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Working Party on Gas

Moscow group of experts

STUDY

**“The impact of the liberalization on natural gas demand
and prices in the UNECE region:
gas saving to reduce natural gas demand and enhance energy security”**

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**Moscow
Russian Federation**

TABLE OF CONTENTS

INTRODUCTION	4
CHAPTER 1:STRUCTURE OF GAS MARKET AND PRICING POLICY IN THE UNECE REGION (OVERVIEW)	8
1.1. Gas market in the UNECE region before the liberalization	8
1.2. Liberalization of gas market in the UNECE region	8
United States of America	9
The European Union	11
History of the EU legislation on gas market liberalization	13
Russian Federation	19
The Commonwealth of Independent States (CIS)	26
Azerbaijan	26
Armenia	26
Republic of Belarus	27
Georgia	27
Kazakhstan	28
Kirghizia	29
Moldova	29
Turkmenistan	30
Ukraine	30
Uzbekistan	31
The Balkan states	32
Bosnia and Herzegovina	32
Croatia	33
Montenegro	34
Republic of Serbia.....	34
Albania	34
Former Yugoslav Republic of Macedonia	34
CHAPTER 2:THE IMPACT OF LIBERALIZATION OF NATURAL GAS MARKETS ON PRICES	36
2.1. Introduction	36
2.2. Effect of liberalization on wholesale prices	39
2.2.1. Regulated wholesale prices and liberