no real competition. Huge investments are needed in networks (high pressure and low pressure) and gas storage capacities to address potential supply disruptions, which supports the case for an oligopoly organization.

Conversely, growth in gas demand is expected to be driven by power generation in the future, and yet current pricing and market structures are not amenable to that outcome. The abundant availability of LNG quantities on the global gas market and the ongoing liberalization in Europe are mutually supporting developments.

Liberalization works, but much needs to be done

Liberalization over the past decades has been based on a strong vision of a market that will bring its citizens more choice, more freedom and more efficiency. In a competitive setting, companies have economic incentives to perform at their best. However, the process is neither simple nor fast. Historic and vested interests and the structure of the supply side represent obstacles that take time and perseverance to overcome. A certain amount of market oversight and regulation is necessary but should be kept to a minimum when markets function properly. Liberalization can lead to a gas market that is affordable, sustainable and secure but it is difficult to balance these objectives.

The market can deliver new investments

The United States wholesale market is recognized as a liberalized market (at the wholesale level) in which prices reflect supply and demand fundamentals. Although oil prices often function as a ceiling for the gas price, gas-on-gas competition often drops prices below the oil price, in general to the benefit of the consumer. Price signals are a driver for investments and demand response. This mechanism works, as illustrated by the huge investment (plans) in LNG receiving terminals, interState pipeline projects and unconventional gas plays of the past years when prices were rising. Another example would be the immediate drop in drilling activities when prices dropped in 2009. The system creates boom/bust price cycles as investments need time to materialize, but it is up to market participants to manage the risk. Opening a market to competition implies that all competitors can access the market, which sometimes means that there is more infrastructure than there would have been in a monopolistic structure. A consumer will not notice this, as margins in the gas price

will be limited by increased competition, and new suppliers earn a return on investment from demand for their services.

Long-term contracts and liberalization

Markets can deliver security of supply, meet demand at affordable prices, and provide flexibility. The gas market assigns responsibility to parties best placed to manage it. Some market players believe that even the more developed liberalized markets may not provide all the investment signals required for a timely response by investors or for properly valuing security-of-supply. Other players believe that market mechanisms include security of supply. Depending on the market structure, future developments will determine the role of long-term contracts in liberalized gas markets.

A level playing field needed for successful liberalization

Full-blown competition across the EU is unlikely without further standardization across gas markets. The European Commission is pressing for uniform rules on third party access, and there will have to be greater physical access between individual countries' gas grids. Attitudes to liberalization, however, might change as gas production falls and imports rise.

Energy market liberalization in the EU has been difficult and is likely to remain so. While some countries, notably the United Kingdom, have created fully competitive markets within their own borders, other countries have concentrated on developing "national champions" to compete in an expected Europe-wide energy marketplace. Regulators must ensure a level playing field for all participants in the market. In Europe, liberalization is not the only policy driver for Governments. Along with the Third Energy Package, a Climate & Energy package has been agreed and a new Security of Gas Supply Directive has been proposed.

Gas: an integral part of sustainability

Gas is important for meeting the energy policy objectives of security, competitiveness and environmental sustainability. A liberalized market provides price signals that show its real value. Subsidies distort transparency and lead to unnecessary losses. Gas is not only the cleanest fossil fuel, but also the most flexible. Natural gas can provide the flexibility that wind and solar energy currently need as back up. Finally, biogas could partly replace fossil fuels. Gas is a bridge to a sustainable society and an integral part of a sustainable future.

Liberalization can help in developing gas markets

The Western Balkans are strategically located between hydrocarbon-rich regions (including the Russian Federation, the Caspian basin and the Middle East) and key energy-consuming regions of Western and Central Europe. Thus, the region is well positioned to play an important role in the transit of hydrocarbon resources and in the diversification of oil and gas supply for the region and for Europe as a whole.

At present, gas markets in the Western Balkans are small or non-existent. Reliable and affordable energy supply is crucial for economic development and social welfare across the Western Balkan region. A well-functioning market depends on securing adequate supply and on promoting the enhanced reliability and market performance of diversified sources of supply. Energy markets need significant domestic and foreign investment to refurbish their infrastructure and to build new energy facilities for production, generation, transmission and distribution. The region is committed to liberalization through the Energy Community. Actual implementation could be improved, but it is clear that an open, transparent market, with good public administration and proper market institutions will help the region become a flourishing gas hub.

Non-liberalized regions have their own challenges

The Commonwealth of Independent States is not aiming at a full liberalization yet. The Russian Federation is experimenting with domestic market reforms. The challenge for countries that rely on Government regulation is to keep the system efficient. Countries with large reserves keep tariffs low to stimulate the domestic economy--a policy that undermines energy efficiency. Importing countries face prices determined by market forces, but they cannot pass fluctuating costs on to consumers. This policy leads to inefficiency and heavy cross subsidies.

Many roads lead to Rome

Liberalization is a non-homogeneous process, not a strict set of rules. It is evolutionary, and a country must prepare for changes that vary depending on the level of economic development, geographical location, regional and global trends, cross-border energy trade, as well as business attitudes, corporate cultures, and goals of the energy business elite.

Introduction

The UNECE Working Party on Gas undertakes studies, with the involvement of gas companies and organizations, which enable a comparative analysis of gas market practices, techniques and technologies prevailing in the different countries and companies of the UNECE. In January 2009, Gazprom promgaz proposed a study on the impact of liberalization of natural gas markets on gas demand and prices. The study was to build on the results of a previous study “Gas Saving to Reduce Natural Gas Demand and Enhance Energy Security” that had been prepared by Gazprom promgaz with experts from the UNECE Working Party on Gas in 2007-2008.

The study is designed to be used as a source of strategic information and a basis for decisions on policy development for the UNECE Member States’ governmental bodies, energy corporations and institutional organizations. Dialogue and cooperation in the energy sector will be improved if all stakeholders have a clear understanding of the rules and mechanisms of energy markets. The UNECE’s Working Party on Gas contributes to that dialogue with ongoing studies and meetings of market participants.

Providing security of energy supply to end-use customers is generally accepted to be one of the major challenges for the energy sector in the twenty-first century. Gas demand is now forecast to exceed all expectations, which creates imperatives not only to improve energy efficiency but also to take concrete measures to improve energy security.

Liberalization of natural gas markets was intended to introduce competitive forces and bring prices into line with costs. The expectation was that liberalization would lead to price reductions. However, according to the relevant Eurostat data on EU countries, prices increased significantly from 2000 to 2008. In particular, from 2004 to 2008 they increased by 50% on average and in the industry sector they increased by 60%.

Liberalization led to concentration of the market into an oligopolistic structure dominated by a few major sellers. The persistence of oil-indexed contracts and the high degree of market concentration have prevented the expected price evolution from emerging.

The objectives of this new study by Gazprom promgaz are the following:

- To identify the direct and indirect consequences of reform on the gas market and its participants, taking into account the original goals of liberalization.
- To assess if liberalization can enhance energy supply security, offer lower prices for end consumers, satisfy growing global gas demand and improve energy efficiency.
- To examine the link between efficient gas pricing and efficient gas use and the potential for increasing gas supplies from the Russian Federation and countries of the Commonwealth of Independent States.
- To consider possible improvements in the structure of natural gas markets in the light of the outcomes of liberalization.

A wide range of experts representing the major energy companies and Government bodies of UNECE member States took part in preparing the study. The experts explored the major outcomes of liberalization, including whether it has been a positive force for the development of regional gas markets or a reaction to ongoing market changes.

The study assesses whether liberalization has helped market participants improve their efficiency and grow market shares in order to determine, in their view, the real value of liberalization. Active participation of many experts from different countries confirmed the importance of liberalization for the international energy community.

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1. GAS MARKETS AND PRICING IN THE UNECE REGION

1.1. Before liberalization

The natural gas market emerged in Western Europe following the end of the Second World War, but became significant only in the late 1960s and early 1970s. At the heart of the market were State-owned national transmission companies that enjoyed monopolies in the import and the distribution of natural gas. Certain privately owned enterprises such as German “Ruhrgas” also held dominant market positions in natural gas transmission. European markets were separate and structured around national operators that were quasi-vertically integrated, regulated monopolies. Vertical integration downstream gave a domestic player a dominant position regarding imports, transportation, distribution/storage and supply of natural gas.

The national transmission companies owned the pipeline systems and had sole access to them. This position gave them considerable market power with respect to customers, including the ability to charge discriminatory prices: each customer category was charged a price close to that of the available substitutes (oil), thus being charged the maximum it would pay. Natural gas production was also in the hands of a limited number of companies, usually with significant State-ownership, such as Norwegian “Statoil” and Dutch “Gasunie”. The latter was half owned by the Government and held legal monopolies in export, import and wholesale trade of natural gas. In most European countries, distribution was developed by regional and local authorities in the form of local distribution monopolies. There were also some countries, such as France, Spain and the United Kingdom, that chose to integrate distribution with gas transport monopolies.

In Eastern Europe and the Union of Soviet Socialist Republics, the gas market was entirely controlled by the Government during the communist era. In these countries natural gas was considered a public good that was supplied locally at subsidized prices well below their market value. Government often retained a dominant role in the natural gas market through the respective State companies for years after the fall of the communist regime.

1.2. Liberalization of gas markets in the UNECE region

Liberalization was initiated in the United States, Canada, the United Kingdom and Australia. In the United States, the natural gas industry went through a metamorphosis following enactment of the Natural Gas Policy Act of 1978. The industry changed from a heavily regulated industry to a virtually free, competitive market. Prior to liberalization starting in the late 1980s, the British gas industry was structured with many natural gas producers feeding their output into British Gas, with the latter imposing its terms and conditions on the upstream producers. The market was liberalized progressively between 1986 and 1996 and was organized on a competitive basis, with production in the North Sea using a system of short-term contracts. Until construction of the interconnector the market operated separately from the continental market.

In 1988, the European Commission (EC) published a white paper entitled ‘The Internal Energy Market’ with the aim of establishing a single market in energy in 1992. The realization of a single market for energy presented far more serious obstacles than for other commodities. Since 1992, the liberalization of gas and electricity markets has been a critical agenda for the EC. The promotion of Trans-European Networks (TENs), e.g. for gas pipelines, as put forward in the white paper ‘Growth, Competitiveness and Employment’, added momentum to the political drive of liberalization of energy markets in the EU. The Price Transparency Directive in 1990 and the Gas and Electricity Transit Directive of 1991 can be regarded as first steps to opening European energy markets to competition. The latter Directive allows the use of the pipelines of other nominated gas companies, provided that gas crosses an internal European border. Details on individual UNECE gas markets can be found in the annex.

2. 2. IMPACT OF LIBERALIZATION ON GAS PRICES

2.1. Introduction

This chapter examines the impact of liberalization on wholesale and retail natural gas prices. It must be noted at the outset that price changes in a market being liberalized cannot be attributed solely to the fact of liberalization but may be due to a myriad of other factors.

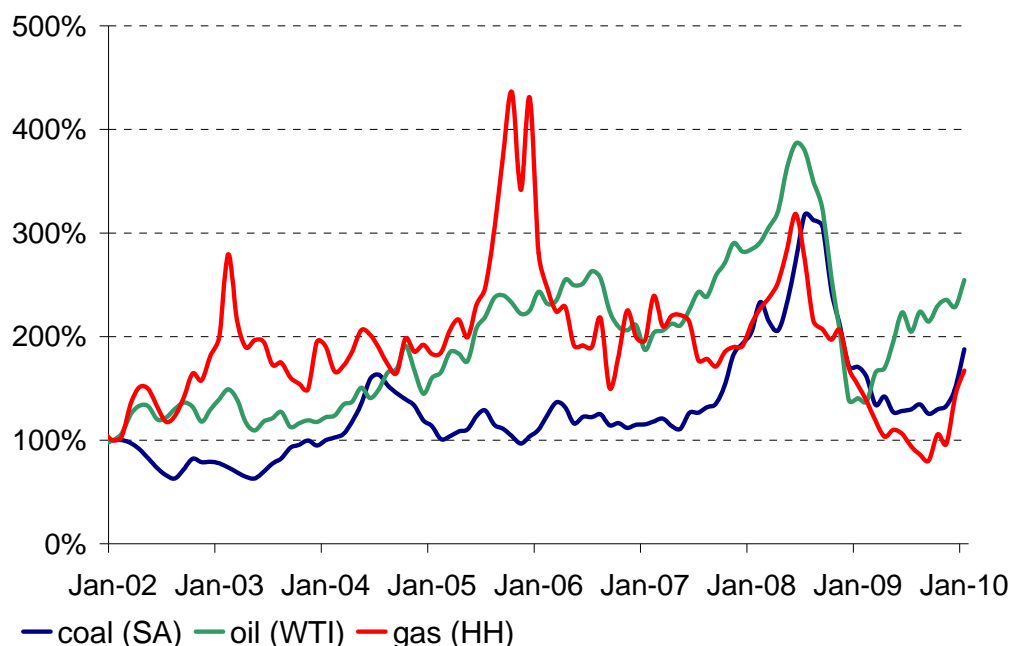


Figure 1. Price developments of coal (Richards Bay FOB 6000kcal 1%S 6A NAR), oil (WTI) and gas (Henry Hub)^{1,2} in the period 2002-2009. Note that bases for calculations are Euro per ton, barrel and MBtu respectively

In 2009, prices for natural gas at the Henry Hub, were roughly equivalent to their 2002 level. In the intervening period they varied by a factor of four were rising up to the start of the financial crisis. The price of coal has been more stable, but has known spikes of up to 300%. Oil prices rose up to four times their 2002 level and remain twice as high as they were in 2009. Other commodities, notably food products have seen similar substantial price changes. It is thought that the price rises were mainly caused by the economic growth in China, India and other developing countries. whereas the price decrease is attributed to a decrease in demand as a result of the financial crisis.

In other words, in the period when market reforms in Europe took place, the main changes in prices reflected supply and demand fundamentals, making it difficult to filter out the effects of liberalization. Liberalization ensures that prices rapidly reflect the underlying costs of production, transport and storage, and enables investors and consumers to respond. In situations of supply surplus, liberalization leads to prices that reflect relatively low marginal costs of supply. In periods of tight supply the converse is true, where marginal costs include not just the commodity value but also the costs of investment.

¹ Platts

² www.oanda.com for exchange rates

Another effect derives from currency fluctuations. The value of the US dollar has changed over time relative to other currencies. As most benchmark prices for commodities are expressed in United States dollars, this fluctuation has had an effect on prices and price perceptions. Figure 2 illustrates this effect. In the period 2002-2004, the dollar and the Euro were roughly equal. The dollar then declined relative to the Euro, making oil "cheaper" in Europe. Since large parts of Europe use oil-indexed price formulas for gas, this currency effect dampened the impact of oil price rises, as oil prices rose five times its 2002 value in dollars, but "only" three times its value in Euros.

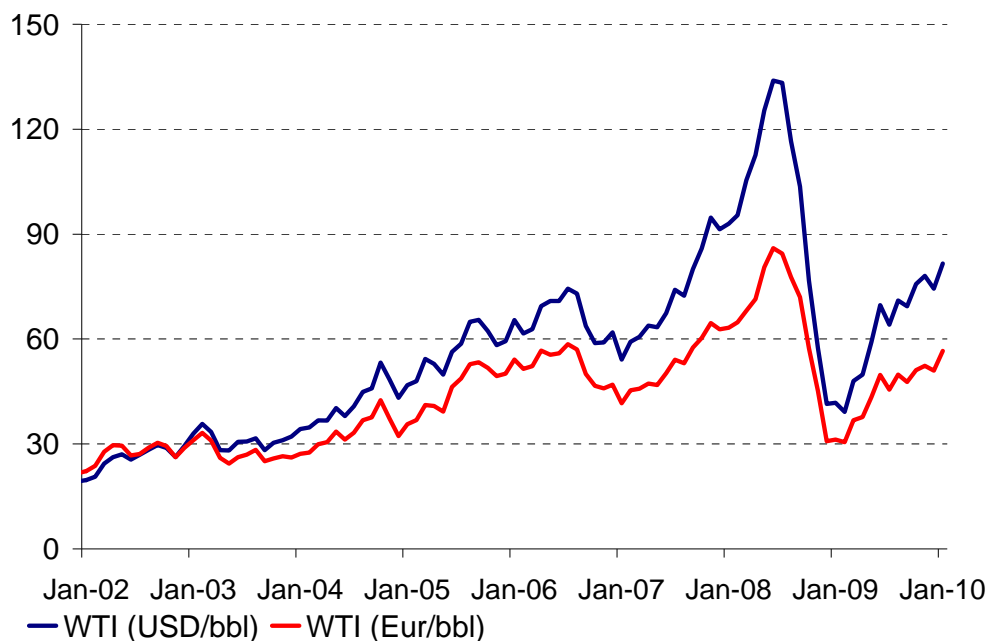


Figure 2. Development of oil price (WTI) expressed in US dollars and Euro per barrel^{1,2}

The purchasing power of individuals affects how they perceive prices. A gas price that is “high” in absolute terms is less remarkable if incomes are also high. Gas prices in Denmark are among the highest in Europe, but when measured against purchasing power, the price in Denmark is around the European average. The policy challenge that emerges is that of income distribution within a country, but it is a challenge for income support rather than for energy tariffs.

After a series of events in the winter of 2005/06 (Hurricanes Rita and Katrina in the US, fire in rough storage in the United Kingdom, nuclear outages in Japan, shortages of hydropower in Spain and severe winter weather in Europe), the International Energy Agency concluded³ that the natural gas industry was globalizing, as price effects were passed on around the globe and demand for gas was soaring. A similar effect can be seen today as a global oversupply drives prices in the spot market down. Once again this influences the analysis of the effects of liberalization, as formerly separated markets started to interact with each other as liberalization kicked in. One could, of course, also argue that it was the liberalization in the first place which opened up markets for global competition and hence globalized the industry.

Figure 3 shows the development of gas prices on the two most liquid gas trading points in the US and Europe: Henry Hub (HH) and National Balancing Point (NBP). Although these two points are separated by more than 9,000 kilometres, prices follow a similar trend; albeit with periods of markedly different prices. It seems that prices so far converged mainly in times of oversupply and undersupply.

³ Natural Gas Market Review 2006: Towards a global gas market, IEA, Paris, 2006

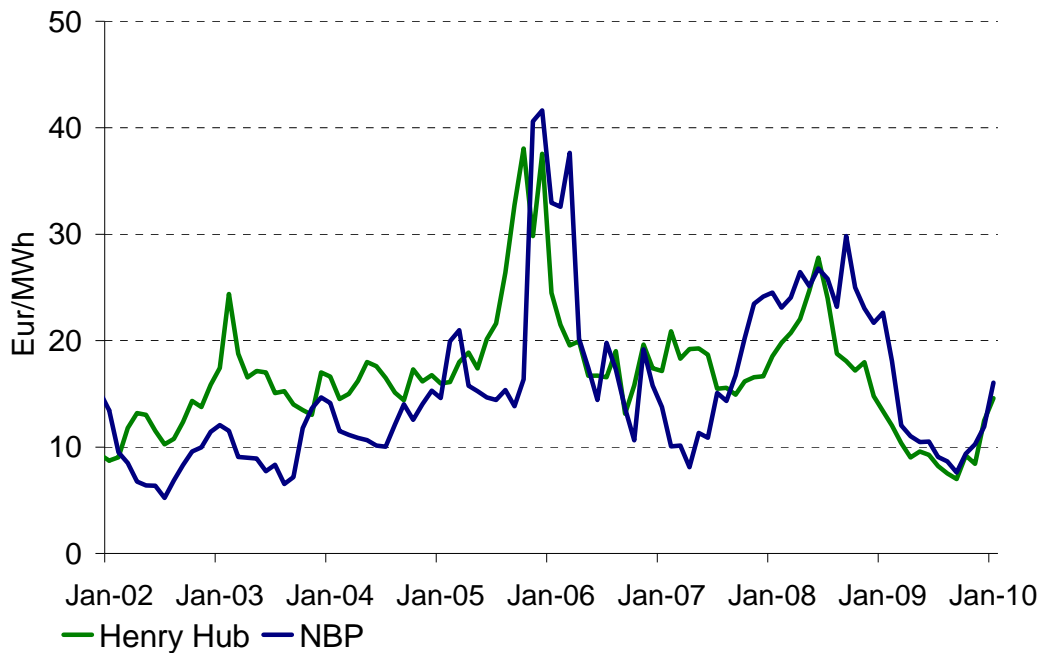


Figure 3. Development of Henry Hub and NBP prices

In Europe, gas has traditionally been sold on an oil-indexed base. With the development of gas trading platforms, first the National Balancing Point (NBP) in the United Kingdom and later others on the continent, an interesting interaction developed between gas traded under long-term contracts with oil links and gas traded on gas hubs in a gas-on-gas competition.

Figure 4 shows the developments of German border prices, traditionally mainly oil linked, averaged and with a 3-9 months time lag. It also shows NBP where gas from the United Kingdom competes with gas imports from mainland Europe, Norway and LNG. As a result of using a time-averaged oil price, the German border prices show a much smoother profile than the volatile NBP. On the other hand, this approach does not allow the price to reflect actual market conditions, making it difficult for consumers to react to price changes. Figure 4 shows clearly that there are times of overlap, but also times of substantial divergence. The use of the flexibility in the long-term contracts is heavily affected by the spot market. Vice versa, the spot market at times imports "oil links".

A last element confusing the discussion on prices is the variation in taxation in various regions. Figure 5 shows that between various countries there is relatively low variation in prices if tax is excluded. Taxes can vary widely from 5% in the United Kingdom to over 100% in Denmark. A consumer in Denmark perceives gas prices to be almost twice as high as in France, but the difference is largely a consequence of taxes.

Apart from promoting the integration of EU energy markets, it is often said that the aim of liberalization is to create lower prices. In fact, the aim of liberalization is rather to create competitive, transparent and effective prices. It is therefore not the absolute price level that is important, but whether a price is "fair" and reflects real market conditions.

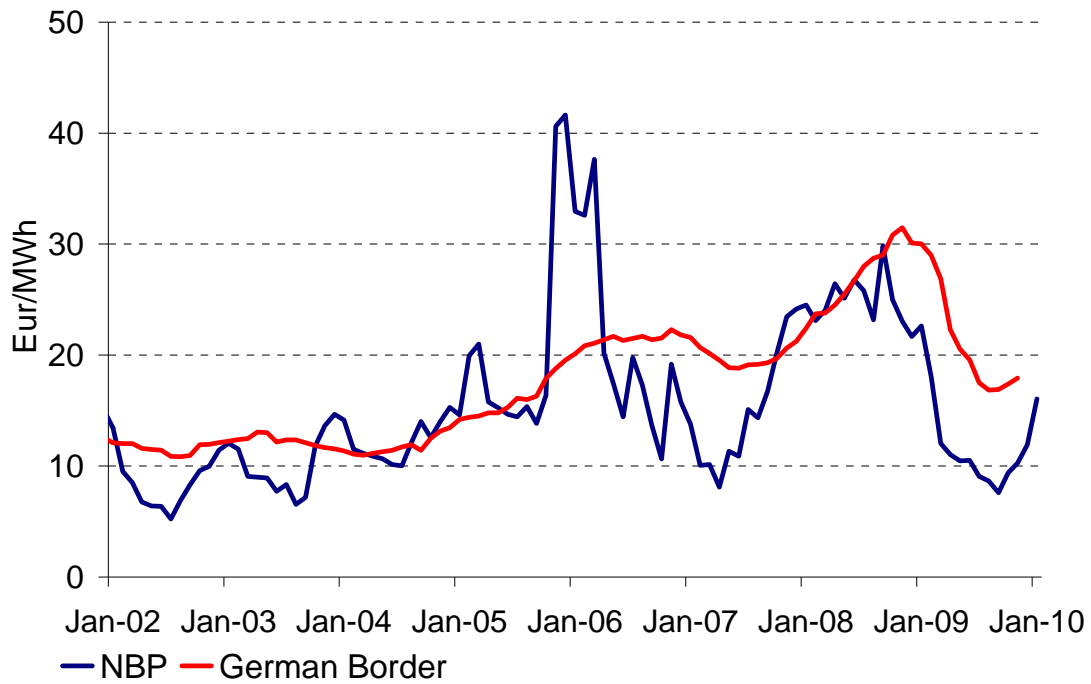


Figure 4. Development of German border and NBP gas prices

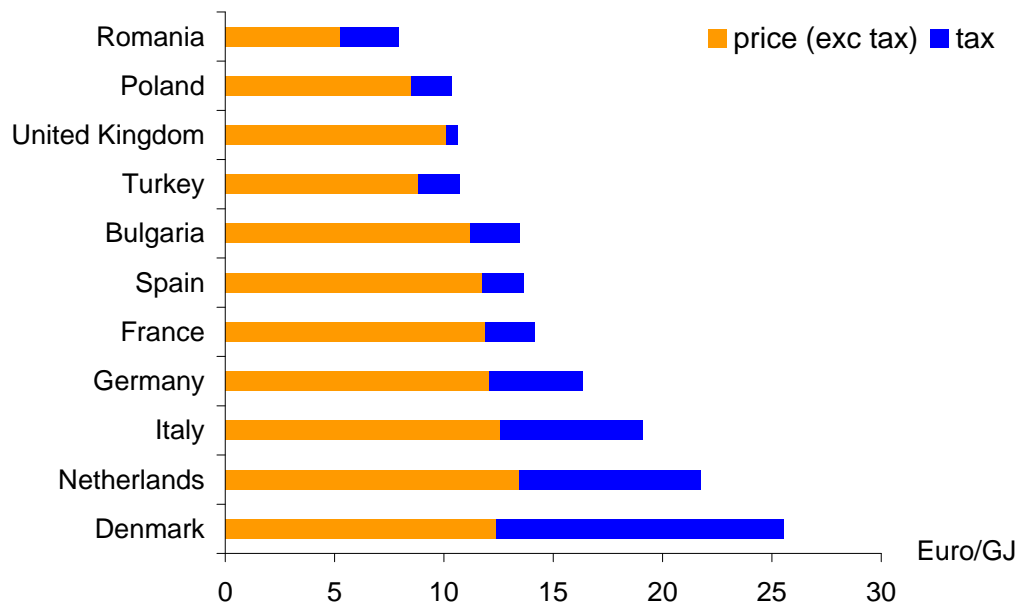


Figure 5. Large domestic (>200GJ) consumer prices in and around Europe⁴

⁴ Eurostat

2.2. Effect of liberalization on wholesale prices

Wholesale gas markets include a range of price formation mechanisms, but they can be grouped into three categories:

1. Regulated wholesale gas prices
2. Wholesale gas prices determined by competition with other fuels
3. Wholesale gas prices determined by competition amongst gas suppliers.

The final price is directly or indirectly determined by a combination of all three mechanisms.

2.2.1. Regulated wholesale prices and liberalization

The fact that prices are regulated implies that they are not liberalized. Yet markets with strict price regulation may show a certain degree of liberalization, as long as various parties can participate in the market under equal conditions and compete with each other for their share in the market.

In the United States, prior to 1978 attempts were made to regulate wellhead prices on a cost-plus basis. This "price control" increased demand, as gas prices were competitive with alternative fuels, but it also reduced incentives for exploration and production and led to shortages. The Natural Gas Policy Act deregulated wellhead prices, allowing more competition and more incentives for producers. The United States is now considered to be the world's most liberalized wholesale market.

Regulated prices are often found in gas-producing countries, where Governments want to use the abundance of natural resources in their country to stimulate other sectors of the economy by providing them with cheap resources. This mostly does not lead to the most effective use of the resource, but can nevertheless be an effective tool, especially when the country is isolated and exports of the gas are not possible.

Figure 6 illustrates the difference in prices between selected producing and consuming countries in the former Soviet Union. Whereas the producing countries can certainly not be called liberalized, certain elements of competition do exist, for example for acreage, licenses and in production.

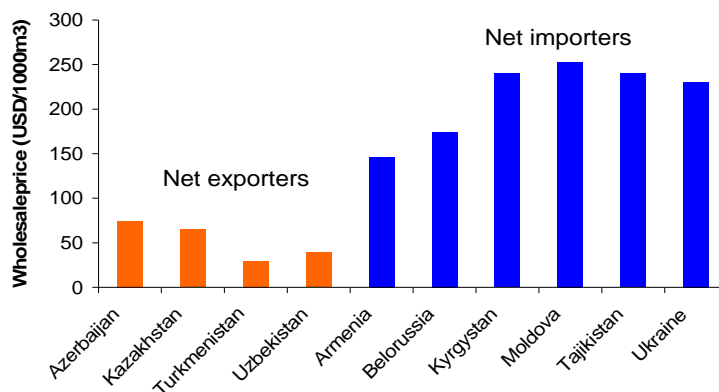


Figure 6. Wholesale prices in selected countries of the former Soviet Union (data are a mix of 2008 and 2009 data and contain estimations. The graph is illustrative)

In the Russian Federation, the price of natural gas produced is determined by an interesting mix of deregulated export prices and (mostly) regulated domestic prices. This situation has proven to be attractive enough for both the incumbent gas producer Gazprom and several independent

producers. Nevertheless the general upward shift in global energy prices since 2004 has increased the gap between export netbacks and domestic gas prices (the implicit subsidy to domestic gas consumers), and also magnified the distortion between regulated gas prices and (unregulated) domestic prices for competing fuels, namely coal and fuel oil.

In September 2007, regulated gas prices amounted to \$55.70 per MCM for industrial users and \$40.70 per MCM for residential users in Central Russia (Moscow region) on a wholesale basis. At that time, the average export price for Russian gas supplied to Europe was \$285.20 per MCM (i.e. the average sales price for Russian gas at the German border), and the average export netback to Gazprom (net of 30% Russian export tax and pipeline transportation costs through Ukraine, Slovakia and the Czech Republic) was around \$157 per MCM. The latter effectively prevents interfuel competition and skews the Russian Federation's energy consumption patterns even more in favour of gas, while the former sharply increased the economic opportunity cost of the low gas price policy at home.

Thus, at the end of 2006 Russian domestic gas policy abruptly changed course. The Government endorsed a plan calling for an accelerated climb in regulated gas prices, with a target of reaching parity with export netbacks by 2011 along with expanding the size of the unregulated segment of the domestic gas market. This does not, however, mean that tariff regulation has been abandoned, but rather that the tariff will be adapted such that producing gas becomes more attractive and that consuming gas becomes less attractive, so that the fuel complex stays in balance while a certain level of price stability and control can still be exerted by the Government.

If Governments decide that gas prices in their country should be regulated, but they would still like to see some competition on the production and wholesale level, they have to make sure that they set a tariff that is attractive enough to invest and create the trust among investors that the policy will not suddenly change.

2.2.2. Wholesale gas prices based on other fuels

Europe and Asia have traditionally relied on pricing mechanisms for gas by indexing to other fuels, mainly oil. Basing the gas price on the fuel it substitutes has provided substantial margins to permit development of the capital-intensive system of production, gathering, transport, storage, and distribution. It has avoided the gas-on-gas competition that might otherwise have limited gas prices and returns on investment. The liquid character of the oil market ensures buyers that a gas price based on this market is not susceptible to manipulation. The last point is of special importance if there are few suppliers.

Pricing on the basis of a competing fuel is in principle compatible with liberalization, as long as both sellers and buyers agree on its principles and take into account the risks associated with either one of them—such as the fact that other suppliers might choose to negotiate prices in another way. The current contract structures based on oil indexation, lag times and smoothing mechanisms have both their advantages and disadvantages in a competitive market. Figure 4 showed that 2009 saw a long period during which oil-based prices were above spot market prices. This divergence enabled new entrants to gain market share. Incumbents relying on oil-based contracts were not able to adapt quickly to changing market circumstances.

Indexation to competing fuels is practised in most (South) Eastern Europe. Because most countries in the region rely on a single supplier, this approach addresses mistrust over price formation. In the countries of the Energy Community, it provides effective price control when exemptions to competition are in place to stimulate the establishment of the gas market.

2.2.3. Wholesale gas prices based on gas-on-gas competition

Liberalization aims to open the market to competition, but a precondition for competition is the availability of alternative suppliers. Competition will emerge when several suppliers can reach the

market. A good example is Spain, which receives pipeline imports from Algeria and Norway and LNG imports from Algeria, Egypt, Libya, the Middle East, Nigeria, Norway and Trinidad & Tobago.

Another good example is the United Kingdom, where declining domestic production has attracted LNG suppliers from around the world and increased pipeline imports from the Netherlands, Belgium and Norway. Even in domestic production, the British market was characterized by many players in the upstream segment. It has been easier for both Spain and the United Kingdom to develop competition than it would be for a country in central Europe with limited access to gas other than Russian gas.

By observing the development of the spot markets (Figure 7), we can see that indeed competition is developing, albeit slowly, starting from the West and spreading to the East. The United States and the United Kingdom have been frontrunners in the development of gas hubs, with Henry Hub and the National Balancing Point (NBP) the most prominent examples. Belgium and the Netherlands followed suit with the Zeebrugge and the TTF hubs, followed by France (PEG), Italy (PSV), Germany (NCG) and Austria (CEGH).

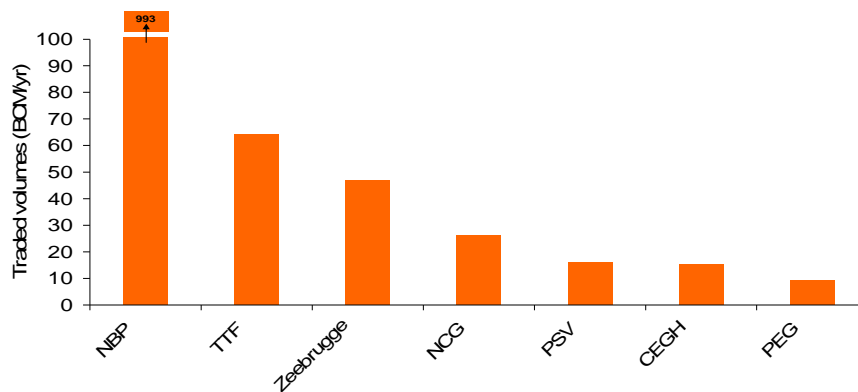


Figure 7. Traded volumes on European gas hubs⁵

It is clear that NBP is by far the largest hub if judged on traded volumes. However, in terms of physical volumes the difference is not that big. In 2008, 69 bcm was delivered at NBP versus 20 at TTF and 9 at Zeebrugge.

Figure 8 shows the development of the TTF hub from 2004. Both volumes and participants are increasing. A similar picture could be given for most of the other hubs. As the overall demand in

⁵ WGI, Feb. 2009

Europe is not significantly increasing, it can only mean that trading on hubs is gaining importance. At the same time it is clear that, apart from the UK, most gas volumes are delivered outside the hubs.

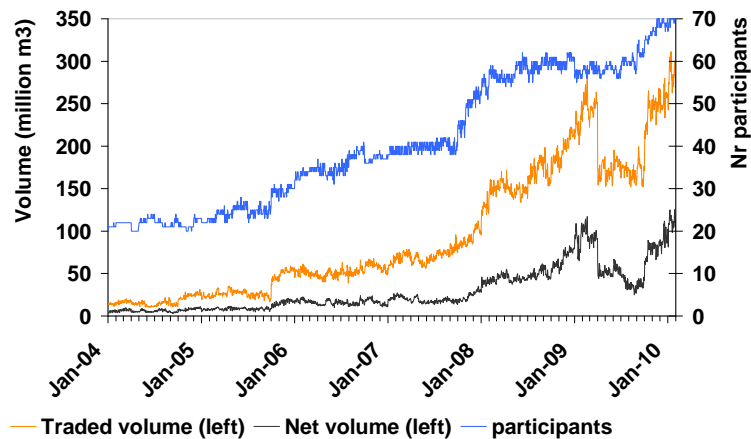


Figure 8. Development of the TTF hub⁶

The market share of incumbent gas companies on the wholesale markets in their respective home country is decreasing, but slowly. In several countries new entrants experience difficulties entering the market because of physical constraints. For historical reasons, the infrastructure is optimized with one or a few large companies or suppliers in mind. In order to promote competition it is necessary to have ample infrastructure available to move gas to the place where it is most needed. Indeed in several Western European countries large investments are planned or under construction by the transmission system operators (TSOs) to accommodate market changes. Infrastructure projects, however, take time to materialize, and in several countries the regulated returns for the investors are simply no incentive given the risks involved.

Figure 4 showed that gas prices determined by gas-on-gas competition can both be lower and higher than prices determined otherwise. Gas-on-gas pricing provides an advantage in that the market signals are immediately clear. In times of oversupply the prices go down and in times of undersupply the prices go up. Market participants can immediately react to the conditions and adapt their sales, production, or purchasing strategy accordingly.

Figure 9 shows that, with the exception of the PSV hub, prices on the various hubs in Europe are similar and follow the same trend.

“Free gas market” elements have emerged in the Russian Federation as well. Gas exchange trading in that country started in late November 2006, with the following three goals:

- to experiment with developing spot trading in non-regulated commercial sales of natural gas.
- to test the limits of prices determined by the interplay of supply and demand and providing indicative market prices.
- to provide Russian gas independents with an important access channel to final users (contracts for sale at the exchange were accompanied by automatic reservation of pipeline capacity).

⁶ www.gastransportservices.nl

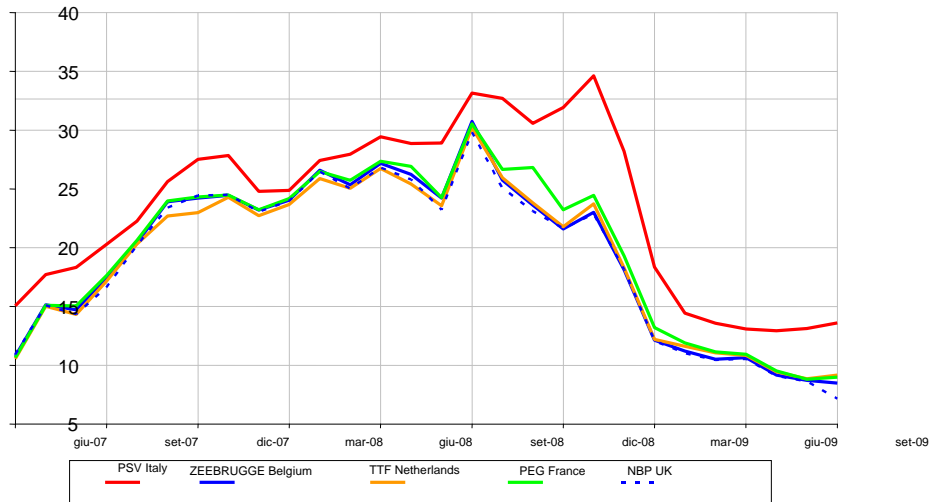


Figure 9. Price developments at main continental European hubs

In 2007 up to 10 BCM were scheduled for sale at the gas exchange—5 BCM by Gazprom and 5 BCM by independent gas producers—but only 6.75 BCM were actually sold. For 2008 the target was raised to 15 BCM (preserving the general parity between the sales by Gazprom and by independents, with the former allowed to sell 15% more nevertheless), but only 6.1 BCM were sold. In 2007 and 2008, the gas exchange operated in a test mode, under the auspices of special governmental resolutions that were valid for one year. In 2009, there were no sales, owing to the absence of a governmental resolution for that year. The future of the gas exchange is up in the air. The future of spot gas trading system remains a key test of the “free gas market” elements in the Russian Federation. The crisis will pass, sooner or later, and it is worth keeping the institutions that enhance competition and efficiency.

Gas prices in the Russian Federation were to be liberalized in 2011 (initially for industrial users, but after a transitional period for residential users as well). This “free gas market” would require a price benchmark, and the indicative prices at the gas exchange could serve this important function. An important signpost to watch for will be a government resolution on the Russian gas sector.

2.3. Effect of liberalization on retail gas prices and consumers

2.3.1. Progress of liberalization on the retail markets

The question of whether liberalization has had its effect on retail market prices should be preceded by the question of whether price regulation has actually ceased to exist. In the United States, there are 21 States and the District of Columbia that allow residential consumers and small customers purchase natural gas from other than their traditional utility company. As a result, 54% of all residential customers have choice of supplier.


Within the participating States, 82% of customers are eligible for choice. However, only 13.5% of these exercise the option. Customer participation levels vary from almost 0 to 100% between States and the amount of active marketers ranges from 4 to 14, with just New York having 50 active marketers. Only limited data are available on price effects for the consumer making it impossible to draw conclusions on the efficiency of retail competition in the United States⁷.

⁷ State of the markets report 2008, FERC, 2009

Table 1. Overview of market opening and price regulation in open gas market segments as of 1 July 2008⁹

Country	Market opening Final market opening date	Price regulation on 1 July 2008			
		Households	Small businesses	Medium to large businesses	Energy intensive industry
Austria	2002-10	NO	NO	NO	NO
Belgium	2003-07	NO	NO	NO	NO
Czech Republic	2007-01	NO	NO	NO	NO
Denmark	2004	YES	YES	YES	NO
Estonia	2007-07	NO	NO	NO	NO
France	2007-07	YES	YES	YES	NO
Germany	1998	NO	NO	NO	NO
Greece	2009-30	Closed Market	Closed Market	Closed Market	Closed Market
Hungary	2007-07	YES	YES	YES	NO
Ireland	2007-07	YES	YES	YES	NO
Italy	2003-01	YES	NO	NO	NO
Latvia	2010-01	Closed Market	Closed Market	Closed Market	Closed Market
Lithuania	2007-07	YES	YES	YES	NO
Luxembourg	2007-07	NO	NO	NO	NO
Netherlands	2004-07	YES	YES	YES	NO
Poland	2007-07	YES	YES	YES	NO
Portugal	2010-01	Closed Market	Closed Market	Closed Market	Closed Market
Romania	2008-07	YES	YES	YES	NO
Slovak Republic	2007-07	YES	NO	NO	NO
Slovenia	2007-07	NO	NO	NO	NO
Spain	2003-01	YES	YES	YES	NO
Sweden	2007-07	NO	NO	NO	NO
United Kingdom	1998	NO	NO	NO	NO

Except Bulgaria, Finland, Croatia, Iceland, Turkey (NA); Except Cyprus, Malta, Norway (no gas)

Price regulation:

 YES
 NO
 Closed Market

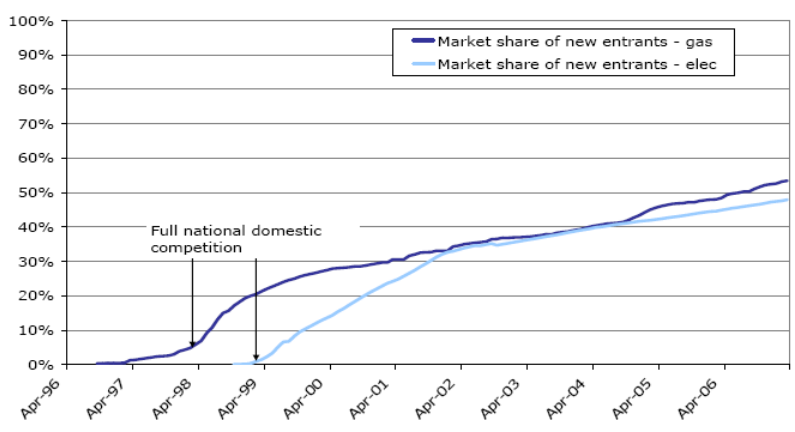


Figure 11 New entrants in United Kingdom gas and electricity market¹⁰

¹⁰ Domestic retail market report: June 2007, Ofgem, 2007

2.3.2. Competition in retail prices

Research suggests that consumers can benefit from increased competition as long as they are active themselves in looking for the best offer.

Wallonia was liberalized four years later than Flanders, and the interim period allows comparison of price developments in Belgium under liberalized and non-liberalized conditions. Prices for gas in Wallonia (non-liberalized) were structurally 5-10 % higher than the average contract price in the liberalized markets, and up to 13% higher than the average lowest price.

In the Netherlands, a recent report concluded that in 2008 a switcher could save €75 to €150 per year on the combined electricity and gas bill. The researchers observe that in a comparison of advertised prices on the internet, the highest offers are sometimes twice the price of the lowest offers. The companies with the lowest prices sometimes offer below cost price to attract customers¹¹.

In Italy, a domestic client on the regulated market pays on average c€4.25/m³ more than on the free market, a commercial client c€3.65/m³ more, an industrial client c€7.39/m³ more, and, finally, a power generation client (few clients of small-mid size) pays c€6.87/m³ more on the regulated market than on the free market.

In France, each customer has the choice between two different types of contract: (a) contracts under regulated tariffs, offered by incumbent suppliers only, whose price level is decided by the Minister after consultation of the Regulatory Committee, on cost basis (LT as well as spot (partly) supply contracts, transportation and distribution tariffs, etc) and (b) contracts at market prices (offered by incumbent suppliers and alternative suppliers).

At the end Q2 2009, 13% of the connections had a contract at market price and 6% had an alternative supplier. The latter is more successful in new developments, because the incumbent supplier prefers not to fight hard on that kind of client. The alternative supplier, possibly backed by an energy group, can offer favourable price conditions in order to get market share. The pricing policy of the authorities consists of maintaining the regulated tariffs unchanged as long as possible, which opens opportunities in case the spot market price drops. This explains the fast evolution of the market share of customers choosing free prices during the first half of 2009.

In Spain, about 90 % of the total gas market has changed supplier since the beginning of liberalization, and nearly 40% of clients have changed supplier since the opening of the domestic market in 2003 (2.7 million clients). The maximum delay to switch is 15 days. In order to make the switching process easier, the set up of an “Office for switching supplier” has been established under Law 12/2007.

The structure of Spain's retail gas market has changed in recent years. New entrants have nearly 40% of market share and competition is strong. At present, there are 17 active marketers in the gas market. However, the top four companies in this market, which are Repsol YPF-Gas Natural + Unión Fenosa, Iberdrola, Endesa and Naturgas, hold almost 90% of the retail market share.

Therefore, competition on price takes place in the retail sector. The consumer, however, is reluctant to switch. The Ofgem report mentions that almost 40% of domestic customers claim not to switch for price reasons and over 60% are not willing to switch if the saving is less than €200 per year. The customers are generally happy with their supplier, are afraid of the administrative burden and unwilling to spend time and energy in the search process. Consumers generally switch when they move, after reading about the energy market, after receiving a bill, or as a result of direct marketing activities by the retail companies.

¹¹ Assessment of the Effects of Tariff Regulation on the Dutch Residential Retail Markets for Energy, Boaz Moselle, The Brattle Group, 2009

The British regulator observed that markets competed actively for active customers; however, they also observed that certain groups of customers (with pre-payment meters, elderly customers, customers with low incomes) do not enjoy the full benefits of competition as they are less likely to look for and find the best deals. Ofgem is to take temporary measures to protect vulnerable customers and will introduce new guidelines aimed at higher transparency and engaging customers in the competition process¹². Most of the report data obtained originates from the pre- or early-financial crisis time. It will be very interesting to see how the financial crisis, which coincided with huge differences between spot market prices and long-term contract prices, has altered the willingness of individual customers to look for the best offers.

2.4. Conclusions

2.4.1. Wholesale market

With the exception of North America, wholesale markets in the UNECE region remain dominated by incumbents. The lack of free firm transport capacity is often cited as one of the main reasons for the slow development of competition. As infrastructure projects have long lead times and incentives for companies to build new infrastructure are either unclear or unattractive, competition is increasing only slowly. Regulatory pressure on transport tariffs has obviously resulted in lower transport costs as part of the total bill, but care should be taken that this does not lead to a negative investment climate. The latter might prevent competition, thus leading to higher prices.

Even though the desired end state of liberalization has not been reached in many cases, the trend is towards more competition. Incumbents do try to enter new markets themselves, in most cases their neighbouring markets. They have a preference for large growing and changing markets. The best example is probably the United Kingdom, which is a large market, with a well-established demand and a near certainty that domestic production is less and less able to supply the market. Several neighbouring countries have built large pipelines to the United Kingdom and a number of large LNG receiving terminals are built as well. Large customers are often the first targets for new entrants who compete on price, as price can be the determining factor for choosing a supplier for large customers. Gas trading platforms (hubs) are developing everywhere and often show growing trends¹³. Gas-on-gas competition leads to both up- and downward pressure on gas prices when compared to oil prices, but due to the depressed gas demand during most of 2009 the downward pressures have been the most obvious. As a result of the increasing importance of gas-on-gas competition and fast-changing market conditions, new contract types and pricing models keep appearing.

2.4.2. Retail market

Only a few retail markets are completely deregulated, most have some form of end user protection, either temporarily or continuous. Consumer protection can take the form of a maximum price or allowing consumers a choice between a regulated tariff and a free tariff or providing support for vulnerable customers. Competition is increasing in most European markets, although slowly, with the incumbent remaining dominant but losing share. As in the wholesale market, the most successful new entrants are incumbents from neighbouring markets.

Some countries report large price differences in offers by suppliers to the benefit of the consumer who chooses the right supplier. Nevertheless switching rates are seldom very high although they do vary from country to country. Consumers are not always well aware of the

¹² Energy supply probe: proposed retail markets remedies, Ofgem, 2009

¹³ The authors consider the decrease in gas trading as observed on the European hubs in mid 2009 a temporary slowdown of this trend related more to the financial crisis rather than the decreasing attractiveness of hub trading.

possibility to switch and of which benefits can be gained—which is a concern to policymakers. On the other hand, until recently, choosing a new energy supplier is low on the priority list of consumers, even if it can save substantial amounts of money. It is unknown how this attitude has changed as a consequence of the financial crisis. There is a risk that suppliers anticipate this consumer behaviour in their price offers by giving more competitive offers to "active" customers. Since liberalization started, companies have successfully experimented with a range of new products in order to gain or maintain market share. Examples of this are the emergence of "green" energy, signing bonuses, energy-saving advice, and fixed and flexible tariffs.

2.4.3. Commonwealth of Independent States

The Russian Federation, as the largest country in the Commonwealth of Independent States, might have the intention to further liberalize its domestic energy sector. In the gas sector, this should mainly lead to more activity of third parties in the areas of exploration and production and domestic sales. The aim would be to attract investment, and increase energy efficiency and production. Establishing a gas exchange and increasing the activity of independent producers are promising signs. Both could be expected if the electricity sector repeats itself in gas.

Whereas many countries expect liberalization to reduce energy prices, the Russian Federation uses it to raise prices to a level consistent with export prices. Low prices have been a Soviet legacy in many CIS countries but rising import prices are now changing the picture. But since high prices may have a severe impact on the lives of ordinary people and could potentially lead to social unrest, it is understandable that some CIS Governments choose to keep consumer prices low by either direct or indirect subsidies. This often leads to unsustainable situations as national budgets are stretched to their limits and distorted price signals are given to the market. Higher prices will in the end provide incentives for a more efficient use of the blue fuel in the CIS.

3. LIBERALIZATION AND SECURITY OF NATURAL GAS SUPPLY

3.1. Gas markets and security of supplies before liberalization^{14 15}

The natural gas market emerged in (Western) Europe in the years after the end of the Second World War, but became of significance only in the late 1960s and early 1970s. It was in these early years of the natural gas market development that the energy sector became increasingly politicized. The oil crises of 1973 and 1979 brought energy security to the top of the agenda in the Western Europe. Government involvement was deemed crucial for ensuring natural gas supply security since many of the supplier countries were considered politically unstable. In addition to that, political considerations shaped Government strategies for achieving security of supplies. For instance, in Western Europe there was widespread belief that imports from the former Soviet Union must be limited to certain shares of the market.

Yet while the Governments in the West defined the broad strategies for energy security the actual responsibility for reliability of supplies was vested in one single actor—either a monopoly (de facto or real) State-owned gas company, or a private company based on exclusive concession rights. Indeed, the European markets used to be separated and structured around national operators that often enjoyed a monopoly, as the common model of quasi-vertically integrated, regulated monopoly. Vertical downstream integration gave one player on the domestic market, a dominant position in imports, transportation, distribution/storage and supply of natural gas. In exchange, this entity would take responsibility for security of supply for the whole gas market.

These companies successfully addressed the issues of short- and long-term adequacy of supply, and adequacy of infrastructure for both normal and peak consumption rates. They handled these tasks by applying discriminatory prices for the different customer categories. By extracting maximum revenues from the consumers, the companies managed to recuperate their investment costs in the shortest possible period. This played an important role in the growth of the gas-supply grid infrastructure in Western Europe.

Taking into account the governmental policies, these national incumbents ensured security of natural gas supplies by signing long-term contracts of 20-25 years with producer countries. There were several important reasons for signing such contracts:

- They provided a stable economic basis that guaranteed the pay back of the investment in upstream and downstream infrastructure. The latter was of particular importance in the early growth phase of the European gas infrastructure in which markets were still limited, in need of development and provided no alternative outlets for the gas.
- The duration of the contract was seen as important factor in the negotiations with external producers. In relation to the very few gas producers, purchasers were in a stronger bargaining position to negotiate the terms for their future supplies if they had a diversified portfolio of long-term contracts. Otherwise, the buyers risked to be put in a situation, where under pressure they had to accept gas supplies under less favourable terms.
- The exporters considered long-term contracts as a guarantee that the purchase obligations under long-term contracts would be fulfilled. Otherwise, the exporters at the time would have been far less willing to launch large-scale production investments.

The structure of the Western European natural gas market that emerged met the task of establishing reliable and secure systems of supply. Big national monopolies developed the necessary gas infrastructure, while long-term contracts underpinned supply reliability, especially in countries

¹⁴ Marian Radetzki, European Natural Gas: Market Forces Will Bring About Competition in Any Case, IAEE Newsletter, Third Quarter 1998

¹⁵ International Energy Agency, Regulatory reform: European Gas, Market Energy Reform 2000

relying on gas imports. Consequently, natural gas began to play an important role in the European energy mix to the benefit of the European countries. On the downside, the new gas industry was not cost-efficient or customer oriented. Gas tariffs paid for the development of the gas sector and, while high price levels may have been justified in the early stages, in the long-run they restrained expansion of the market.

The demand for natural gas within the EU saw a significant downturn in 2009 as a result of the global economic and financial crisis. Even so, the predications are that in the long run, as the European economies recover, the EU will need more gas not less. With the ever-decreasing domestic production of natural gas, this means that the EU will be increasingly reliant on natural gas imports.

Ensuring the security of gas supplies in such situation will be a challenging endeavour and one that will require enhanced coordination among the various actors within the EU natural gas sector. The proposed new regulation on security of gas supplies is an important measure that aims at streamlining the gas-supply security efforts and the emergency reactions at European level.

The continuing process of the gas market liberalization is another area that will contribute to EU energy security. The increased competition and the increased market integration will inevitably stimulate the spot gas trading, which plays an important role in satisfying gas demand, especially during peak periods.

Finally, the projects for the development of crucial gas infrastructure will be central to the long-term EU security of supply strategy. Nevertheless, the construction of complex and expensive pipelines provided solid guarantees for the recuperation of the economic costs. The guarantee can only be provided by the long-term supply contracts and this has been recognized at the European level. As paragraph 42 of Directive 2009/73/EC States:

“Long-term contracts will continue to be an important part of the gas supply of Member States and should be maintained as an option for gas supply undertakings... It is therefore necessary to take them into account in the planning of supply and transportation capacity of gas undertakings.”¹⁶

In the United States, the enactment of the Natural Gas Policy Act of 1978 changed the natural gas market completely from a fully regulated industry to a liberalized, competitive market. Canada soon followed with the enactment of the 1985 Western Accord on Energy Pricing, which led to the liberalization of the country's gas market. The Government launched radical transformations seeking to develop competition in the USA and Canada. The main principles and conditions of gas market liberalization in these countries include:

1. Waiver of Government regulation of producer's sale prices and wholesale market prices. Nevertheless, the Government continues to control domestic consumer retail prices and transport services prices.
2. Privatization of Government holding companies and unbundling of natural monopoly and potential competitive gas company's activity categories (i.e. unbundling of supplier and transporter functions) by maintaining tough regulation of natural monopoly, including tariff regulation.
3. Granting large consumers the right to choose their supplier.
4. Varied incentives encouraging new participants to enter potentially competitive market segments.
5. Introducing non-discriminatory third-party access to gas transporting systems for consumers, producers, traders and suppliers. This allows access to the system thus enabling gas market participants to buy gas directly from producers. Third-party access to the gas-main pipeline networks implies that the owner of the transport asset has just the role of a transportation company. This company provides a range of relevant transport services, not connected with gas sales. Onshore and offshore pipelines, supply networks, LNG terminals, gas storages etc.

¹⁶ Directive 2009/73/EC of the European Parliament and the Council of 13 July 2009 regarding the common rules for internal market of natural gas and repealing Directive 2003/55/EC.

are also considered transport assets which need to be accessed. So, entities which are responsible for providing access can be gas transporting companies, distributing companies and rarely gas producers. The main problem in connection with third-party access is that the owner of these capacities has no motivation to provide nondiscriminatory access if he can perform gas supplier functions.

6. Creating conditions, promoting trade of secondary transport and storage (underground gas storage) facilities (resale of reserved facilities).
7. Securing high market transparency through establishing public accessible information sources, providing data about volume of supplies, demand, free capacities, prices etc.

The country-by-country descriptions in the annex include an examination of the natural gas sector in the UNECE region. The Russian Federation is an important player impacting the energy security of the European countries. Indeed, the reliability of gas supplies for Europe is and will be increasingly influenced by the developments within the Russian internal gas sector. Turkey's^{17 18} geographic location has prescribed it an important role in the context of European energy security. Indeed, in recent years the country has opted to participate in a number of energy projects with the aim of becoming a strategic energy hub. Finally, Turkmenistan is a country with natural gas resources that attract the interest of the EU, but also of other non-European energy-hungry States.

The natural gas markets in the Balkan countries are both important and increasingly developing. The descriptions in the annex focus on the status of gas sector liberalization in these countries and on the efforts and strategies of each of them to achieve energy security. The overall goal is to assess whether liberalization (or the lack of it) impacts the security of gas supplies of the different States and whether it affects the development of the forthcoming natural gas infrastructure projects (pipelines, interconnections, LNG terminals and storages) passing through the Balkan region.

1. ***EU membership status***

- *Members*: Bulgaria and Romania (These two countries were chosen because they have joined the Union only recently. Hence, it will be useful to compare the state of their gas markets in the first years of European membership to that of the non-EU States in the region. We do not examine Greece and Slovenia, which are part of the EU25 and as such belong to the next chapter);
- *Candidate countries*: The former Yugoslav Republic of Macedonia, Croatia;
- *Non candidate countries*: Serbia, Bosnia and Herzegovina;

2. ***Natural gas production***

- *Significant (50%+ of the local consumption)*: Romania, Croatia;
- *Insignificant*: Bulgaria, Serbia;
- *None*: Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia;

3. ***Natural gas consumption***

- *Significant (more than 5 bcm)*: Romania;
- *Average (1 to 5 bcm)*: Bulgaria, Serbia, Croatia;
- *Insignificant (less than 1 bcm)*: Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia;

4. ***Level of development of natural gas market***

- *Emerging (no or very few consumers, underdeveloped grid, no possibility for competition)*: Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia;
- *Developing (few consumers, advanced process of grid development, some readiness for free competition)*: Serbia, Croatia;

¹⁷ Turkish natural gas market and legal regulations, paper presented at World Gas Conference 2009 by IGDAS Istanbul

¹⁸ Liberalisation of Turkish natural gas market and progress made in distribution sector of Turkey, paper by Sibel Sayiner presented at World Gas Conference 2009

- *Developed (enough consumers, developed grid, traders ready to function in a competitive market):* none
- *Advanced, but not fully developed (some but not all of the criteria of the last group are fulfilled):* Bulgaria, Romania.

The other members of the Balkan region namely Albania, Montenegro and UNMIK (United Nations Mission in Kosovo) have no national gas market.

3.2. Security of supply in liberalized gas markets

The purpose of this chapter was to establish whether and in which way the liberalization of the natural gas markets (or the lack of it) impacted the security of gas supplies in the countries of the UNECE region. The starting point of our research was to examine the structure of the gas market that functioned before the beginning of liberalization in the EU in order to see how this system coped with securing the necessary supplies.

It was determined that the traditional European gas market has been structured around very few, mostly State-owned, gas importing/trading companies who enjoyed exclusive concession rights on their respective national gas markets. These companies imported the natural gas from among a limited number of producers/exporters on the basis of long-term contracts, thus allowing for the risk-sharing between the two parties. Such an arrangement allowed for the development of a secure system of gas supplies, which has successfully operated for decades without any major supply interruption, but with costs passed on the customers. It was precisely the economic inefficiency of the old structure that was at the centre of the calls for liberalizing the natural gas markets.

*3.2.1. Liberalization and security of supplies – theoretical perspective*¹⁹

From a theoretical point of view, a liberalized market will aim at maximizing efficiency, minimizing costs and producing the lowest possible prices for customers. In the area of natural gas supplies a competitive market will ensure that monopoly power cannot be exercised by just one dominant company. “Where natural monopoly is involved – particular in terms of network ownership – this must be regulated in such a way as to promote ‘reasonable’ charges for transportation and rules for use of the network.” This regulatory framework will allow “market players and market (particularly price) signals to dictate commercial decisions, efficiency will be maximized and costs minimized, translating into lower prices for consumers.”

In a truly liberalized natural gas market, the producers will have the freedom to provide natural gas on their preferred commercial time schedule, which in times of higher prices will lead to a surplus of supplies followed by price downfalls. The downstream sector will be covered by a large number of companies such as transporters, shippers, suppliers, distributors and network operators. All the market players will function under legislation and regulation, which will define among other things their security obligations. The power to modify these obligations will be vested in the hands of the national regulators that will operate under the instructions of the Governments.

The participation of a large number of players on the liberalized gas market will increase gas to gas competition, which in turn will stimulate the diversification of gas supplies. Furthermore, the increased competition will lead to an increased liquidity of natural gas. And this, in turn, will stimulate the development of the global exchange trading and financial system, which could send price signals allowing for the most efficient allocations of gas supplies and transportation capacity in times of emergency.

¹⁹ Jonathan Stern, Security of European natural gas supplies, Royal Institute of International Affairs, 2002 p.24-25

Where the competition market has disadvantages is that it induces companies to focus on projects with short-term profitability, while avoiding participation in long-term contractual arrangements, as well as the development of assets for emergency use. As a result, the companies “will not willingly hold unnecessary inventories of gas, reserve transportation or storage capacity surplus to immediate requirements, unless they are allowed to pass through the extra costs to other market players or customers. Thus, a liberalized and competitive market requires complex contractualization of security arrangements between market players and regulators and between market players themselves.”

3.2.2. *Liberalization and security of supplies – empirical results*

Few countries in the UNECE region have liberalized their natural gas market fully. Some have adopted market liberalization legally without implementing it in practice; others have liberalized their gas markets in part; and a third category has not begun liberalization.

There are several reasons for the lack of full liberalization:

1. *The persistence of long-term supply contracts:* This feature has been identified by the European Commission as the biggest obstacle to opening wholesale gas markets. Most importing countries in the ECE region have signed long-term gas supply contracts that pre-date the onset of liberalization. “Take or pay” clauses in these contracts oblige importers to purchase the contracted natural gas supply, thereby limiting market access for newcomers.
2. *The lack of ownership unbundling:* While legal unbundling of gas trading/distributing and transportation operations has occurred in most States, few countries have unbundled ownership, a step that would lead to true third party access to transmission networks.
3. *The lack of price liberalization:* In certain countries (e.g., Bulgaria, Romania, Croatia), natural gas prices even for eligible consumers have remained well below market value despite liberalization, which discourages new entry.
4. *The strong Government involvement and the complicated internal regulations:* These last factors impeding liberalization are mutually reinforcing and are common in non-EU UNECE countries, (though also in some *de jure* liberalized EU Member States). These factors limit new entry.

How has the current state of natural gas market liberalization affected the security of supplies?

1. *Diversification of suppliers has been impeded:* The gas market structure in most UNECE Member States is unchanged from the period before liberalization, with incumbents dominating the sector. Limited access for new entrants limits the opportunity to diversify gas supplies.
2. *The underdevelopment of crucial gas infrastructure:* Limited liberalization in countries with still emerging gas sectors has slowed development of critical gas infrastructure. Private companies are blocked from participation in construction of the local gas transportation and distribution networks, but also small-scale gas storage facilities. A particular success story can be found in Turkey. The country opened its gas distribution sector then witnessed very fast development of its internal transportation and distribution grids.
3. *Development of long-term security of supply projects:* While long-term contracts have impeded the natural gas market liberalization, they have favoured development of long-term, capital-intensive supply projects such as the North Stream, South Stream and Nabucco pipelines, LNG terminals (Turkey, Croatia) and intersystem connectors. Realization of these projects would not be possible without the insurance provided by long-term “take or pay” contracts. The contracts make the projects economically viable, with producers assured of income and suppliers able to obtain needed quantities of natural gas in the long-run.

Although long-term contracts provide economical justification for these costly projects, one needs to consider the role of Governments and the political rationale behind the projects. The truth is that there is very strong political motivation behind the implementation of projects such as South Stream and Nabucco, which demonstrates that the Governments still regard the natural gas sector as a domain of national strategic interest.

Finally, gas-importing countries in the UNECE region will face increasing competition from other regions (e.g. China) for natural gas supply. Therefore, the development of these expensive pipeline projects together with the long-term contracts provide guarantee for the future supplies of natural gas to the region.

4. *The development of new natural gas resources:* The persistence of long-term contracts not only favours the construction of major gas infrastructure, but also provides an incentive to the gas-producing countries for developing new resources. But long-term contracts alone may not be sufficient for developing new gas fields, especially when it comes to unconventional gas, which requires state-of-the-art technology for its extraction. Therefore, producer countries need to open their markets for more foreign involvement to attract the needed technology. Thus, the liberalization of the upstream sector will become increasingly important for the security of gas supplies and should be further investigated in subsequent editions of this report.

4. EFFECT OF LIBERALIZATION ON DEMAND AND SECURITY

According to economic theory, if prices drop consumption should rise, and vice-versa, in line with price elasticity. Various forms of energy have different patterns of price elasticity. In transport, there is some evidence of a degree of short-term price elasticity, but the effect disappears when consumers come to consider new prices as “normal”. The situation is different for natural gas because its uses, particularly for heating, are vital. Home heating demand is increasingly inelastic as external temperatures drop, and industrial demand depends on economic activity. In the medium and long term reductions in consumption are driven by investments in efficient equipment.

In the industrialized countries of the UNECE region, the required investments have been made, but other countries in the region cannot yet afford them. For example, investments in housing, the source of significant gas demand, are split between public owners for publicly-owned collective housing and private owners for individual housing.

The liberalization of the gas market did not occur in a vacuum but rather as because of similar mindsets and principles regarding free market, competition and transparency, and in very different economic situations. When liberalization was launched in the EU, the United States of America, and Canada, it was implemented as a coherent process with other aspects of energy policy. Liberalization was considered in a wider context of energy reform policies: promotion of energy efficiency, evolution of the energy mix, regulatory framework. It also took place in countries when the other elements of a coherent energy policy did not exist. And it was often launched under different economic and political rationales.

The significant differences in gas tariffs in the UNECE region cannot be explained only on the basis of the degree of liberalization. The perception of the consequences of the liberalization covers a wide spectrum within the UNECE: liberalization, completely achieved liberalization, liberalization in an advanced stage, liberalization in an early stage, no liberalization at all.

Within the EU, despite directives guiding Governments in implementing energy policy, the implementation of liberalization has taken very different paths. While some countries (e.g. the Netherlands) fully liberalized their gas market with positive results, many others have applied the directive only tepidly with weak results in terms of competition or new entrants. Liberalization was intended to introduce a competitive framework. Market liberalization has been progressing slowly: an EU directive in December 1996 on the internal energy market was followed by the EU directive regarding the internal gas market (June 2003) and the EU directives concerning the electricity and gas internal market.

The implementation of EU directives has been patchy, too, for transport (high pressure) and distribution (low pressure). Most EU countries comply with the EU directives on energy, but the situation is far from being homogeneous. Many of them recognize that liberalization has not increased competition among the energy companies. Few domestic consumers switched to another gas supplier (less than 5% on average) because of insufficient information and complicated switching procedures.

Prices are set competitively, but the benefits for consumers are masked by a general increase in energy prices. The homogenization of the competition rules has led to similar homogeneity of commercial rules and, thus, some of the incumbent gas companies have entered neighboring markets, acting as new entrants. The result has been a progressive concentration in market structure from a series of national or sub-national monopolies to an oligopoly across Europe.

Liberalization of gas markets among CIS countries has not occurred, even though there have been tentative steps in some countries. Despite a common legacy from the former Soviet Union, the situation in the CIS varies from country to country, with a notable schism between those who produce energy and those who do not. Transit is problematic when a country is already a producer, but it makes little difference if the transit country is an energy consumer (e.g. Belarus).

The situation of the Russian Federation has to be considered specifically. Gas prices within the country for both households and industry remain low compared to average export prices. The Russian Federation does intend to liberalize its gas market, a process that would increase household prices, but this process is sensitive because of the social consequences. The situation is similar in Ukraine, though the country does not have the same levels of production.

EU directives established the principles of independent authorities to manage competition in the energy sector independent of government. Selected tools have been applied to the pricing policies of gas companies following liberalization. These tools have been designed specifically to enhance end-use energy efficiency. The trend towards setting up independent authorities has been copied in non-EU countries, particularly in industrialized ones. An independent regulatory authority is a necessary but not a sufficient condition for effective liberalization. The absence or inadequacy of fair and balanced competition rules would also need to be addressed.

Liberalization has not delivered the full panoply of information that customers need for making rational choices. It also has not succeeded in preventing anti-competitive behaviour. The low switching rates are a consequence of insufficient technical and commercial information, and, in some cases, dissuasive commercial clauses for switching for another provider. Tariff policy generally has been pro-active when directed towards customers prepared to change provider.

The formula has been used in other network activities—such as telecommunications—when a provider is ready to forego earnings to attract new costumers. In the gas sector, such approaches have been observed with industrial consumers, but much less so towards individual ones. In some EU countries, both gas and electricity have been liberalized. The result and the increase in competition have been more effective in these cases. Similar approaches for gas and electricity have strengthened the effect of liberalization by encouraging companies in one sector to enter the other.

A final judgment on the benefits of liberalization for consumers is not as positive as had been expected, but the shortfall is largely a consequence of incomplete or inadequate liberalization. Technical and economic constraints remain as well. The real benefit for consumers should be choice of suppliers offering tailored energy solutions, but the choice remains limited. It is premature, however, to conclude that liberalization is ineffective for improving efficiency. Competition appears to have had its greatest impact in the downstream, particularly on devices for gas use where commercial conditions affect users. Some strong incentives, supported by State-level policy, have been developed toward the main energy users, such as the cement industry, steel and aluminium industries. The quantities delivered and sold to these consumers are enormous and have justified energy companies' dedicating commercial and network investments to service them.

An analysis of gas prices reveals strong variance across the UNECE region. Many countries subsidize gas prices to prevent social unrest and to maintain the competitiveness of national industries. Also, several countries, particularly in the CIS region, have a single operating gas company, which is de facto and de jure a State-owned monopoly. The policies to support industries and sponsor consumers impose a special role on State authorities and set the stage for intensive lobbying by incumbent stakeholders when liberalization is on the agenda. The State must therefore give careful consideration to liberalization, whether for EU commitments or for economic reasons, while monitoring a strategic sector that contributes an important share of the public budget.

The roles for the State include creating an enabling environment that allows economically rational investment and consumption decisions, adapting regulation to market structure and ownership, monitoring pricing/tariffs and market behaviour, intervening on competition or consumer protection grounds as needed, and managing its own interests in State-owned enterprises.

Unbundling has promoted new roles for additional companies and has increased the needs and opportunities for new investments. New entrants have arrived and have invested. These additional investments have strengthened the gas chain and have contributed to increased energy security.

5. ROLE OF LNG IN GAS MARKET LIBERALIZATION

Currently at 27%, by 2030 the share of LNG in world gas trade is forecast to reach 60% of total volumes, corresponding to 18-20% of global natural gas consumption. In 2009, LNG global traded volumes equalled 162 million tons (242.8B m³). For the UNECE region, the share is about 53.5 million tons, the bulk (about 60%) being sent to East Asia. The growth forecast stems both from increased efficiency and reduced cost of natural gas liquefaction and from the high flexibility of LNG supply chains, allowing a successful variation of servicing multiple markets.

LNG is used for the same purposes as the piped natural gas:

- generation of electricity, heat energy and industrial cooling
- supply of gas to communities and industrial facilities
- fuel backup to meet peak loads
- fuel for natural gas vehicles
- raw material for the chemical industry.

The wide penetration of LNG in world markets is a result of prices that are comparable to or cheaper than the prices of liquid hydrocarbon fuels.

Since the mid-1990s, liquefaction costs have fallen by 40%, and by 2015 are expected to fall by another 10%. The downward trend is expected to continue. Capital construction costs for LNG plants at the end of the 1970s stood at US\$ 2,000 per ton of capacity, while now their costs are US\$500 (US\$ 2002). At the same time, the construction and maintenance of gas pipelines have become increasingly expensive. LNG delivery is cost competitive with piped gas when gas is transported more than 2,000 km to 3,000 km, and as the costs of pipelines rise and those of the liquefaction chain drop, break-even distances will shrink. In Western Europe LNG prices and pipeline gas prices already were equal at the start of the 2000s.

Liberalization of natural gas markets facilitates diversification of supplies and improvement of competition. It has increased transparency, access to buyers, and optimization of gas prices. Import restrictions have been lifted gradually and internal barriers have been removed to ensure availability of gas at competitive prices. While natural gas prices are determined generally by bilateral contracts between suppliers and users that are based on world oil prices, this price link will be pressured by growth of LNG trade. Today LNG can compete in price on par with oil and pipeline gas supplied to the most promising markets. A driver for development of LNG trade has been the lower commercial effectiveness of pipeline transport and growing technical and political problems of gas pipelines. Consuming countries expect to diversify their sources of supply through expansion of LNG trade. This evolution has been demonstrated clearly in the EU's gas market liberalization.

Following liberalization there is a trend to shorter contract terms without "take or pay" requirements. More flexible contract forms are common, and spot gas markets are able to develop. Even if shorter contract terms result in more instability of cash flows for gas suppliers, the instability is manageable. Despite growth in LNG's share of global traded gas, its role in future gas markets can only be enhanced when the share of long-term contracts in the international gas trade turnover falls below 50%.

At the middle of the first decade of twenty-first century, new price signals given by the gas markets encouraged gas companies to proceed with constructing planned LNG facilities. Advances in LNG technology, in particular related to the size and configuration of production trains and ships, supported those decisions. For instance, each of the 6 new LNG trains in Qatar commissioned since 2008 has a capacity of 7.8 Mt/a and the new Qatari LNG ships (Q-Max), with 260, 000 cm, are twice the size of the previous standards.

With its share in global gas trade approaching 30%, LNG has become the major factor linking the three main market areas—Asia, Europe and America. Producers and sellers have developed downstream strategies beyond shipping, have bought capacity shares—sometimes ownership—in LNG terminals, and have pursued a marketing strategy with new contracts that allow them to divert cargoes on short notice to higher value destinations. “Arbitrage” is king.

Buyers must be prepared to buy expensive spot LNG volumes at marginal prices, but they also can benefit from low prices at times of surplus. The 2008 recession, the completion of new LNG-producing plants, and the “unexpected” shale gas production in the United States, have created a glut in the market that may last some years. The United States has become self sufficient in gas due to this shale gas production. Around 100 bcm/a of existing LNG re-gasification capacity at import terminals has been idled. Construction of an 8 Mt to 16 Mt/a liquefaction plant is under study to export LNG and benefit from price differentials between Henry Hub and other markets. Arbitrage decisions favour countries such as China, India, and the Republic of Korea, who pay prices equivalent to oil and who, along with Japan and Taiwan Province of China, attract most of the LNG available. Several European companies have diverted LNG cargoes to Asia.

This new context helped gas and energy market liberalization in Europe. Because gas pipe imports dominate European supplies, competition authorities have welcomed the construction of LNG-receiving terminals to illustrate that lower cost gas from new sources is able to compete. The new installations have paved the way for newcomers entering the European gas market and developing alternative strategies of supply in competition with incumbents. Countries most affected by LNG development are Belgium, France, Spain and the United Kingdom, as well as, but to a lower extent, Italy. Other countries of the region, such as Greece, Portugal and Turkey, have existing terminal(s) on their territory, but have been minimally affected for local reasons. A new terminal is under construction in the Netherlands, and many are planned in several others countries but are still awaiting final decision. Had the economic crisis emerged later, several additional terminals would be under construction.

LNG terminals have been unbundled and operate under an open access and non discriminatory regime with regulated tariffs. To encourage new construction, the European Commission granted several projects exclusive rights. The United Kingdom followed such a strategy and, from a starting point of little re-gasification capacity just a few years ago, can now receive 40 bcm/a (45% of its annual gas demand). Had this new capacity not been built, new gas import pipes would have been needed, and would likely have imported the continent's contract infrastructure as well.

Zeebrugge is a site on the Belgian North Sea coast where there is an LNG receiving terminal, the Zeepipe coming from Norway, and the Interconnector linking Belgium to the United Kingdom. The total capacity traded or flowing through Zeebrugge is close to 50 bcm/a, roughly 10 % of EU gas demand. Not surprisingly, the first continental market was organized there, and traded volumes are increasing continuously. Prices reflect NBP prices except when Interconnector supplies are disrupted (e.g. by maintenance). The influence of LNG can be seen directly with deliveries to the Zeebrugge terminal but also indirectly via United Kingdom deliveries through the Interconnector.

European gas market liberalization is advancing with the continuing development of cross-border pipelines. The expansion of the pipeline capacity and LNG deliveries to terminals such as Montoir-de-Bretagne in France, other European hubs or market places are also witnessing prices in line with Zeebrugge—a new continental pricing scheme based on netbacks from Zeebrugge appears to be emerging, though prices do not always shift instantaneously in the same manner.

Spain also makes for an interesting study, because almost two thirds of its gas requirements are met by LNG arriving in six terminals. Further terminals are under construction. Due to difficulties in laying pipes through the Pyrenees, the Spanish gas network is relatively isolated from the European gas system. If and when new pipelines are built, one can expect stronger convergence between Iberian prices and those of the rest of continental Europe.

Annex: Structure of gas markets and pricing in the UNECE region

United States of America

Regulatory oversight of the interstate natural gas market in the United States began in the 1930s as a reaction to concerns about the possible exercise of monopoly power by interstate pipeline companies. These concerns continue to be key factors in market monitoring and regulation. However, the natural gas market has changed significantly since the 1930s, and particularly since the 1970s, as legislative and regulatory initiatives have combined with market forces to create a more competitive natural gas industry. Ceiling prices at the wellhead were increased or removed with landmark legislation in 1978 (Natural Gas Policy Act of 1978)²⁰. Contract prices for all categories of natural gas increased in the initial years after passage of the NGPA. However, as natural gas demand and petroleum prices declined, contract prices reversed this trend and generally were in decline by 1982. A key date in the NGPA was 1 January 1985, when price ceilings on most new gas were removed. Persistently abundant supplies of natural gas pressured gas prices downward.

Prices at producing wells were fully liberalized in the early 1990s, after the adoption of Natural Gas Wellhead Decontrol Act of 1989. Under NGWDA decontrol, the natural gas spot market and transportation services market expanded, while the merchant role of natural gas pipeline companies steadily declined. Under FERC Order 636, (FERC Policy on Natural Gas Gathering System Ownership Since 1992) interstate pipeline companies were prohibited from reselling gas and so no longer owned the gas they transported. Natural gas purchasers can now negotiate price provisions directly with suppliers or contract with marketers who assemble a package of services. Institutional structures such as market hubs, futures and options markets, and secondary markets for pipeline capacity rights developed to support an increasingly competitive market. Import and export trade of natural gas has increased, and numerous environmental, safety, and security measures have been implemented throughout the industry. The United States Gas Market is probably the most liberalized market today. The prices are fully liberalized and had a stable rising trend from 2003 until the onset of shale gas production in 2008. Liberalization never promised lower prices. Rather, prices are designed to reflect market supply and demand fundamentals, and they can rise or drop. Both suppliers and consumers are able to respond to changing market conditions.

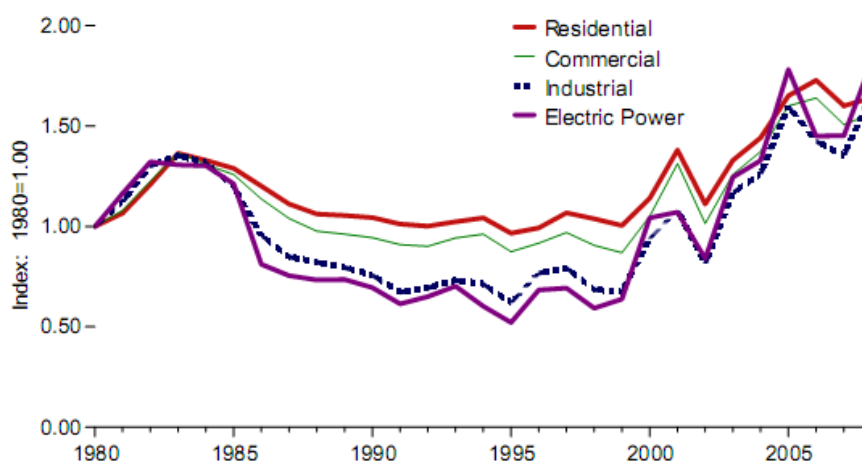


Figure 1. US natural gas prices, real, indexed, 1980 – 2008

Source: US EIA Annual Energy Review 2008.²¹

²⁰ Natural Gas Policy Act of 1978

²¹ <http://www.eia.doe.gov/emeu/aer/pdf/pages/sec6.pdf>

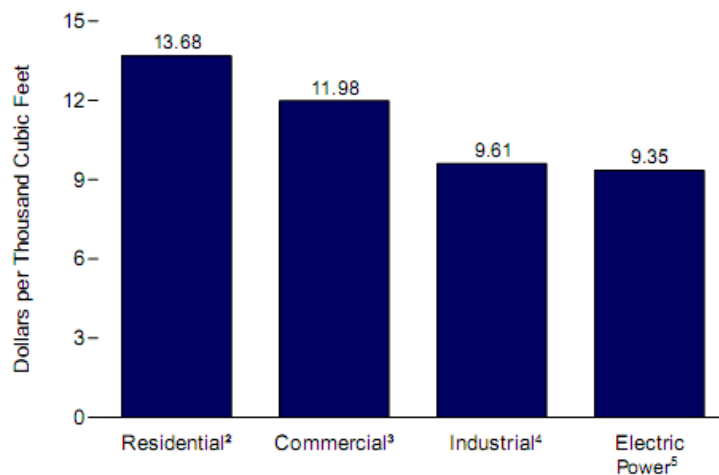


Figure 2. US natural gas prices by sector, nominal, 2008
 Source: US EIA Annual Energy Review 2008.²²

European Union

Currently, natural gas is the second most important fuel in the EU. The Green Paper on security of energy supply outlines the worrying level of dependence on gas imports from sources outside the European Union (EU). One quarter of all energy consumed in the EU is gas, 58% of which is imported. Of this, 42% comes from the Russian Federation, and around 80% of EU imports of gas from the Russian Federation pass via Ukraine. Indeed, imports are expected to increase from about 300 billion cubic metres (bcm) per year today to around 600 bcm in 2015²². All the same the indigenous production is declining steadily, making the EU more reliant on natural gas imports and, thus, more vulnerable to disruption of supplies.

This chapter seeks to examine the efforts of the Union towards achieving greater security of supplies. In this context three areas are examined: the legislative developments within the EU, the practical dimension of the security of supplies issue and the most important Community instruments for stimulating the European gas infrastructure

*Security of gas supply – legislative developments*²³

The dynamic gas market developments increased the importance of security of gas supplies. In order to strengthen the latter in the internal market the Directive 004/67/EC concerning measures to safeguard security of natural gas supplies was adopted. The two main goals of the Directive are “ensuring an adequate level for the security of gas supply, in particular in the event of a major supply disruption”, and “contributing to the proper functioning of the internal gas market...”

The internal gas market is under development. It is regulated by Directive 2003/55/EC and Regulation 1775/2005 which was revised with the proposal made in September 2007, the so-called third package on the internal electricity and gas markets. This Directive has established the common rules for the internal market in natural gas that enable Member States to take the requisite measures to safeguard supply in the event of a sudden crisis in the energy market. The Community gas market is currently being liberalized, which is why there is a growing need to guarantee the security of gas supplies.

²² Commission Staff Working Document SEC(2009) 977 final.

²³ European Council of Foreign Relations

The Russian-Ukrainian gas crisis in January 2009 caused serious disruptions of gas supplies to the Community. The Directive was not adequate to deal with supply disruptions. Hence, on 16 July 2009 the European Commission adopted a proposal for a regulation concerning measures to safeguard security of gas supply, repealing Directive 2004/67/EC. And as the Commission proposed a regulation rather than a directive, the provisions would be directly applicable to Member States and gas undertakings. Member States would be required to designate a competent authority to be responsible for security of gas supply. Such competent authorities would be responsible for monitoring security of gas supply at national level, assessing risks to supplies, establishing preventive and emergency action plans. They would be coordinated by the Commission at the Community level through the Gas Coordination Group.

Under the draft regulation, each competent authority would be required, by September 2010, to assess the risks affecting the security of gas supply in its Member State. Moreover, they would have to establish, by March 2011, a preventive action plan which must contain the necessary measures to mitigate the risks identified and an emergency plan containing the measures necessary to mitigate the impact of a gas supply disruption. But, before adopting such plans, the competent authorities are required to consult the Commission. The Commission will assess the plans of all Member States and would have the power to require a revision if considers that they are not effective or they do not comply with this regulation.

On 20 January 2010, the European Economic and Social Committee (EESC) issued an opinion that the responsibilities for the security of supply must be clearly allocated to national public authorities, the Commission as well as to private organizations and companies. The EESC calls for small-scale consumers and household consumers to be given special protection in the event of a disruption to supply. Moreover, Member States in breach of their security of supply obligations should face penalties. While it broadly supports the Commission's draft regulation, the Committee insists on the need to reconsider gas market liberalization policy as it has failed to produce greater investment in clean energies, or achieve a diversity of supply. The EESC underlines that the effectiveness of all schemes aimed at ensuring the security of supply will depend on solidarity between the Member States and their willingness to cooperate with one another. In this context, the Commission's powers in emergency situations need to be strengthened so as to prevent any harmful unilateral decisions.

Security of gas supply – practical aspects

The concept of security of gas supply has two main aspects: long-term and short-term security. The long-term security concerns the EU's ability to ensure a reliable and economic supply of efficient energy and the short-term security means the avoidance of interruptions of contracted gas supply and guarantee for customers to receive their gas supply in fulfilment of their contracts. For both aspects the following factors are of big importance: the availability of gas and transportation capacity.

There are also two interrelated aspects of EU gas security: dependence on imports and diversity of gas supply

1. Dependence on imports

EU Member States vary considerably. The EU's eastern national gas markets are, for the most part, small but highly dependent on the Russian Federation, whereas the bigger western markets benefit from greater supply diversity. And while the countries that critically depend on the Russian Federation for their gas are to be found among the new Member States, Gazprom's big clients are Germany and Italy, which together account for almost half of all Russian gas consumed in the EU. Gas import dependency is around 100 % in 15 Member States, e.g. all or nearly all gas is imported.

Only two countries are gas net exporters – Denmark and Netherlands. Ireland, Greece and Portugal started to use gas only after 1990.

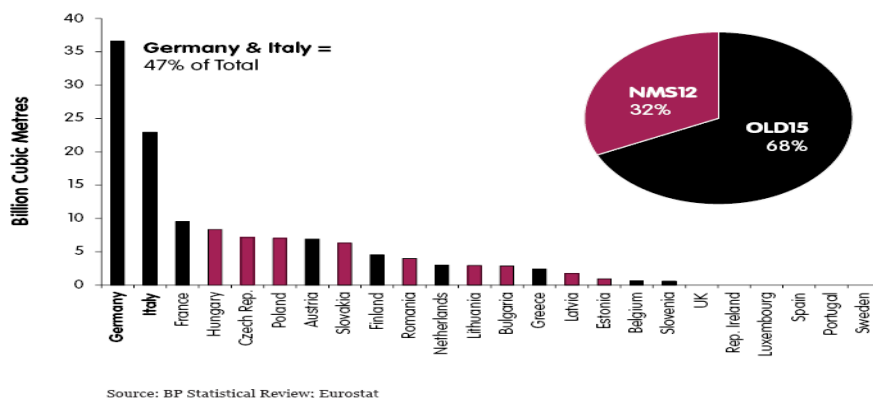


Figure 3. Gas imports from the Russian Federation (2006)

These national differences would not matter too much if there were a single European gas market. But the reality is that Europe’s gas market is segmented along national lines. There is little cross-border trading within the EU, and when supply disruptions occur (such as those during the gas crisis of January 2009) there is very little reallocation of supply between national markets.

Integration and liberalization of Europe’s gas market would enhance the security of gas supply, particularly in Central and Eastern Europe, where some countries are heavily reliant on gas imports/. Indeed, six of the EU members from that region import more than 80% of their gas supply from Russia. However, the successful implementation of gas market liberalization is a medium-term prospect, depending on political and industrial processes over which Governments in the new Member States have little control. In the short term, a more direct approach is needed to address gas security issues in the most exposed EU Member States.

In the future, three producing countries (Russian Federation, Norway and Algeria) will continue to provide a huge share of European gas imports. At present, almost 10 per cent of the EU supplies come from other import sources such as Egypt, Libya, Nigeria, Qatar and Trinidad and Tobago.

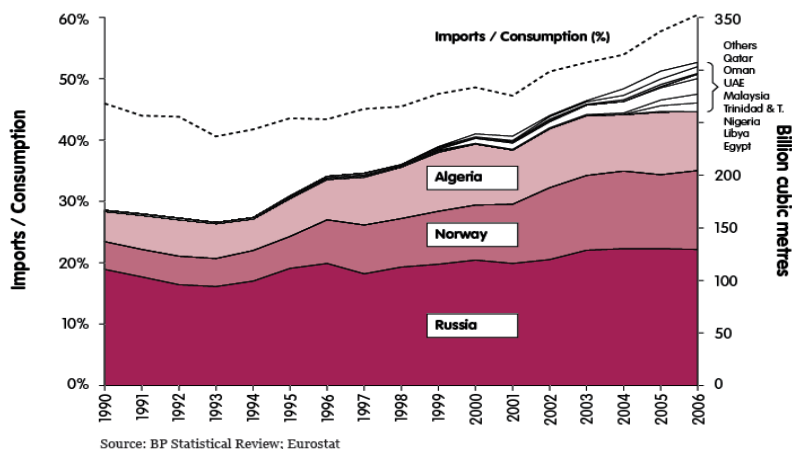


Figure 4. EU27 gas imports, 1990–2006

2. Diversity of gas supply

The result of liberalization and opening markets to competition has been an increase in the number and diversity of players. The key players on the European gas markets are on the one hand the Governments, liberalizing their markets and implementing gas directives. On the other hand, there are national gas incumbents, facing the end of their monopoly positions and preparing for the forthcoming European competition. As the national gas incumbents have to deal with the opening of their own national gas markets and the potential threat of competition, they are expanding geographically and vertically to exploit global growth opportunities offered by horizontal and vertical integration of the European level.

Member States who depend only on one gas supplier could diversify their gas portfolio to at least two different gas supply sources. Eight Member States (Sweden, Finland, Ireland, Latvia, Lithuania, Estonia, Bulgaria, and Slovakia) fully depend on gas imports from only one gas supplier. In addition, Finland, Latvia and Lithuania do not have any indigenous productions. Bulgaria, Ireland and Slovakia have only marginal domestic production. Meanwhile, in Spain and Portugal it is stipulated in the national legislation as an obligation, to have maximum 60% of gas supply from one supplier.

Romania has also only one gas supplier, but an important domestic production covers more than half of its gas demand. At the same time, Poland, Czech Republic, Hungary, Austria, Slovenia, Greece, United Kingdom and Italy have diversified their gas supplies by constructing additional pipeline connections in the last 15 years.

Portugal, Greece and Ireland introduced natural gas into their energy mix only in the last 15 years. Portugal and Greece diversified their gas supplies by constructing LNG terminals, and Ireland, Netherlands, Germany, Poland, and Sweden are also planning to acquire greater liquefaction capacities.

Indeed, LNG represents another possibility for the European gas market in the context of diversification of gas supply and supply routes. LNG projects, as a form of gas supply to Europe, are becoming more and more competitive and have a growing importance for Europe. The higher flexibility of LNG, which allows gas importers to diversify their suppliers and supply routes, is one of the main differences of LNG with pipeline supply, which is bound by asset-specific infrastructure availability. LNG also contributes to the development of financial viability of areas, which were difficult to access via gas pipelines. As most gas reserves are located far away from EU markets, it is clear that LNG will play a key role in bringing this gas to the market, when distance or natural or political obstacles make pipeline transport impossible. Of the EU external supplies, 7.8 per cent were in the form of LNG. France and Spain are among countries that have chosen LNG in order to diversify their geographical reliance on natural gas. Countries such as the United Kingdom, Italy and Belgium followed them.

The development of gas infrastructure

There are many projects throughout Europe to build new or to expand existing pipelines and storage facilities, including interconnections. The investment in infrastructure for gas import via regasification terminals and pipelines is also necessary as is to invest in downstream infrastructure, whereby natural gas reaches most of the customers.

The basic financial instrument supporting the European gas infrastructure is Trans-European Networks for energy infrastructure (TEN-E) programme. It supports projects aiming at developing natural gas networks and/or ensuring their interoperability within the Community and with countries in accession and candidate countries and other countries in Europe, in the Mediterranean Sea, Black Sea and Caspian Sea basins, as well as in the Middle East and Gulf regions. The ultimate goal is to achieve market integration and diversification of natural gas sources and supply routes. A project of strategic importance under the TEN-E programme is the Nabucco pipeline, which will bring Caspian

gas to the European market. Other projects concern the development of intersystem connectors between the gas-transportation grids of EU Member States .

Furthermore, for the first time in the history of EU the Financial perspective for 2007-2013 allow for the financing of gas infrastructure projects through the Structural funds (European Regional Development Fund). Two special categories are defined for funding under this source: Category 36 “TEN-E gas” supporting big interconnection projects and Category 35 “Natural gas” supporting other projects, which are not TEN-E projects, such as gas distribution networks and underground gas storage facilities.

The European Bank for Reconstruction and Development (EBRD) also provides funding for gas infrastructure projects, though these are relatively few and within countries outside EU focuses on the development of private sector and finances relatively few gas infrastructure projects. Pipeline financing by EBRD has increased in the recent year in particular for Ukraine (three gas pipeline projects) and Azerbaijan (two gas pipeline projects). This is also seen as contributing to the overall European energy security.

Gas distribution in most of Europe was developed by regional and local authorities in the form of local distribution monopolies for a variety of reasons including historical (pre-existing manufactured gas), economic (character of natural monopoly of networks) and social (captive consumer protection). Some countries, notably France, the United Kingdom and Spain, chose to integrate distribution with their gas transport monopolies.

Until the end of the 1990s, the European gas market was organized around an oligopoly of producer-exporters (public companies in Algeria, Norway, the Russian Federation and the Netherlands) and an oligopsony, including gas companies in European countries that held monopoly or quasi-monopoly positions in their national wholesale markets.

Relations between the production oligopoly and the national import monopsonies were structured as risk-sharing contracts of 20-25 year durations. Key elements of this risk sharing were:

- ‘Take or Pay’ clauses
- ‘Final Destination’ clauses
- Prices set by a ‘netback’ formula, linking gas prices to oil prices on the national market with 6-month re-sets.

This market model enabled regular growth in gas demand, development of gas pipeline infrastructure from source to use, and sensible exploration, development, and production in gas producing regions. End-use prices were regulated by Governments, based on import prices plus operating costs. As a result, gas prices were generally stable for all categories of consumers. The gas industry was satisfied inasmuch as the major actors worked out trade and transit provisions bilaterally with no serious problems. Over time, however, this model was seen as not being in line with the EC's market vision and competition principles.

The EC identified three principal issues: insufficient internal market development, non-competitive markets, and abuse of dominant positions. Moreover, the structure was considered an obstacle to development of gas consumption. The gas pricing formulae targeted end-use markets in which oil products were the alternative competing fuel, whereas power markets needed a different price relationship. Further, prices paid by end-users for natural gas bore no relation to the cost of producing and delivering the gas. Natural gas demand was said to be ‘booming’ all over Europe, with the all-around optimism fed by numerous structural economic and political developments. The main factors restraining the use of natural gas are under pressure to change.

It has become clear that natural gas reserves, on both European and global scales, are abundant. Since 1985, natural gas prices have declined—the fall in oil prices and the depreciation of the United States dollar have reduced end-user prices within all European countries. And since 2008, the development of shale gas in the North American market has shifted global LNG markets, with corresponding impacts on European gas markets. It is possible that shale gas developments in Europe will have further consequences. The low sulphur and carbon content of natural gas compared

with other fossil fuels makes it an attractive fuel from an environmental perspective. These developments make natural gas more attractive than alternative fuels like coal and lignite.

The liberalization of the United Kingdom's electricity market and the development of highly efficient combined cycle gas turbines (CCGT) stimulated the use of gas for power generation. Further liberalization of continental European electricity markets would likely stimulate more demand for CCGTs and, hence, for natural gas.

In the EU, the market structure remains still quite concentrated. The number of non-incumbent companies with over 5% share of production or import capacity is quite low in almost every EU country, and there were no changes in 2007 from 2006. The share of the three biggest companies in every EU country is very high and reaches 100% in half of the EU. The share of the three largest wholesalers is also above 90-95% in most EU countries. The EU retail market is more competitive and the number of independent suppliers is growing. However, in some countries there are few or no independent suppliers at all (Finland, Greece, Spain, e.g.). There are more companies with over 5% share in retail markets than in wholesale markets but the number is still low. Twelve TSOs (about 25% of the total number) and 620 DSOs (42% of the total number) have been unbundled.

In the EU, TPA systems and charges vary widely from one country to another. Approximate network tariffs for large users vary from 0.101 €/kWh in France to 0.68 €/kWh in Finland; tariffs for medium commercial users vary from 0.131 €/kWh in Spain to 1.44 €/kWh in Greece; and tariffs for households vary from 0.118 €/kWh in Germany to 2.86 €/kWh in Slovakia. Despite liberalization, gas prices are still rising on average in the EU area (around 5% growth from 2007 to 2008) and there is no obvious link between the degree of liberalization and price movements. For example in the United Kingdom, Germany or Austria, prices grew more than the European average, whereas in France, Portugal or Romania they grew more slowly.

In EC communications of 10 January 2007, in both the Internal Market report and the Energy Sector Enquiry, the EC addressed a number of issues to be resolved, possibly by introducing new legislation:

- Market concentration and market power
- Vertical foreclosure (inadequate unbundling of network and supply)
- Lack of market integration (lack of cross border regulatory oversight)
- Lack of transparency
- Price formation mechanisms
- Downstream markets for gas
- Balancing markets
- Liquefied natural gas (LNG) markets.

Current legal and functional unbundling is considered insufficient to remove the conflicts of interest arising from vertical integration. A vertically integrated company has incentives both to under-invest in new networks (fearing that such investments would help competitors to thrive in "its" home market) and to privilege its own sales companies when it comes to network access. The regulatory framework and the powers of the regulators would need to be strengthened to ensure the transparency, stability and non-discrimination needed for competition and investment. Better coordination of national regulators at European level would assuage the market segmentation caused by regulatory differences among Member States. The options would be to improve the present approach while relying on voluntary agreements among 27 national regulators (often with different interests), to augment and formalize the role of the European Regulators Group for Electricity and Gas (ERGEG) into a European Network of Independent Regulators (EREGG +), or to establish regulatory body at Community level.

Improving cooperation among transmission system operators (TSOs) to enable free circulation of gas and electricity within the EU would require compatible technical rules and regular exchanges of information, increased investment in networks and cross-border interconnections, and creation of regional system operators. Traditional operators held national or service territory monopolies before

liberalization. The lack of market integration, the continuing national character, and the significant barriers to entry expose both gas and electricity markets to a risk of abuse of dominant positions.

Ensuring efficient market operation, including consumer protection and public service obligations, are an integral part of opening gas and electricity markets: the right to relevant information on the different suppliers and supply possibilities, the right to a straightforward procedure for changing supplier, protection against energy poverty for the most vulnerable consumers, protection against unfair commercial practices, etc. Greater transparency, recourse to the 'use-it-or-lose-it' principle, genuine access to gas storage facilities and maintenance of incentives in favour of new storage capacities would facilitate the transition to a more competitive gas market.

Creating a stable environment for investment would encourage new entry. Other factors may influence investment, such as the award of emission certificates or specific incentive measures, for example for production of electricity from renewable energy sources.

History of the EU legislation on gas market liberalization

First legislative package. The EU Gas Directive was approved by the European Parliament in June 1998 and entered into force on 10 August 1998. The main provisions were:

- The right of access to the network for direct purchases by producers of electricity, eligible consumers and distributors.
- A minimal level of 20% opening in 2000, 28% in 2003 and 33% in 2008 (by reduction of threshold consumer eligibility from 25 mcm/year in 2000 to 5 mcm/year in 2008).
- Third party access to the network with choice between negotiated or regulated third party access (TPA) both for transport and access to LNG terminals and for distribution and price system with three main models: postage stamp tariffs, distance-related tariffs, and 'entry-exit' tariffs.
- An accounting and functional separation of transport activity within gas operators under the control of regulators or authorities in charge of competition.
- Definition of appropriate and effective mechanisms of regulation, control and transparency.

Second legislative package. The 1998 Directive and the transposed international laws, had only limited effect on competition until 2001. According to the EC, this limited impact was a consequence of persistent vertical integration, prohibitive prices for network access and storage, and insufficient separation between gas trading and transport and storage. A new Directive was adopted in 2003 to address these concerns. In order to ensure non-discriminatory access to the network and avoid conflicts of interest it was considered necessary to separate the network business (natural monopoly) from those activities of vertically integrated companies, which compete on the market, namely production and supply, a process known as unbundling²⁴.

The possible approaches to unbundling included:

1. Legal unbundling of the transmission system operator (TSO) and distribution system operator (DSO) from other activities not related to transmission or distribution.
2. Functional unbundling of the TSO and DSO, in order to ensure its independence within a vertically-integrated undertaking.
3. Possibility of exemptions from the requirement of legal and functional unbundling for DSOs.
4. Accounting unbundling: requirement to keep separate accounts for TSO and DSO activities.

²⁴ http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/implementation_notes/unbundling_en.pdf

Legal unbundling

Legal unbundling requires that transmission and distribution be managed by companies that are legally distinct from other companies involved in non-network gas and electric activities. The network company are not obliged to own the network assets but must have “effective decision making rights” in line with the requirements of functional unbundling. The obligation to create a separate company only concerns the network business, i.e. the natural monopoly. All other activities, namely supply and production, can continue to be operated in one single company.

Functional unbundling

The provisions of the Directive on management separation require that the staff of the network business do not work for the supply/production company of the vertically integrated company. This limitation applies both to executive management and to operational (middle) management. The company involved in the network business may not hold shares of the related supply, production or holding company. Further, management's personal shareholdings must be arranged to ensure its independence.

TPA. Tariffs for access to the natural gas transmission networks²⁵

The Directive requires that tariffs and/or the methodology by which they are calculated (or derived) be applicable to all system users on a non-discriminatory basis. Non-discrimination requires that comparable situations be treated similarly, unless there is an objective difference in service levels and/or costs. Tariffs/methodologies for identical services offered by a TSO must be identical.

An entry-exit tariff system is considered to ensure non-discrimination. The price of capacity at an entry or exit point is the same for all network users at that specific entry or exit point. The tariff for each entry and exit point must be objective and non-discriminatory.

The provisions of the Regulation²⁶ and Directive aim at providing efficient and non-discriminatory access to the system. Efficient access implies access tariffs that reflect underlying, efficiently-incurred costs. Unduly high tariffs that do not reflect underlying costs may act as a barrier to entry and thus restrict competition. Further, non-discriminatory access for companies with supply and network affiliates also calls for cost-based tariffs to ensure that incumbent suppliers do not benefit from unfair competitive advantage.

It follows from the Regulation, as well as from the Directive that the starting point for access tariffs to the networks is based on the underlying costs of providing the service. Where appropriate, benchmarking of tariffs may be taken into account. The Regulation further allows for market-based mechanisms to determine the tariffs, for example through auctions. Regardless of the way in which the tariffs (and/or their methodologies) are determined, in all cases ex-ante regulatory approval in line with the provisions of article 25(2) of the Directive is required. Further, the Regulation requires the tariffs or methodologies to calculate them to provide incentives for investment and the maintenance or creation of interoperability of transmission networks.

²⁵ Commission staff working document on tariffs for access to the natural gas transmission networks regulated under Article 3 of Regulation 1775/2005. SEC (2007) 535. Brussels, 20.4.2007. - http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/sec_2007_535.pdf

²⁶ Regulation (EC) No 1775/2005 of the European Parliament and of the Council of 28 September 2005 on conditions for access to the natural gas transmission networks, OJ L 289 of 3.11.2005

Market opening: operator market shares, consumer eligibility²⁷

Market opening for all non-domestic consumers from July 2004 and all consumers in July 2007 required a series of measures to enable new operators to serve newly eligible customers, and inversely to provide small consumers genuine choice of supplier and to encourage their active participation. Consumers would thereby influence suppliers through their choices, bringing forward innovation, diversity and the improvement of products and services, in terms of both quality and price. The needed procedures involve among other things consumer information, metering, simple procedures for changing suppliers, and settlement among suppliers.

Consumer information

Clear and complete information for consumers is one of the characteristics of efficient markets. New entrants may conduct marketing campaigns, but neutral and appropriate information provided by an independent body would be needed. Information at national or regional level would inform consumers of their rights, mentioning expressly that the procedure for changing supplier is simple and free, that there are no increased risks to supply or quality, and that there is a supplier of last resort.

Competent authorities should draw up guidelines relating to:

- Simple and flexible procedures enabling customers to change supplier without charge.
- Metering of consumption, including designation of who is responsible at what cost.
- Transfer of ownership of meters.
- Definition of load profiles and their application thresholds (if data are not available, procedures for collection).
- Settlement procedures (financial compensation).
- Service quality standards, which may be accompanied by financial incentives and penalties.

The competent authorities may also:

- Designate a supplier of last resort.
- Define new functions for the meters.
- Encourage the introduction of new technologies enabling more sophisticated metering of consumption, which will facilitate opening up to competition.

Regulation

The Directives imply a new set of minimum standards for a regulatory authority to determine network access conditions. This approach would oblige a change in practice in some Member States. To comply fully with the Directive, a regulator should have the responsibility, resources and information to enable it to:

- Approve a suitable methodology for access tariffs.
- Approve either the structure of the balancing market, or the methodology for setting fixed charges for the purchase and sale of balancing energy.
- In some cases, determine rules for allocation of costs for unbundled businesses and to take an active role in setting out the requirements of the compliance audit.
- Determine and implement rules for the transparent and non-discriminatory allocation of

²⁷ Note of DG Energy and Transport on Directives 2003/54/EC and 2003/55/EC on the internal market in electricity and natural gas. Practical measures for distribution resulting from the opening up to competition.16.01.2004. - http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/implementation_notes/distribution_en.pdf

- congested infrastructure, especially those affecting capacity between Member States.
- Carry out an audited account of the use of any revenues from capacity allocation mechanisms.
- Be involved in the investment decisions of network operators through the revenue-setting procedure and to decide (with Member States if appropriate) on possible exemptions for third party access for new investments.
- Cooperate closely with competition authorities.

There are a number of additional areas where a regulator may assume responsibility. In particular:

- Monitoring and reporting to the Commission on security of supply issues.
- Deciding on exemptions to TPA relating to old take-or-pay contracts.
- Acting as dispute settlement authority for the upstream gas industry.
- Issuing, amending and policing the licenses of generator, gas operators, network companies and retail suppliers., nature, mission and role of the regulator.

Third legislative package

The third step in liberalizing EU gas market was adopted by European Commission on 19 September 2007 and will come into force on 3 March 2011. Under this package the Commission proposes to:

- Continue work on separating production and supply from transmission networks (unbundling).
- Facilitate cross-border trade in gas.
- Establish more effective national regulators .
- Promote cross-border collaboration and investment.
- Enhance market transparency on network operation and supply.
- Improve solidarity among EU countries.

The new legislative package includes 1 Directive and 2 Regulations

Directive 2009/73/EC of the European Parliament²⁸ establishes common rules for the transmission, distribution, supply and storage of natural gas. It lays down the rules relating to the organization and functioning of the natural gas sector, access to the market, the criteria and procedures applicable to the granting of authorizations for transmission, distribution, supply and storage of natural gas and the operation of systems.

The Regulation on conditions for access to the natural gas transmission networks²⁹ aims at setting non-discriminatory rules for access conditions to natural gas transmission systems, LNG facilities, storage facilities; as well as facilitating the emergence of a well-functioning and transparent wholesale market with a high level of security of supply in gas and providing mechanisms to harmonize the network access rules for cross-border exchanges in gas.

The second Regulation³⁰ establishes an Agency for the Cooperation of Energy Regulators,

²⁸ Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0094:0136:EN:PDF>

²⁹ Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0036:0054:EN:PDF>

³⁰ Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0001:0014:EN:PDF>

with binding decision powers, to complement National Regulators. The agency will have decision-making power to review "on a case-by-case basis" decisions made by national regulators and ensure there is enough cooperation between network operators. The agency's powers will be strictly limited to cross-border issues and is not a substitute for national regulators. The agency is intended to ensure proper handling of cross-border cases and enable the EU to develop a real European network working as one single grid, promoting diversity and security of supply.

Cooperation between national TSOs, which currently takes place only on a voluntary basis, will be formalized under the Commission's plans, through the establishment of a European Network for Transmission System Operators. It will have three core tasks:

- Developing harmonized standards for how companies access the pipelines and grids (common procedure for booking and allocating network capacity).
- Ensuring co-ordination, especially in the case of electricity,
- Allowing synchronous network operation and avoid possible blackouts, and coordinating and planning network investments.

Finally, market participants will come under stricter scrutiny as they will be forced to keep records of their daily operations to help possible market-abuse enquiries.

What does the third Directive change?

Clearer unbundling between operation of transmission systems and production or supply activities must be introduced to ensure that operators maintain, operate and develop the networks in the general interest of network users. To achieve this, the Commission proposes two options:

Ownership unbundling

This option, which is the Commission's clear preference, would prevent companies involved in transmission of gas and electricity from being involved in energy generation or supply at the same time. In other words, such companies would be obliged to sell part of their assets. Shareholders would be able to keep their participation in the dismantled groups via a system of 'share-splitting' where they are offered equivalent shares in the successor companies.

Independent System Operator

Faced with a veto threat from nine Member States that expressed their opposition to full unbundling, the Commission proposed a possible "derogation" in the form of a "fully independent system operator" (ISO). Under this second option, companies involved in energy production and supply would be allowed to retain their ownership of network assets, but would lose control over how they are managed with all commercial and investment decisions left to an independent company (the ISO) to be designated by national Governments.

Lack of coherence in the powers and remits of national energy regulators was identified as one of the biggest hurdles towards a well-functioning EU energy market. The third liberalization package aims to resolve this by:

- Harmonizing and strengthening the powers and duties of national regulators so that they are able to issue binding decisions on companies and impose penalties on those that fail to comply.
- Ensuring that all national regulators are truly independent of industry interests and government intervention. This means that they will have authority over their own budgets and that strict rules apply for management appointments, and.
- Mandating all national regulators with a binding requirement to cooperate with each other.

Turkey

Turkey is among the biggest countries in the UNECE region and as such has a substantial natural gas consumption. The country used 36.8 bcm of gas in 2007, 97% of which were satisfied through imports, while the remaining 3% were covered by indigenous production. Of the consumed quantities, 20 bcm were used for power generation, some 8 bcm in the industrial sector, while another 8 bcm were used for residential needs.

In 2008, Turkey imported 37.3 bcm of natural gas. This oversupply is the result of a great number of long-term contracts that the country had signed with gas-producing countries under the “take or pay” clause. Currently, Turkey is importing natural gas from six countries: Algeria (LNG), Azerbaijan, Iran (Islamic Republic of), Nigeria (LNG), Russian Federation and Turkmenistan.

The most significant player on the Turkish natural gas market is the State-owned company BOTAS, which has a dominant position in gas imports, trade, transmission and storage services. Despite the fact that 78 % of the wholesale/import sector is legally open to competition, private participation in it accounts for only 10-12%. The rest of the market is controlled by BOTAS. Nevertheless, the company was required to transfer its import contracts to the private sector and unbundle its natural gas services by the end of 2009. BOTAS is also the designated TSO in Turkey and owns the transmission network in the country. Furthermore, it also owns one of Turkey’s two LNG terminals in Marmaris (the other in Izmir is own by “Ege Gaz A.S.”). Finally, BOTAS together with TPAO (Turkish Petroleum Inc.) has recently constructed an underground storage facility in Istanbul.

Unlike the wholesale sector, the retail market (gas distribution) in Turkey is developing much faster. In 2003, when only six cities were offering natural gas, in 2009 53 distribution regions were tendered. Fifty-one of these new distribution companies started their investments in their related distribution zones. The rapid growth of the gas distribution sector is attributed to the Government's very effective gas-distribution promotion scheme.

The natural gas market in Turkey is governed by the Energy Market Regulatory Authority (EMRA). Since 2001, this body aims at liberalizing the natural gas sector by promoting privatization, competition and security of supply, by creating stable prices, and by eliminating cross-subsidies.

Liberalization

Since Turkey is a candidate for EU membership, it has drawn up its natural gas legislation in conformity with the European standards. In that context the Natural Gas Market Law, which came into force in 2001 and the secondary legislation issued by EMRA with regard to this law, have been modelled upon the EU *acquis communautaire*.

With these legislative acts serving as the backbone of liberalization, the Turkish natural gas sector has undergone a marked reformation in the past seven years including:

- Regulating the market by requiring separate licence for engagement in any natural gas activity.
- Preventing monopoly through the limitation of gas sales with 20% of annual gas consumption for each legal entity (directed to BOTAS, which is required to conduct tenders to transfer its existing natural gas purchase and sales contracts to other entities until its imports are brought down to 20% of annual consumption).
- Unbundling of BOTAS activities by the end of 2009 (Gas release programme requires BOTAS to gradually transfer its import contracts to private enterprises through a tendering process).
- Granting the right to companies to build new pipelines in order to achieve competition in the gas transportation sector.
- Establishing “eligible” consumers (threshold is 1 mcm/year).

- Implementing privatization and stimulating the market development of the natural gas distribution within the country.

Turkey has made remarkable progress towards achieving natural gas market liberalization, especially in the gas distribution sector, where the country's privatization model has proven very successful.

Concerning the wholesale segment, legal steps have been taken to diminish BOTAS's dominant position on the market and create a real competition. Nevertheless, what remains as a main obstacle towards achieving a competitive market is the situation of oversupply of natural gas that currently exists in Turkey due to the many long-term agreements with gas producing States. Because of the current surplus in supplies it is not economically feasible for new traders to enter the wholesale market of the country.

Security of supplies

The strategy of Turkey regarding the security of gas supplies is different from that of other States in the Southern UNECE region. In fact, the country seeks to use its strategic geographic location in order to become a crucial factor for the realization of the European energy security, something that may also help Turkey's bid for EU membership.

There are a number of pipelines that already pass through the territory of the country: West Pipe and Blue stream bring natural gas from Russia, Eastern Anatolian Gas Pipeline transports the energy source from the Islamic Republic of Iran, while gas from Azerbaijan is supplied by the Baku – Tbilisi – Erzurum pipeline. At the same time, Turkey is involved in a number of forthcoming pipelines including the Nabucco project, which aims to bring Caspian gas to the EU. The country also participates in the development of the Turkey-Greece-Italy connection. Turkey is also works for the realization of the Arabian pipeline, which will supply natural gas from Egypt through Jordan and Syria.

Adding to these pipeline projects, Turkey also has one gas storage facility and is planning to develop a second one. Last but not least, the two LNG terminals of the country provide further diversification of the sources and the routes of supplies of natural gas.

Russian Federation

The Russian Federation is a major global energy market player—Gazprom being the largest company in terms of the natural gas reserves. As at 31 December 2008, its gas reserves were estimated at 33.1 trillion m³. According to PRMS international standards, the company's proven and probable hydrocarbon reserves were estimated at 27.3 billion tons of fuel equivalent worth US\$ 230.1 billion. With 17 per cent of global gas production, the company is one of the world's leading gas exporters.

As regards internal energy consumption, energy efficiency is currently a major issue for national decision makers. Effective use of resources is recognized as a key factor in ensuring the competitiveness of various branches of the country's economy. Meanwhile, the energy capacity of that economy is much higher than the world average.

The country's share of natural gas in the national fuel and energy balance is still over 50 per cent. At the same time, there is significant potential for growth in domestic gas saving. "Gazprom Group" considers gas saving to be an important objective and has been making efforts to reach it. The 1997 Presidential Decree³¹, dedicated to the basics of gas pricing, became an important factor for the further evolution of the domestic gas market. As envisaged by the Decree, the State is to control only the natural monopoly-related operations such as transmission and scheduling of

³¹ President of Russian Federation Decree "On Basic Provisions of Structural Reforms Relating to Natural Monopolies" № 426 as of April 28, 1997.

supplies. Further reform of the Russian gas market was outlined with the issue of Russian Government Decree № 1021³², setting forth the main provisions for State regulation of gas prices and gas transmission. It should be noted that the monopoly in gas production was removed in the early stages of Russian economic reforms in the beginning of 1990s. The Russian gas market reforms were aimed at creating conditions for more efficient supply of gas to Russian consumers, including:

- Strengthening State regulation in gas transmission.
- Promoting competition in potentially competitive areas of economic activity accompanied by a corresponding gradual slackening of State regulation.
- Developing contractual relationships between gas suppliers and consumers.

Starting from 2000, the Russian gas market developed with a focus on:

- Developing a two-segment market model to stimulate the growth of the non-regulated segment by increasing the share of independent market players and through the establishment of an electronic trading platform (ETD) at Mezhhregiongaz LLC.
- Developing the market's commercial infrastructure.
- Reducing, in stages, the cross-subsidization of various consumer categories within the framework of the regulated wholesale price through improvement of the pricing system of natural gas used for various needs.

Further liberalization of the Russian gas market began with the Russian Government Decree³³, which stipulated that "from January 1, 2010, contract supplies (including long-term contracts) of gas produced by Gazprom open joint stock company and its affiliated bodies to all consumers (excluding the population) is to be based on wholesale prices to be determined using the gas price formula". The wholesale gas price formula is based on the principle of ensuring equal returns for gas supplies to the domestic market and gas exports.

Over the last 10 years, the Russian gas market has developed with a focus on 3 areas that largely affect Gazprom JSC:

- Separation of the natural monopoly-related activities (transmission and distribution) from the potentially competitive ones (production and sales).
- Improving the corporate management structure of Gazprom JSC to optimize the management system for core activities, increase transparency and efficiency of the Company's operations as a vertically-integrated entity.
- Improving the gas pricing system.

The first and second goals were successfully achieved. From 1 January 2001, all organizations engaged in production, transmission and sales of natural gas maintain separate accounting for their products / services and for the associated costs for the following operations:

- Natural gas production
- Services relating to transmission of natural gas via pipelines
- Natural gas storage
- Services relating to gas supplies (sales).

³² Russian Government Decree "On the Basic Provisions for Setting and State Regulation of Gas Prices and Tariffs for Gas Transmission Services on the Russian Federation Territory" № 1021 as of December 29, 2000.

³³ Russian Government Decree "On Improving State Regulation of Gas Prices" № 333 as of May 28, 2007.

In 2005, Gazprom JSC initiated reforms aiming to enhance efficiency of the company's operations as a vertically integrated entity, to optimize and expand the capacity of the entire structure managing the core activities at the subsidiaries level.

As a result of the structural reform at Gazprom JSC³⁴:

- Gas production became concentrated in specialized production companies.
- Gas transmission services via the UGSS became concentrated in specialized gas transmission companies (transgas).
- Underground gas storage was handed over to the specially-established Gazprom UGS LLC which united the 24 operational underground gas storage facilities.
- The services relating to complete overhaul of UGS wells were handed over to a specialized company.
- All gas distribution networks and assets were handed over to the specially-established Gazpromregiongaz JSC.
- Non-core activities were handed over to specialized holding companies.
- Maintenance units servicing primary production were structurally subordinated to subsidiaries.
- Social infrastructure facilities were separated from primary production.
- NGV refuelling compressor station networks were united into Gazpromavtogaz.
- Energy facilities, telecommunication services, etc. were handed over to specialized holding companies.

Therefore, in the Russian Federation, the market liberalization and demonopolization process boils down to an organizational / legal separation of operation types (production, transmission, storage, distribution and sales) in the gas sector.

Technological features of the UGSS functioning necessitate concentration of such operations as gas production, transmission, storage and wholesale within the framework of a single company.

State regulation of the Russian gas market is performed by:

- The Federal Tariff Service – as related to determination of wholesale gas prices, tariffs for gas transmission via gas mains and distribution pipelines, rates for supply and marketing services.
- The Federal Antimonopoly Service – as related to compliance with the antimonopoly legislation.
- The Federal Mines and Industry Inspectorate – as related to regulation, control and supervision in the field of industrial safety and, within its competence, in the field of mineral resources use, conservation, etc.

The State function of determining the annual consumption of natural gas and substantiating the projected consumption volumes is performed by competent authorities in the Russian regions (the regional fuel and energy committee, the regional energy commission or the fuel and energy department of the corresponding regional administration).

Wholesale gas prices are regulated with a view of achieving equal returns for gas supplies on the domestic market and gas exports. The final regulated wholesale gas price includes the following regulated components:

- Wholesale gas price
- Tariff for gas transmission via distribution networks

³⁴ Gazprom OJSC press release as of March 18, 2005.

- Rate for supplies and marketing services.

Gazprom income is generated from the sales of gas at the regulated wholesale price. The income of gas distributors, ensuring transmission of gas via distribution networks to consumers, is generated from the regulated transmission tariffs (GD tariff). Regional gas companies charge consumers for their supplies and marketing services. That said, wholesale gas prices for the population are 24% lower than wholesale gas prices for the other consumer categories. The GD and supplies and marketing services tariffs are differentiated for 8 consumer categories depending on the gas consumption volume.

From 2007, the Federal Tariff Service, to inform the gas market participants of the principles for setting wholesale gas prices (to apply from 2011), calculates indicative gas prices as per a set formula which is to ensure compliance with the principle of equal returns for domestic gas supplies and gas imports. Indicative prices, calculated for 2007–2008, were generally 2.2-2.9 times higher than the average regulated prices (source: annual report of Gazprom JSC for 2008).

The current status of the Russian gas market can be characterized by the following indicators (Table 2):

Table 2. Structure of the Russian Gas Market in 2008

Business processes	No. of companies or operators per business process	Quantitative indicators, bln m ³	Percentage of Gazprom JSC, %
Production	More than 20	665	83
Transmission (via the UGSS)	1	417	84
Storage	1	65*	99
Distribution	More than 300	351**	76
Wholesale	More than 35***	413	74
Exports	1	247	100
Imports	1	61	99

Source: Gazprom Databook 2009, Federal Tariff Service

* Active underground gas storage capacity

** Excluding company costs relating to gas transmission

*** Excluding regional gas companies affiliated to Mezhhregiongaz LLC

At present, there are 58 regional gas companies operating in the country, 55 of which are subsidiaries or affiliated bodies of Mezhhregiongaz LLC.

Domestic Market

The Russian Federation's domestic gas market is dominated by a monopoly, the Unified Gas Supply System (EGSS). Market participants include:

- Corporate owners of gas supply systems: Gazprom JSC, Kamchatgazprom JSC, Rosneft-Sahkalinmorneftegaz JSC, Norilskgazprom JSC, Sahkalinmorneftegaz JSC, and Yakutgazprom JSC.
- Independent gas producers.
- Other organizations that legally own gas and/or provide gas transmission and storage services, or persons authorized by such organizations.
- Corporate buyers who purchase gas for its subsequent resale.

Notionally, the domestic gas market can be broken down in two segments:

- Gas market within the area serviced by the UGSS ("the UGSS market").
- Isolated markets represented by local gas supply systems.

The UGSS gas market encompasses 55 of the 57 administrative regions in European Russia and 9 West Siberian regions. UGSS gas supplies are available in six economic regions: Central, North-Western, Volga, Southern, and parts of Urals and West Siberia. Local gas supply networks are monopolies, with the seller providing the entire range of services relating to production, treatment, transportation and sales of natural gas. This market segment accounts for 2% of the country's total annual natural gas consumption.

The gas market can be broken down into regulated and non-regulated market segments. Of these the bigger is the regulated market, and Gazprom is the major supplier in this sector. Gas produced by Gazprom in line with the Russian Federation Laws and Government Decrees is marketed to domestic consumers primarily at State-regulated prices. On the deregulated market Gazprom and independent producers have been selling gas at the Mezhrefiongaz Electronic Trading Platform (ETP). As part of the experiment Gazprom, as well as other independent producers are entitled to sell on the ETP up to 7.5 billion cubic metres of gas at market-based prices.

Independent gas producers and sellers can offer gas at a contract price that is typically 25-30% higher than the regulated wholesale price specified by the Russian Federation's Federal Energy Committee. Access of independent market participants is regulated by the corresponding Russian Government Directive³⁵. Independent gas suppliers can access the Gazprom JSC gas pipelines subject to available capacity and are treated on the same basis as Gazprom JSC subsidiaries. By law³⁶, gas consumers may choose their gas supplier provided that the supplier ensures transportation of the corresponding gas quantities via the gas transmission system. This condition laid the foundation for the emergence of independent suppliers and development of the non-regulated gas market segment.

Before 1997, end-user gas supply and collection of payments were performed by gas distributors (GD) and structural units within Gazprom JSC subsidiaries. In 1997, the gas sales functions performed by Gazprom JSC subsidiaries were taken over by the newly-established specialized Gazprom JSC subsidiary Mezhrefiongaz LLC. Mezhrefiongaz LLC established its regional branches in virtually every Russian region. These branches, called regional gas companies (RGCs), subsequently became independent legal entities incorporated as limited liability companies (LLC). The RGCs were designated authorized gas suppliers, which made possible the transfer of the end-user gas supplies and end-user settlement functions to the RGC. Gas sales thereby became an independent business process. Costs associated with the supply-marketing function were ring-fenced and deducted from the gas distributor tariff and wholesale gas price.

The basic rules related to the functioning of the Russian gas market are stipulated by the Federal Law on gas supply³⁷. The authority to regulate the activities of the Russian Federation's natural monopolies operating in the country's fuel/energy and transport sectors is vested with the Federal Energy Committee (FEC). One of the main objectives of this Committee was the State regulation of prices and tariffs for products / services of the natural monopolies operating in the fuel / energy and transport sectors.

The Committee regulated gas prices by determining the economically-justified (not-to-be-exceeded) price levels for natural gas produced by Gazprom JSC and its affiliated bodies Kamchatgazprom JSC, Rosneft-Sahkalinmorneftegaz JSC, Norilskgazprom JSC, Sahkalinmorneftegaz JSC, and Yakutgazprom JSC (Russian Government Directive № 863 as of July 17, 1996). Wholesale prices are set for specific zones in the area covered by the UGSS (for gas supplied by Gazprom JSC and its affiliated bodies) and are differentiated for domestic and all other consumers (see Table 3).

³⁵ Russian Government Directive #858 "On Ensuring Access of Independent Organizations to the Gas Transmission System Owned by Gazprom Joint Stock Company" as of July 14, 1997.

³⁶ Russian Government Directive № 1445 "On Approval of Regulations for Gas Supply to Russian Consumers" as of December 30, 1994.

³⁷ The Federal Law "On Gas Supply in the Russian Federation" № 69-FZ as of March 31, 1999.

Table 3: Wholesale Natural Gas Prices in 2000*, rubles/K m³

Zone	Consumers (Non-domestic)	Domestic
0	224	181
I	270	190
II	315	208
III	353	223
IV	371	228
V	388	233
VI	400	237

* End-of-year

Source: FEC Directive "On Wholesale Prices for Gas Intended for Subsequent Realization to Russian Consumers (Excluding Population)" #18/1 as of April 14, 2000, FEC Directive "On Wholesale Prices for Gas Intended for Subsequent Realization to the Russian Population" № 18/2 as of April 14, 2000 (as amended on December 27, 2000).

Differentiation of gas prices according to the cost of transportation from production sites to consumers was not introduced until February 1997. The dynamics of average wholesale gas prices produced by Gazprom JSC and its affiliated bodies are shown in Figure. 1.

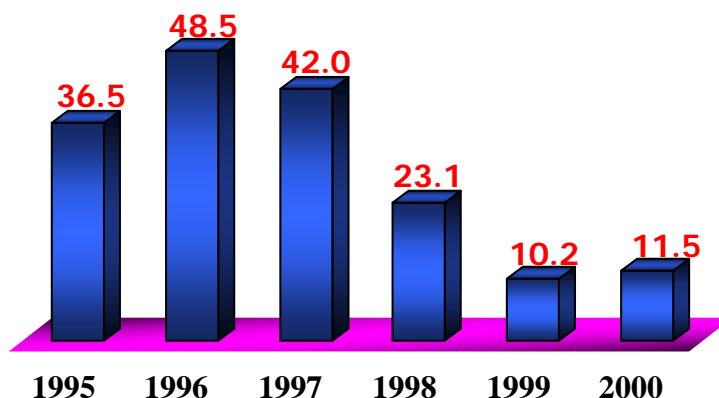


Figure. 1. Dynamics of Russian Gas Prices in 1995-2000, \$/K m³

Source: Gazprom JSC (briefing as of June 1, 2005)

Gas production projects

Major projects for hydrocarbons exploration in the Russian Federation are carried out in six federal districts —Urals, North-western, Southern, Volga, Siberian the Far East. Gas production level will be maintained by bringing on-stream capacities at existing and new fields and sites in the Nadym-Pur-Taz region. New strategic gas production areas are planned for the Yamal Peninsula, the continental shelf of the Barents Sea, the Ob and Taz bays, Eastern Siberia and the Far East. Deposits of the Sakhalin shelf were discovered and explored by Russian skilled professionals with Russian equipment in cooperation with foreign partners.

The Shtokman gas and condensate field development project is of strategic significance for Gazprom. The field will become a resource base for Russian pipeline gas as well as liquefied natural gas (LNG) exports to the Atlantic Basin markets.

The Shtokman development project envisages annually producing some 70 bcm of natural gas and 0.6 mln t of gas condensate comparable to annual gas output of Norway, one of the largest European gas suppliers. Phase one contemplates annually producing 23.7 bcm of natural gas with the start-up of gas supply via the gas pipeline due in 2013, and liquefied natural gas supply in 2014.

Gazprom, Total and StatoilHydro signed a Shareholder Agreement establishing Shtokman Development AG special purpose company. Gazprom owns 51 per cent, Total — 25 per cent and StatoilHydro — 24 per cent of the company's stock. The company will be the owner of the first phase infrastructure of the Shtokman gas condensate field for 25 years after its commissioning. The relations between the special purpose company and Sevmorneftegaz will be based on a contract stipulating that Shtokman Development AG will bear all the financial, geological and technical risks associated with the extraction of gas and condensate as well as LNG production. Gazprom retains 100 per cent of Sevmorneftegaz's stock and all rights to market an output.

The Yamal Peninsula is a strategic oil- and gas-bearing region of Russia. Commercial development of fields onshore and offshore Yamal is crucial for securing Russia's gas production build-up beyond 2010. Gazprom holds the development licences for the Bovanenkovskoye, Kharasaveyskoye, Novoportovskoye, Kruzenshternskoye, Severo-Tambeyskoye, Zapadno-Tambeyskoye, Tasiyskoye and Malyginskoye fields. In terms of gas reserves the Bovanenkovskoye field is the most significant one on the Yamal Peninsula (4.9 tcm). The initial gas reserves of the Kharasaveyskoye, Kruzenshternskoye and Yuzhno-Tambeyskoye fields amount to about 3.3 tcm. To secure the conveyance of gas from Yamal, a unique, new-generation gas transportation system, unparalleled in the Russian Federation, is planned to be created before 2030. The overall distance of Yamal gas transportation by the new pipelines will be in excess of 2,500 km.

Implementation of the rates and parameters for natural gas production build-up set forth in the Russia's Energy Strategy until 2030 is closely linked with the development of a new gas production region—the Yamal Peninsula

Gas infrastructure projects

The Unified Gas Supply System of Russia (UGSS) is the largest gas transmission system in the world. It represents a unique technological compound comprising gas extraction, processing, transmission, storage and distribution facilities. UGSS assures steady gas supply from the wellhead to the end user. Thanks to centralized management and considerable ramification and parallel transmission routes, UGSS has a substantial reliability margin and is able to uninterruptedly supply gas even under seasonal peak loads.

At the same time, Gazprom is implementing new gas pipelines construction projects to secure internal and external gas supply. New projects have been initiated (Nord Stream and South Stream) to reduce transit risks, increase reliability and flexibility of gas export supplies.

The Nord Stream gas pipeline is a fundamentally new route for Russian gas exports to Europe. The target markets for gas supply via Nord Stream are Germany, the United Kingdom, the Netherlands, France, Denmark and other countries. Nord Stream will link the Russian Federation's Baltic coast near Vyborg with Germany's Baltic coast in the vicinity of Greifswald. The pipeline length will average 1,200 km. Planned for commissioning in 2011, Nord Stream's first line will have a throughput capacity of 27.5 bcm per year. The second line construction by 2012 is projected to double Nord Stream's throughput capacity to 55 bcm. The new gas pipeline is very important in terms of meeting the increasing natural gas demand in the European gas market. Gas imports to the EU countries are expected to grow in the nearest decade by nearly 200 bcm, or more than 50 per cent. Owing to a direct connection between the world's largest gas reserves located in the Russian Federation and the European gas transmission system, Nord Stream will be able to satisfy about 25 per cent of the foregoing extra demand for imported gas.

The South Stream project is also aimed at strengthening of the European energy security. It is another real step toward executing the Gazprom strategy to diversify the Russian natural gas supply routes. The new gas pipeline system meeting the latest environmental and technological requirements will significantly raise the energy supply security of the entire European continent. The project provides for South Stream's offshore section to run under the Black Sea from the Russian coast (Beregovaya compressor station) to the Bulgarian coast. The total length of the offshore section will be around 900 km, maximum depth over 2 km and full capacity 63 bcm.

Finally, underground gas storage (UGS) facilities are an integral part of the UGSS and are situated in the main gas consumption regions. UGS facilities help to smooth out seasonal fluctuations of gas demand, reduce peak loads in UGSS and provide for better flexibility and reliability of supply. The network of facilities supplies Russian consumers with up to 20 per cent of gas during the heating season and up to 30 per cent of gas during cold snaps. At present, Gazprom is constructing three UGS facilities in the Russian Federation: the Udmurtia reserving complex in an aquifer, the Kaliningrad and Volgograd UGS facilities in salt caverns. Several UGS facilities are in the process of engineering, development, feasibility study and exploration. A wide scope of work is scheduled for Eastern Siberia and the Far East in 2010–2011 aimed at searching for the suitable formations to build UGS facilities and underground storages of helium concentrate.

As part of the strategy aimed at securing natural gas supplies to Russian consumers, Gazprom is taking part in UGS projects in the countries, through which the bulk of Russian exported gas is transported. In addition, Gazprom, in cooperation with its European partners, is studying the possibilities of implementing new UGS construction and operation projects in European States.

Export Markets

Gas exports are carried out via the single exports channel. In the Russian Federation, exclusive gas export rights are enjoyed by the owner of the Unified Gas Supply System or its subsidiary (Gazprom JSC or Gazprom Export LLC). The electronic trading platform (ETP) at Mezhhregiongaz LLC is becoming an increasingly important segment of the domestic market. The ETP began operating in November 2002. In 2006, the Government authorized Gazprom JSC to sell up to 5 bcm of gas at non-regulated prices via the ETP. The dynamics of the key ETP performance indicators are shown in Table 4.

Table 4. Key ETP performance indicators for 2002-2008

	2002	2003	2004	2005	2006	2007	2008
Sales volume via the ETP, billion m ³	1	1.4	0.6	0.05	0.6	7.1	6.1
Excess ETP price as compared to regulated price, %		10	28	21	32	37	38

Source: Gazprom JSC (report delivered on November 16, 2006, annual report of Gazprom JSC for 2006-2008)

The continuing rise of gas prices on the domestic market and the strategic commitment of the Russian Federation Government to bring them to a level ensuring equal returns for the producer in terms of domestic gas supplies and gas exports have created objective conditions for active development of independent gas producers. Staged liberalization of gas prices, transition from price regulation to regulation of transmission tariffs, and introduction of new trading technology promote the expansion of the non-regulated gas market segment.

Gazprom strives to maintain the dominant position of Russian gas in the regional energy sector of the former Soviet States. The company has expanded cooperation with the Central Asian countries in the sphere of gas reserves development, upgrading and construction of gas pipelines to create opportunities to reach new markets and maintain reliable supplies of traditional consumer.

Gazprom continues to implement joint projects abroad, including projects in Vie Nam (geological exploration work on Block № 112), India (geological exploration work on Block № 26 in the northern part of the Bay of Bengal), Venezuela (Bolivarian Republic of) (geological exploration work within the Rafael Urdaneta project), and Libya (geological exploration work in licensed areas № 19 and 64).

Commonwealth of Independent States

Armenia does not produce natural gas. Gas is supplied by Gazprom, with imports delivered through Georgia (whose infrastructure is in poor condition). The Government is trying to improve its energy security by diversifying gas supply routes. Its main projects include:

- Construction of a gas pipeline from Iran to Armenia.
- Reconstruction, modernization and development of the country's gas transmission system and gas facilities.
- Modernization of the Abovyan underground gas storage facility.

New projects for developing the gas transmission system involve foreign capital in the form of loans and joint ventures, attracting foreign civil contractors and suppliers of pipes and gas equipment.

The gas market is dominated by a natural monopoly. ArmRosgasprom LLC (75.5% owned by Gazprom, 20% by the Government, and 4.5% by Itera) is the owner of the gas transmission system, gas storage and distribution facilities. The company operates 1362 km of gas mains and another 11330 km of distribution gas lines. ArmRosgasprom LLC enjoys the monopoly power to supply and distribute Russian natural gas on Armenia's domestic market.

Azerbaijan. Azerbaijan benefits from its own resource base. Hydrocarbons are locally produced by the State oil company (GNCAR), local operators, joint ventures and two international consortiums (with mandatory GNCAR participation in all projects). The Shakh-Deniz gas field is exploited by a consortium of BP (operator with a 25.5% stake), Statoil (25.5%), LUKOIL (10%), NICO (10%), Total (10%) and TPAO (9%) with a 10% stake owned by GNCAR. Until 2006, natural gas was imported from Russia. When the Shakh-Deniz gas field came into operation in 2007, Azerbaijan became a natural gas exporter and began supplying gas to Turkey and Georgia. Azerbaijan can import natural gas from the Islamic Republic of Iran and is involved in swap supplies of gas from that country.

A peculiarity of the Azerbaijan market is the combination of a State monopoly in gas transportation and the regulated access of private companies, including companies with foreign capital, in the gas production. Leading energy companies like Chevron-Texaco Azerbaijan Ltd, ExxonMobil, JAOC-Japan Azerbaijan Co Ltd, TotalFinaElf Exploration & Production Azerbaijan, Shell Azerbaijan Exploration & Production BV and other companies operate in Azerbaijan within the framework of the international consortia (with GNCAR as a partner). Though gas production has been liberalized, prices have not changed to reflect the costs of supply.

Azerigas LLC, a subsidiary of the country's State oil company GNCAR, owns the national gas transportation system. It also purchases gas from GNCAR for further resale to Azerbaijani consumers and is the monopoly gas supplier. Local sources believe that Azerbaijan's commercial market infrastructure is poorly developed: Azerigas LLC does not have a nationwide system for controlling gas consumption via gas meters. Data on gas consumption are derived from information on gas volumes pumped into the gas transportation system. The lack of gas meters is viewed as a constraining factor for further development of the national gas market.

Belarus. Limited production of natural gas in Belarus is a by-product of the production of oil. Gas is imported from the Russian Federation and 30% of Russian gas exports transit Belarus. Gas prices, tariffs, and domestic gas supply are regulated by the Government. The gas sector comprises:

- A 7.8k km gas main system (2.8 K km of large-diameter pipelines).
- 2 underground gas storage facilities.
- 228 gas distribution stations with a combined capacity of 51 bcm of gas.

Key organizations include Beltransgaz and Beloptgaz, the Belarus fuel and gasification concern (an amalgamation of gas suppliers). Recent Government decisions permitting the construction of the Yamal-Western Europe transcontinental gas pipeline on the Belarus territory and authorizing the privatization of Beltransgaz may be the first steps towards gas market liberalization. The Government has permitted a foreign investor (represented by Gazprom) to purchase a stake in the gas transportation company and ensured a centralized handling of gas traffic flows.

The Belarus Government is considering various options for handing its major industrial facilities over to foreign investors in exchange for a stable energy supplies guarantee. No information is available on the liberalization of gas prices on the domestic.

Georgia. Georgia has no domestic fuel resources and is highly dependent on gas imports. Its gas transportation system is 1,900 km long with a capacity of 20 bcm. Until 2008, the Russian Federation (Gazprom JSC, Itera) was Georgia's dominant gas supplier. A transit gas pipeline crossing Georgian territory delivers Russian gas to Armenia, for which Georgia receives 10% of the total gas volume, accounting for 12% of national demand.

The country's oil and gas corporation is a joint-stock company fully controlled by the State. Under the law and in agreement with international investors, the company represents Georgia in all pipeline projects transporting Caspian oil and gas via Georgia to the international market. It is responsible for the production, storage and sales of oil and gas on the Georgian territory. The Government's strategy on diversification of gas supplies was implemented in 2007 when Georgia received first its natural gas imports from the Shakh-Deniz gas field in Azerbaijan. The onset of gas supply from Azerbaijan placed GNCAR in a controlling position for most of Georgia's gas market. Since 2008, Azerbaijan has been Georgia's main supplier of natural gas.

Kazakhstan. Kazakhstan's vast gas reserves allow it to satisfy domestic demand and export large quantities of gas. Natural gas is transported across Kazakhstan via a 10,000 km system of gas mains passing through eight regions. The network was built as part of the Soviet system, originally intended for delivery of gas to northern Russia, Ukraine and the Caucasus. The gas system does not interconnect the entire country—supplies of cheap gas produced in western Kazakhstan are unavailable to the country's northern and southern regions. This issue is especially acute for consumers in southern Kazakhstan and the city of Alma-Ata, for which Kazakhstan depends on gas supplies from the Russian Federation (the Kustanai region) and Uzbekistan. The leading companies include:

- The national holding company KazMunaiGaz Oil Company (KMG)
- KazTransGaz JSC (KTG) – a KMG subsidiary
- Intergaz Central Asia – a KTG subsidiary
- Alma-Ata Power Consolidated and Alma-AtaGaz – a KTG subsidiary
- The national oil and gas company Kazakhoil.

Liberalization is aimed at the maximum development of market relations and of a competitive environment. The State policy for developing the country's fuel and energy complex is to enhance the efficiency and profitability of the producing sector, to diversify and create new areas to ensure further economic growth, and to implement "breakthrough" projects of a global character expected

to promote Kazakhstan's becoming one of the world's 50 most-competitive countries. The main challenges for the gas sector are the use of capacity for gas transit from fields in Turkmenistan and Uzbekistan, identifying sales channels, and organizing sales of Kazakhstan gas in Russia and Europe.

The Government has introduced a favorable regime for attracting foreign investments, and formulated regulations on natural gas supply, transportation and sales. The gas industry remains under State control, and further development of the gas market will be focused on ensuring:

- Diversification of gas transport routes
- Competition and equal access to the nation's gas transportation system
- Favourable investment climate.

Kyrgyzstan. Gas production in Kyrgyzstan is about 30 million m³ per year. Gas imports mainly come from Uzbekistan. In addition, Kyrgyzstan pays Kazakhstan for storage and transit of Uzbek gas delivered to consumers in northern Kyrgyzstan. Vertically-integrated, State-owned Kirgizneftegaz and Kirgizgaz are responsible for production, transportation and distribution of gas. The State owns 86.15% of Kirgizneftegaz's equity capital.

The total length of the pipelines on the territory of Kyrgyzstan (together with the gas distribution networks) is approximately 600 km. Gas prices in the domestic market depend on the price of gas purchased in Uzbekistan. High dependence on gas supplies from Uzbekistan and the instability of gas supply have stimulated the Government to attract investors to exploit the nation's proven gas reserves (some 6 bcm) and to develop the gas transportation infrastructure. In particular, the Government is considering Gazprom's participation in privatizing gas infrastructure facilities in Kyrgyzstan. In 2008, the Government reorganized the State-owned enterprises into joint-stock companies and listed the newly established companies' shares on the stock market.

Republic of Moldova. Proven gas reserves in the Republic of Moldova are approximately 22 bcm. Local gas production is insignificant and the country relies on gas supply from the Russian Federation. The Republic of Moldova has a 862-km gas transportation system, comprising 73 gas distribution stations. The system's capacity is 44.5 bcm. Russian gas exports to Romania transit the country, and transit is ensured by two Moldova-Gas Co. subsidiaries – Moldovatransgas and Tiraspoltransgas. Moldova-Gas Co., a Russian-Moldavian JV, was established in 1999. The Republic of Moldova owns 35% of the equity capital, the Russian Federation owns 50% plus one share, another 14% is owned by the Transnistria-based Tiraspoltransgas (comprising six local gas facilities) and 1% is held by private investors.

In 2009, the parliament passed a new law on natural gas so as to promote competition on the market by functional separation of transportation and distribution, supplies and production of natural gas. This law is aimed at ensuring non-discriminatory and regulated access of all individuals and legal entities to the natural gas networks, including the use of transparent and predictable tariffs, the protection of gas consumer rights and promotion of their interests, ensuring the functioning of an independent regulatory body for the natural gas sector. The law is expected to promote the further development of the country's natural gas sector, the expansion of its gas pipelines, and create a competitive domestic market.

Having ratified the Energy Charter Treaty, the Republic of Moldova used its framework to harmonize its national legislation with international requirements and, as a consequence, has ensured the same rules for all signatories of international acts. All articles relating to transit, investments, trade, cross-border cooperation, etc. are based on the corresponding international legal acts.

Turkmenistan. Turkmenistan's gas transportation system comprises pipelines with a total length of 8,000 km. Turkmen gas is exported to the north (to the Russian Federation and Ukraine) and to the south (to the Islamic Republic of Iran). Gas is produced by the State-owned concerns Turkmengas, Turkmenoil and Turkmengeology.

Turkmen gas accounts for more than 80% of the total gas output. Most of the services provided by the oil and gas sector come from specialized divisions of these State-owned concerns. All production of natural gas is done by the State-owned concern. Operations of foreign companies are limited to supplying the necessary equipment, such as auxiliary compressors, compressor stations and gas treatment units, and to the transportation infrastructure. The gas industry remains under strict Government control. All its business processes are distributed among the specialized companies. Accordingly, all reforms of the gas industry relate to internal restructuring. The Government is committed to attracting foreign investment and gas-sector development.

In October 2006, the members of Turkmenistan's Peoples Council adopted the national oil and gas sector development programme until 2030. By then, Turkmenistan plans to be producing 250 bcm of gas and 110 million tons of oil per year. The volume of oil refining is to increase to 30 million tons and petroleum product exports to 20 million tons.

In March 2008 the priorities for developing the country's hydrocarbon sector were defined. The overall strategy for developing the energy resources and integrating them into the global energy systems is defined in the "Programme for Development of Oil and Gas Industry of Turkmenistan up to 2030." In 2009 the President affirmed the principles of hydrocarbon export policy— Turkmenistan intends to prohibit the re-export of its natural gas. It actively supports three new gas-export pipelines. The Turkmenistan-China pipeline (30 bcm), the Caspian Coastal pipeline (30 bcm), and the Trans-Afghan pipeline (33 bcm) are at the centre of the Turkmenistan hydrocarbon export diversification plan. The long-dormant Trans-Caspian is not one of them but it has not been removed from the list of future possibilities. Audit of some hydrocarbon deposits and gasification of rural areas are also among the priority items.

According to BP *World Energy Statistics* (2007), Turkmenistan's gas reserves are around 2.9 tcm. According to Gaffney Cline & Associates, under the international estimation and classification system, the low estimate of the South Yolotan/ Osman deposit is 4 tcm of gas, the optimal estimate is 6 tcm and the high estimate is 14 tcm. It is therefore the fourth or fifth largest gas field in the world.

In 2008, gas production in Turkmenistan reached about 70 bcm: 20 bcm of which went to feed the internal demand. The volume of 6 bcm exported to the Islamic Republic of Iran and 44 bcm was sold to Gazprom to supply its markets in the Russian and Ukraine.

In April 2006 during a visit of the former president of Turkmenistan, Mr. S. Nijazov to China, an agreement was reached between the Ministry of oil and gas industry and mineral resources of Turkmenistan and the Chinese national oil and gas corporation (CNPC) on cooperation in developing oil and gas onshore and offshore deposits and constructing the "Turkmenistan – China" gas pipeline, with a total capacity of 30 bcm. The pipeline is to be fed by the Bagtiyarlyk cluster (1.3 tcm) at the right bank of Amu Darya River. In 2009 CNPC was involved in developing the "Bagtiyarlyk" gas field, implemented the construction of gas-processing factories and carried out geological prospecting of "South Yolotan/Osman" gas field deposits. It launched a first stage (5 bcm.) of high-volume (100 atm.) export gas pipeline in December 2009. China plans to invest in Turkmenistan gas industry about US\$ 10 billion.

In April, 2009 Germany's RWE AG (a shareholder of Nabucco) signed an agreement with Turkmenistan allowing the company to develop an offshore gas block and seek new ways to deliver Turkmen gas to Europe. Under the agreement, RWE and Turkmenistan will examine and consult with each other on possibilities for initiating deliverers of Turkmen gas to Europe. The sides will establish a long-term partnership to transport Turkmen gas to the country's border and export it to international markets. Turkmenistan has assigned its offshore Block 23 to RWE as an initial step, with further blocks possibly to be added. Exploration work was to start in 2009. RWE would also provide technical training for Turkmen specialists.

In July 2009 Turkmenistan reached an agreement to boost natural gas sales to the Islamic Republic of Iran by 8 bcm per year to 14 bcm. The countries agreed that 8 bcm of gas would be supplied each year to Iran from the Korpedje deposit in western Turkmenistan, and 6 bcm would

come from Dauletabad in the southeast, the country's largest gas field. To supply gas, a new pipeline was built up to the Iranian border, which was to begin operations in 2009. An agreement was reached on a market price for natural gas, calculated under an international formula. The price of gas should be decided quarterly, taking into account the current prices of crude, gasoline, diesel oil, and some other petroleum products. It had been predicted that in 2010 the Islamic Republic of Iran would be paying around US\$ 200 per 1,000 cm for Turkmen gas. If US\$ 200 per 1,000 cm was the approximate price of Turkmen exports to China and the Islamic Republic of Iran in 2010, it would bring in US\$ 3.8 billion of revenue, enough to cover all the expenses and sustain the national development plan.

The pipeline to China, designed for higher volumes, will initially carry 5 bcm of gas. The one to the Islamic Republic of Iran was to start with 6 bcm of annual throughput. In addition, Turkmenistan was to continue to pump 8 bcm through the existing Korpjeje-Kurtkui pipeline to the northwestern provinces of the Islamic Republic of Iran. This comes to 19 bcm of Turkmenistan gas exports to the Islamic Republic of Iran and China in 2010.

During a December 2009 meeting, the President of Turkmenistan, Mr. G. Berdimuhamedov, and the President of the Russian Federation, Mr. D. Medvedev, signed amendments to the gas sale and purchase agreement. According to available information, the Turkmen gas supplies to the Russian Federation, which were suspended in April 2009, were to resume at the beginning of 2010, with an annual volume of 30 bcm. The price of the gas would be based on a formula that conformed to conditions in European gas markets and was linked to the price of crude oil and/or petroleum products.

Turkmenistan and the Russian Federation have agreed to go ahead with the Caspian Coastal Pipeline that is supposed to run along the Caspian coast, clustering additional Central Asian gas from Turkmenistan and Kazakhstan for shipment to Russia. It was agreed earlier to upgrade a small line, linking Turkmenistan, Kazakhstan and Russia with an annual capacity of less than 0.5 bcm to carry 30 bcm by 2015, bringing total export capacity to Russia to more than 100 bcm.

Turkmenistan and the Russian Federation were to jointly build the East-West pipeline that will connect all the main gas fields of Turkmenistan to a single network, making it possible for importers to draw gas from any field, with the additional benefit of gasifying some remote settlements. Turkmenistan and the Russian Federation will also cooperate in developments of some fields in the Caspian sector of Turkmenistan.

Ukraine. In Ukraine, gas is produced by three companies, all operating under the umbrella of Naftogaz Ukraini: Ukgazdobycha produces around 75% of the total volume, Ukrnafta - around 17% and Chernomornaftogaz - 4%. Transportation of natural gas via gas mains is carried out by Ukrtransgaz, a Naftogaz Ukraini subsidiary. The majority of gas distribution stations are owned and controlled by the Government.

Ukraine's output of gas is insufficient to satisfy domestic demand for gas. Gas imports are extensive, with Russia being the main supplier. Supplies also come from Central Asia. Today's Ukrainian gas market is not monopolistic. The number of independent gas producers does not exceed seven or eight. Often these companies, having no direct access to the consumer, sell their gas to Naftogaz Ukraini at a price established by the monopoly. Independent traders sell small volumes of gas. However, Naftogaz Ukraini enjoys a transportation and import monopoly.

In the longer term, it is envisaged that transportation and distribution functions will be separated and the rights and duties of the companies involved in these operations regulated. For example, suppliers will be obliged to post the information on natural gas prices and tariffs for gas distribution, transmission and supplies on their official websites and in the regional media outlets. Customers, acting under the corresponding contracts, are to order gas transportation and distribution services for the consumers, transit of gas across Ukraine or storage in underground facilities. The natural gas market will be based on the free selection of suppliers, trading in gas, including gas

auctions and exchanges, and commercial tenders. At the same time, the draft law incorporates the basics of State control and regulation.

Uzbekistan has its own gas reserves. Its extensive gas transmission system includes nine gas mains with a total length of 12,000 km and a link to the unified gas network of the CIS countries. Uzbekistan's gas transmission system is at the heart of Central Asia and is important for both Central Asia and the European part of the CIS and Transcaucasia.

Its oil and gas industry satisfies 93% of the country's energy sector in primary fuel resources. Oil and gas enterprises are united in the national holding company, Uzbekneftegaz, established in 1992. In 2006, the President of Uzbekistan decided on a structural reorganization of Uzbekneftegaz holding company (Presidential Decree № PP-466 of 21 August 2006). The reforms boil down to internal structural changes resulting in the establishment of eight joint-stock companies, each being an Uzbekneftegaz subsidiary, which dispose of the assets of the enterprises directly involved in the gas industry's business processes. The Government has pursued a policy of attracting foreign investments within the framework of projects for exploiting new oil and gas fields and of diversifying external sales markets for natural gas.

The Balkan States

In 2006, the Treaty establishing the Energy Community was signed between the European Commission, Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Montenegro, Romania, Serbia, the former Yugoslav Republic of Macedonia, the United Nations Interim Administration Mission in Kosovo (pursuant to the Security Council resolution 1244). The main aim was to create a legal and economic framework in relation to network energy (electricity and gas). After their accession to the European Union, Bulgaria and Romania left the Energy Community. The objectives of the Treaty were to:

- Create a stable regulatory and market framework capable of attracting investment in gas networks, power generation, and transmission and distribution networks, so that all Parties have access to the stable and continuous energy supply that is essential for economic development and social stability.
- Create a single regulatory space for trade in Network Energy that is necessary to match the geographic extent of the concerned product markets.
- Enhance the security of supply of the single regulatory space by providing a stable investment climate in which connections to Caspian, North African and Middle East gas reserves can be developed, and indigenous sources of energy such as natural gas, coal and hydropower can be exploited.
- Improve the environmental situation in relation to Network Energy and related energy efficiency, foster the use of renewable energy, and set out the conditions for energy trade in the single regulatory space.
- Develop Network Energy market competition on a broader geographic scale and exploit economies of scale.

Each contracting party is obliged to implement the EU body of law on energy. In relation to natural gas, this includes:

- Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas.
- Regulation (EC) No 1775/2005 of the European Parliament and of the Council of 28 September 2005 on conditions for access to the natural gas transmission networks.
- Council Directive 2004/67/EC of 26 April 2004 concerning measures to safeguard security of natural gas supply.

Gas markets in Energy Community members are at different stage of development. Three groups of members may be identified:

- Croatia and Serbia have more mature markets,
- Bosnia and Herzegovina and the former Yugoslav Republic of Macedonia have limited markets,
- Albania and Montenegro do not have gas markets.

Bulgaria

Market structure

The Bulgarian natural gas market, although it has greatly advanced in recent years, cannot yet be regarded as fully developed. The demand for natural gas is relatively low - only about 3.4 bcm for 2008. Of these 0.211 bcm were covered by indigenous production, while the rest was imported from the single supplier of natural gas to Bulgaria, the Russian Federation.

The use of natural gas accounts for about 16% of the country's primary energy consumption. In general, natural gas usage is on the rise, as gas is being employed more and more in the residential sector, as well as in the industry. Nevertheless, less than 2% of are gasified, which is far below the average rates for the European Union—between 27% and 50%. Only about 16% of the municipalities in the country have access to natural gas, compared with 27% to 80% for the rest of the EU.

The State-owned company “Bulgargaz” EAD is the only wholesale trader and public supplier of natural gas in Bulgaria. It imports the natural gas from three external suppliers (“Overgas Inc.” JSC, OOO “Gazpromexport” and WIEE) on the basis of a long-term agreement with the Russian energy company OAO “Gazprom”.

Transmission and transit of natural gas are carried out by the State-owned TSO “Bulgartransgaz” EAD, which also owns and operates the only natural gas underground storage facility in Chiren.

Distribution is carried out by 32 gas transmission companies servicing five gas distribution regions (Dounav, West, Trakia, Mizia, Dobrudja) and 58 municipalities outside these regions. The companies account for 12.9% of the country's natural gas consumption.

The natural gas market is regulated by the State Energy and Water Regulatory Commission (SEWRC). The Commission, which has around 50 employees, manages the licensing process and sets the price of natural gas for end suppliers (distribution companies) and for “protected” consumers (residential consumers and commercial consumers with an annual turnover of up to EUR 10 million).

Liberalization

Having joined the European Union as of 1 January 2007, Bulgaria is obliged to apply European Law as part of its domestic law. It is thus obliged, under Directive №55 of 2003, to fully liberalize its natural gas market. The purpose of the Directive is to open the natural gas market for free competition as far as supplies are concerned. Thus, as of 1 July 2007, all EU State States are required to eliminate barriers to natural gas trade, the privileges for a limited number of consumers, as well as to enable all consumers to freely choose their own natural gas seller.

Under this liberalization scheme each trader or owner of natural gas can be granted:

- Access to the transmission network of Bulgartransgaz EAD subject to execution of a contract

with it, respectively.

- Access to the distribution networks of the local/regional operators subject to signing of a contract for distribution with them, with the purpose of transmitting its quantities to the point of sale – the premises of a specific natural gas consumer. Under this scheme the trader calculates the price for transmission of its own gas to the consumer's premises in the end sale price of the "natural gas" commodity. The natural gas trader sells its quantities at freely negotiated (not State-regulated) prices.

This implies that each non-licensed natural gas trader is fully interchangeable with the State-owned Bulgargaz EAD and can freely make use of all gas pipelines in the country for the purposes of its business involving natural gas sale to end users. The reverse scheme is also possible where the consumer is to ensure contractually the route for its own gas supplies to the specific point of consumption. This is a legal option which, however, is inefficient and hardly feasible. Each trader has greater possibilities of booking capacities of the gas pipelines along the gas route by also negotiating more favourable prices for the transmission of its own quantities to the points of sale which match with the consumers' points of consumption.

Yet, while de jure liberalization of the natural gas market has occurred, de facto the market in the country is hardly liberalized, mainly because of the regulation of market prices. Currently, Bulgargaz EAD holds a licence for public supply, under which it is required to sell its own gas at State-regulated (SEWRC) prices only to end suppliers. These suppliers are under the obligation to sell the gas at the same regulated prices only to "protected" consumers (residential and small commercial customers) who have the right to purchase gas at a price regulated by a top limit (ceiling). All the other consumers should in theory buy natural gas at market-based prices.

This, however, is not the case, as Bulgargaz EAD applies the SEWRC regulated price not only to the end suppliers, but to all its consumers (directly connected to the transmission network), which are large industrial customers and do not belong to the protected group. Moreover, the company applies the regulated price also to the entire quantity of gas that the gas distribution companies purchase not only for the protected group of customers but for many other commercial consumers connected to the distribution networks. In practice, therefore, Bulgargaz EAD is currently the owner of the entire quantity of natural gas produced and imported in the country, without applying commercial "free" prices to any entity whatsoever.

Another related problem is that for Bulgargaz EAD, SEWRC repeatedly approves a price lower than the weighted average price, which means that the company is obliged to sell below production cost for long periods (over a year). This would not be a big issue if the company applied this non-market price to the protected group of customers only. But since Bulgargaz EAD applies the non-market price to all consumers it makes it economically impossible for other gas traders, offering quantities at competitive prices, to penetrate the market.

Security of Supply

To satisfy its natural gas needs, Bulgaria relies on gas supplies from the Russian Federation through the only pipeline connected to the country and which passes through Ukraine and Romania. Bulgaria also has one underground gas storage facility located in the Chiren region, which has an operative capacity of 0.65 bcm and the potential for a maximum extraction of 4.8 million m³ of natural gas per day. This represents less than 40% of the Bulgarian gas demand during the coldest winter months. The complete dependence on one source and one route of gas supplies makes the country vulnerable to sudden disruptions of gas deliveries as happened in January 2009. Indeed, Bulgaria was among the worst affected European States during the last winter's gas crisis, which prompted the Government to look for alternative ways to achieve security of energy supplies.

The short-term emergency efforts included the signing of agreements with Greece and Turkey to reverse gas flows in the case disruption of supplies. On the long-run the national policy of Bulgaria seeks to diversify both the routes and the sources of natural gas supply. Bulgaria is a party

to the South Stream pipeline project and participates in the Nabucco pipeline project. It also has plans to construct an intersystem link with the Greek gas system along the Komotini-Dimitrovgrad line, which will connect Bulgaria to the TGI (Turkey-Greece-Italy) pipeline that is to supply natural gas from the Islamic Republic of Iran and/or from Azerbaijan.

Market structure

Romania is among the few countries in the region with a significant indigenous production of natural gas. The country's annual gas consumption for 2008 amounted to 15.7 bcm, of which only 30% are satisfied by imports from the Russian Federation through two entry points, Isaccea 2 and Mediesul Auriu. Three trading companies are in charge of natural gas imports. The most important are WIEE and Wirom Gas, which are controlled by Wintershall, a joint venture between BASF and Gazprom. Seven companies undertake local gas production of which the "Romgaz" and "Petrom" have the greatest share, together satisfying about 70% of the country's gas consumption.

The transportation of natural gas on the territory of Romania is done by "Transgaz" – a 100% State-owned company that operates the national gas transmission system. Due to the growing importance of transmission and international transit activities, Transgaz enjoys a monopolistic position in Romania and will not be privatized in the medium to long term.

The distribution market in Romania is dominated by Distrigaz Sud (owned by Gaz de France) and Distrigaz Nord (owned by E.ON-Ruhrgas), which are distributors and suppliers of natural gas in the southern and northern parts of the country respectively. These two companies supply gas to 92 per cent of connected communities, although there are also about 40 additional licensed suppliers.

ANRGN is the regulatory authority for natural gas market. It is responsible for setting natural gas prices for "protected" consumers and tariffs for the regulated downstream activities (underground storage, transmission and distribution).

Liberalization

The status of liberalization in Romania is similar to that of Bulgaria. As a State of the European Union, the country has adopted the related EU directives and regulations concerning natural gas within its national legislation. As a result, Romania has regulated third-party access to its transmission system, has unbundled the activities of trade transportation and distribution of natural gas, has introduced the status of "eligible" consumers, and as of 1 July 2007 has fully opened the natural gas for all consumers, who can choose a natural gas supplier from those licensed by the regulatory authority and negotiate directly the clauses and the prices for gas supply.

Despite the existing legal basis, however, there is no real competition in the Romanian gas market. Like Bulgaria, the main reason for the lack of de-facto liberalization of the country's natural gas sector is the persistence of gas prices that are below the market average. In fact, in Romania the natural gas prices are even lower than those in Bulgaria, owing to the large share of domestic production, which allows for the provision of cheaper supplies. This remains an obstacle for the entrance of new companies on the national gas market.

Security of supplies

Romania possesses significant natural gas reserves and seeks to diversify its natural gas supplies. In that context, it aims to connect its national transmission system to the systems in the neighbouring countries. The national strategy in this regard has four directions:

- (a) Strategic interconnection of SNT to the neighbouring countries transport:
 - Interconnection to Hungary – Szeged- Arad pipeline.
 - Interconnection to Bulgaria – Russe- Giurgiu pipeline.
 - Interconnection to Serbia.
- (b) Interconnections in order to diversify the gas import sources:
 - Interconnection to Bulgaria at Negru Voda.

- Interconnection to Ukraine at Siret- Bucecea.
 - (c) Interconnections designed to develop new storage capacities :
- Interconnection to Moldova – Margineni store.
 - (d) Interconnection to Nabucco pipeline (natural gas transport corridor from the Caspian Sea to western Europe).

Bosnia and Herzegovina ³⁸

Bosnia and Herzegovina imports 100 per cent of its gas requirements. All natural gas is imported from the Russian Federation through the transport systems of Ukraine, Hungary and Serbia. Annual consumption varies between 0.3 and 0.4 bcm. The legislative framework is partially developed and does not provide for full implementation of the Energy Community Treaty obligations. Adoption of a proper legal framework is expected soon. Although present gas legislation requires the establishment of independent regulatory authorities, the timeframe for this activity is fragmented. The regulatory agency has started operations but covers just part of gas market. It performs activities related to tariff issues, licensing, monitoring and other activities required by the law.

Gas legislation has unbundling requirements but this is not fully implemented yet. The sole gas importer and wholesale trader is also the transmission system operator and operates most of the transmission pipeline. Accounting unbundling has been implemented for the distribution companies. There are four DSOs in Bosnia and Herzegovina and none has reached the 100,000 consumer threshold. Gas infrastructure includes just one transmission pipeline and four distribution networks. There is no underground storage nor LNG import facility. Legislation requires implementation of third-party access rules, but without clear legislation or gas market reform these are not in place.

The issue of market opening is not treated consistently in the legislation, and the timeframe for market opening is not harmonized between laws. Given the lack of harmonisation of legal and institutional frameworks, no consumers have achieved eligible status. Clear and transparent prices and methodologies are not developed, and the transmission network tariff is not visible within the supply price. Distribution system operators determine end user prices for different categories of consumers. These prices are adopted by local Governments.

Market structure

The natural gas market is largely undeveloped. The country consumes only about 0.3 bcm of gas per year (310 million m³ for 2008), mostly used for household heating, as well as to fuel the two larger industrial customers - the aluminium factory "Birac" in Zvornik and the steel factory "Mittal Steel" in Zenica. There is no domestic production of natural gas and the entire volume of this energy source is imported from the Russian Federation across the gas transmission systems of Ukraine, Hungary and Serbia.

The State-owned "BH-Gas" is the single supplier of natural gas and the biggest gas carrier within the country. Two other companies also transport natural gas: "Gaspromet Pale" operates and maintains a 22 km stretch of the gas transmission pipeline between the Serbia-BH border and the regulating station at Zvornik. Sarajevogas Lukavica operates and maintains a 40 km stretch of gas transmission pipeline between the regulating station at Zvornik and the regulating station at Kladanj. Four gas distributors are responsible for the distribution and retail sale of gas, namely Sarajevogas Sarajevo (serving 93.8% of distribution customers), Zvornik Stan (2.2%), Sarajevo-gas Lukavica (1.4%) and Visokogas Visoko (2.6%).

³⁸ SEE Regional Gasification Study: Bosnia and Herzegovina Market, October 2007, Economic Consulting Associates, Penspen, EIHP

Unlike the electricity sector, the natural gas market is not regulated by a special body and this function is performed by the respective State authorities. For example, the wholesale price of natural gas is determined by the Ministry of Trade, while the retail price is determined by the city or municipality Governments.

Liberalization

The natural gas market is not yet liberalized: there are no transparent third-party access (TPA) rules, there is no separation of the activities of the trader and the TSO, the customers are not entitled to choose their suppliers and there is no independent regulator for the gas sector. Bosnia and Herzegovina's priorities are therefore as follows:

- To adopt natural gas legislation, in line with the EU *acquis communautaire* and the obligations from the Treaty establishing the Energy Community.
- To create a regulatory authority for the natural gas sector (there is a proposal to widen the responsibilities of the State Electricity Regulatory Commission to include gas).
- To implement a privatization programme with a focus on privatizing “BH-Gas” in order to create an environment that would attract potential foreign and domestic partners to invest into the natural gas sector.

Security of Supply

While the country consumes only limited quantities of natural gas, it faces security of supply concerns, which are mainly related to the state of the internal gas distribution system. This system is underdeveloped and requires extensive rehabilitation. However, the lack of real competition hinders the solution of the problem related to the poor throughput capacity of the main transportation network in the country, which represents an obstacle towards attaining both energy security and the liberalization of the natural gas market.

When it comes to securing emergency supplies of natural gas, there is currently a project to construct an underground storage facility in the region of the town of Tuzla with a capacity of 100 mcm.

Croatia^{39 40 41}

The gas market in Croatia is considered the most mature among Energy Community members, and the level of implementation of the Energy Community Treaty obligations is the highest in the region. Unbundling of gas activities related to operation of the gas system from other non-energy activities is required by law. Gas transmission is carried out by the single transmission system operator who also owns the transmission infrastructure. Transmission is fully separated from production and supply activities. Unbundling of distribution system operators (DSOs) is required under national legislation. Only one of 38 DSOs has reached the 100,000 consumer threshold and has unbundled activities. The remaining DSOs obliged to unbundle activities have started activities on this issue.

The Croatian Energy Regulatory Agency is an autonomous, independent and non-profit public institution. The Agency operates in accordance with the Law on the Regulation of Energy Activities adopted in 2007. Its core activities relate to tariff issues, monitoring, licensing issues, etc.

³⁹ Gas sector in Croatia, presentation by Mr. Domagoj Jeić, Ministry of Economy, Labour and Entrepreneurship, Republic of Croatia, <http://www.energy-community.org>

⁴⁰ Croatia, National Report Electricity and Gas, Energy Community Regulatory Board (ECRB), 5 September 2008

⁴¹ Country Report – Croatia, prepared by Slavica Robic, M.El.Eng and Maja Bozicevic Vrhovcak, PhD, December 2007, www.agreenet.info

The law on gas markets, adopted in March 2007, clarifies the regulatory framework and brings it in line with the European body of law “*acquis communautaires*”. Regulation 1775/2005 is implemented through secondary legislation adopted in 2008. Transmission network tariffs are calculated by the TSO based on a methodology developed by Agency, and the final transmission network tariff has been adopted by the Government.

For distribution, the methodology is also issued by the Agency. Amounts are not defined by the regulators but by the DSOs themselves. However, they are subject to decision by the Government. The regulator requests and monitors information related to tariff calculation. All non-household customers have been eligible since August 2007, as have all customers since August 2008. The State-owned oil and gas company is the only active shipper in Croatia and controls 100% of the wholesale market.

Market structure

Croatia is one of the two states in the Balkan region (the other one is Romania) that satisfies a significant part of its natural gas necessities through indigenous extraction. Annually, the country consumes 2.84 bcm (2008 estimates), of which it imports 1.26 bcm from the Russian Federation. Natural gas is actively used in the residential sector and for power generation, while also being employed in the industry as well as for producing fertilizer.

The production, wholesale and storage of natural gas are entirely controlled by “INA” d.d. The oil and gas company is owned by the Croatian State (44.8%), the Hungarian energy giant MOL (25% plus one share), the Croatian Homeland War Veterans’ Fund (7%). The remaining shares are publicly traded on the stock market.

Natural gas transmission is carried out by “Plinacro” d.o.o. The company is fully owned by the national Government and it is the only entity that has a licence for the transport of natural gas. “Plinacro” was formed during the process of separating gas transmission from INA in an effort to unbundle the Croatian gas sector.

The retail market has some 38 distribution/public utility supply companies. The number of companies largely corresponds to the number of different districts for natural gas supply within Croatia. This structure has emerged due to the former legislative framework, which stipulated that the distribution of natural gas was one of the municipal services.

The Croatian gas market is regulated by the Croatian Energy Regulatory Agency (HERA). The Agency is responsible for a whole range of activities—from the supervision of all energy undertakings, through monitoring the degree of transparency and market competition in the energy sector to the issuing of licences and granting of the status of “eligible” consumers.

Liberalization

The legislative framework for natural gas in Croatia is aligned with the EU body of law. The primary legislation covering this area is the Energy Act, the Gas Market Act (in accordance with in line with the Directive 2003/55/EC) and the Act on the Regulation of Energy Activities. A number of bylaws regulate the different tariffs for distribution, supply, storage and transportation of natural gas.

The Gas Market Law is the main legislative act that represents the driver for the liberalization of the Croatian gas market. It introduces the unbundling of energy activities in the gas domain and provides for acquiring the status of eligible consumer since 1 August 2007 by the non-residential customers category, and as of 1 August 2008 by households as well.

Despite the existing legal basis and similarly to the situation in other countries in the region, there is no real competition on the Croatian gas market, for several reasons:

- The retail market is now legally open, but because of the market structure described above the companies do not face real competition and their market shares simply reflect the size

of the municipality they operate in.

- The tariffs for natural gas supply for tariff customers are regulated, while those for eligible consumers are floating. Yet even if the latter are not formally regulated they seem to have developed little since 2006 and remain below the market value. As long as the situation remains the same it will discourage new entrants on the Croatian gas market.

Security of supply

Croatia satisfies only 40% of its natural gas need through imports. Nevertheless, taking into account the steady rise of natural gas consumption, the country is pursuing a policy towards achieving greater security of supplies. For that purpose, a new pipeline has been constructed connecting Croatia with the Hungarian gas transportation system. This provides an alternative route for gas supplies to the one that has been traditionally used (from Austria and Slovenia). The country also seeks to expand its natural gas underground storage facility to a maximum capacity of 1 bcm (currently 0.5 bcm). Finally, it plans to construct an LNG terminal in the area of Krk Island to secure alternative sources of gas supplies for all the countries in the Adriatic region. The terminal has a planned capacity of 15 bcm/year and should become operational in 2014.

Montenegro does not have a natural gas market.

Serbia⁴²

Serbia imports 95 per cent of its gas requirements. Natural gas is imported from the Russian Federation through the transport systems of Ukraine and Hungary. Annual consumption varies between 2.0 and 2.4 bcm. The Serbian Regulatory Agency (AERS) is responsible for determining the eligibility threshold and thus influencing market opening (Energy Law art. 15). The Energy Law does not include a time schedule for market opening. The law envisages accounting unbundling for energy activities performed by one energy entity, and there is one company responsible for natural gas transport, storage, distribution and trade. PE Srbijagas' own accounting rules introduce unbundling, but all activities remain with the one legal entity. There also is no clear deadline defined in the law for legal, managerial and organizational unbundling of the TSO and DSOs. The Minister of Energy and Mining formed a working group to reorganize PE Srbijagas in accordance with EU Directive 2003/55. No company has more than 100,000 connected customers.

TPA is determined in the Energy Law by articles 36-38 and is operational as of January 2007. AERS is responsible for resolving disputes concerning access refusal. AERS is also responsible for determination of eligibility threshold and thus influencing market opening (Energy Law art. 15). No time schedule is yet available for market opening under the Energy Law. AERS approves tariff systems for tariff consumers of power and natural gas, as well as tariff systems for access to and use of the energy transmission and transportation i.e. distribution systems and of natural gas storage facilities and other.

Market structure

⁴² Electricity and Gas Roadmap: Serbia, Energy Community, Ministerial Council Meeting, 17 November 2006, Skopje

The consumption of natural gas in Serbia for 2008 was 2.43 bcm. Of these, 92 per cent are covered by imports from the Russian Federation via a single pipeline that crosses the territories of Ukraine and Hungary.

The State-owned company JP “Srbijagas” is the only wholesale trader and public supplier of natural gas. It imports the natural gas into Serbia from the only supplier “Yugorogas” JSC on the basis of a long-term contract with OAO “Gazprom”.

Regarding the transportation and distribution of natural gas, Serbia is divided into two regions. In the north, JP “Srbijagas” is responsible for the transmission and distribution of natural gas to end suppliers and industrial consumers through the country’s pipeline grid from the Serbian – Hungarian border to the town of Pojate. Some 28 distribution companies with different kind of ownership (private and public) are responsible for broad distribution of natural gas (residential and smaller industrial consumers) in the northern part of the country. In the south, the gas transportation and distribution through the grid from Pojate to Nis is carried out by “Yugorogas” JSC.

The Energy Agency of the Republic of Serbia (AERS) is responsible for regulating the natural gas sector. The Agency was founded by the 2004 Energy Law and is responsible for enhancing and directing the energy market development on the principles of non- discrimination and effective competition.

Liberalization

The 2004 Energy Law represents the basis for the regulation of the Serbian natural gas market. The law is written in accordance with the main principles of the EU Gas Directives and of the with Energy Charter Treaty. It provides for third party access to the country’s transportation and distribution systems based on the principles of transparency and non-discrimination, it establishes the status of “eligible customer” and it prohibits to the management of the transmission system operator (TSO) to participate in the management of other energy entities involved in natural gas distribution and trade.

Despite that, the share of gas market liberalization in Serbia is only about 4 percent. Indeed, currently there are very few “eligible” consumers in the country even though legally some 85% of the natural gas consumers in Serbia have the right to become “eligible” (practically all consumers except households). Yet, even if the percentages of “eligible” customers were higher, it would not have made much difference since there is no real competition in the country’s gas sector. JP “Srbijagas” is the public supplier in the country, but is also the TSO and the most important gas distributor in the northern part of Serbia, while “Yugorogas” JSC is the TSO and the gas distributor in the south.

There are several reasons for the lack of real opening of the Serbian natural gas market: on the one hand, even if some legal foundations are in place, the complicated rules of internal regulation and the underdeveloped juridical base still represent a major obstacle for the entrance of new players. At the same time, the restricted access to new sources of gas supply including technical barriers (lack of appropriate infrastructure) also challenges liberalization of the gas sector. These two factors ,together with the current world economic crisis, are the main impediments to the development of real competition on the Serbian gas market.

For Serbia to achieve true opening of its gas market, several steps need to be taken, including:

- Further adoption of the *acquis communautaire* in the area of energy.
- Ensuring the effective unbundling of transmission and distribution system operators.
- Gradually removing the dominant position of the incumbent company JP “Srbijagas” especially regarding gas imports.
- Promoting the development of gas infrastructure and the removal of technical and legal barriers for natural gas imports.

Security of Supply

Like Bulgaria, Serbia relies on gas supplies from the Russian Federation through the only pipeline that is connected to the country passing through the territories of Ukraine and Hungary, which makes the country vulnerable to gas supply interruptions. In order to increase its energy security the country has recently expanded its gas storage facility “Banatski dvor”. Furthermore the Government has signed an agreement with E.ON for supplies of 200 million cubic metre of gas from the Hungarian gas storage facilities of the German company in case of emergency. Serbia is a committed participant in the South Stream pipeline project, which will provide it with an alternative route of gas supplies.

Albania does not have a natural gas market.

The former Yugoslav Republic of Macedonia ⁴³

The former Yugoslav Republic of Macedonia imports 100% of its gas requirements from Bulgaria. Annual consumption is around 0.1 bcm. The Energy Regulatory Commission is an independent regulatory body established in 2002 through the Law on Energy and is composed of five Commissioners elected by Parliament.

The country has no distribution network, but the Energy Law (Official Gazette of RM, no.63/06) contains provisions for an eventual natural gas distributor. According to Article 6 of the Law, if the legal entity that performs energy activities of public interest also performs energy activities that are not in the public interest, that person is obliged to supply separate accounting for each activity.

The system operator in the corresponding grid code shall establish rules for connection to the corresponding grid and methodology for calculating connection expenses. The following consumer categories qualify as eligible natural gas customers:

- Customers that consume over 10 mcm of natural gas per calendar year.
- A natural gas retail tariff customer’s supplier.

The Energy Regulatory Commission is the regulatory body responsible for pricing issues.

Market structure

The natural gas sector in the former Yugoslav Republic of Macedonia is still in its infancy. The country consumes only 0.1 bcm of natural gas per year, which is used exclusively in the industrial sector and for district heat generation. With the forthcoming construction of a Combined Cycle Heat and Power (CCHP) plant, consumption of natural gas is expected to rise to 0.45 bcm/year.

Since the country does not have its own resources of natural gas, it imports from the Russian Federation through the territories of Ukraine, Romania and Bulgaria. The juncture point is at Deve Bair, on the border with Bulgaria, and from there the natural gas is transported to the capital Skopje via a pipeline with a capacity of 800 mcm. The transmission pipeline reaches only the industrial zone of Skopje where some 30 industrial facilities are connected to it. The system extends along the regions of Kriva Palanka, Kratovo, Kumanovo and Skopje. The gas sector and the relevant infrastructure are undeveloped in the rest of the country. GA-MA—a joint venture founded in 2006 between the Government and the private company “Makpetrol” AD—offers the transport services and operates the transport system for the natural gas pipeline in the country. “Makpetrol” AD holds a

⁴³ Natural gas – an energy necessity for Macedonia: Overview of the Macedonian energy potential, Analytica, July 2008 www.analyticamk.org

licence for trade with natural gas for industrial customers directly connected to the transmission system. Four other companies are licensed to trade with natural gas in the country.

The Energy Regulatory Commission (ERC) is the authority that governs the energy sector in the country, including the area of natural gas. The body sets tariff systems, grants licences for performing certain activities related to energy and prescribes rules for connecting the energy networks. It also awards the status of “eligible” consumers.

Only 1 per cent of the country's total energy consumption comes from natural gas and there is also a lack of appropriate infrastructure for the large scale gasification of the industrial and the residential sector in the country.

Liberalization

Like the other States in the region, the former Yugoslav Republic of Macedonia is a member of the Energy Charter Treaty. As such, it has developed its energy legislation in accordance with the EU body of legislation.

The Law on Energy adopted in 2006 incorporates the most important EU legislative acts related to natural gas such as the Council Directive 2004/67/EC, EC Directive 2003/55 and Regulation 1775/05. The Government has also adopted several bylaws that regulate specific areas of relating to natural gas (e.g. regulating prices for transport, distribution and supply with natural gas; establishing a tariff system for transporting the gas; obtaining the status of eligible customers). These helped reform the natural gas sector in the country and allowed for the opening of the national gas market for eligible consumers—except households—as of 1 January 2008 (with the first qualified consumer of natural gas being “Toplifikacija AD”) and for all consumers until 2015.

Despite the good legislative basis, there have been some practical problems in moving towards the liberalization of the natural gas market in the country:

- The lack of institutional capacity within the national Government for implementation of the legislation (i.e. there is no Ministry for energy).
- The unresolved dispute between “Makpetrol AD” and the Government over the ownership right of the transmission gas pipeline on the territory of the country.
- The slow process of adopting rules and procedures for stimulating gasification of the cities.

All these problems impede the entrance of new stakeholders on the market and halt the development of the much-needed investment for developing the country’s gas infrastructure.

Security of supply

Natural gas does not play a prominent role in the energy mix of the former Yugoslav Republic of Macedonia, and the country uses only about 10% of the capacity of its natural gas transmission pipeline. But this is likely to change as a result of the construction of a new CCHP plant, but also owing to the fact that as the country further develops its economy in striving to cover the requirements for EU membership, it will need more and more natural gas for both financial and environmental reasons. Thus, it would have to develop its primary and secondary gas infrastructure, while seeking to diversify the sources and the routes of gas supply. Both of these tasks require the implementation of a functioning liberalization process.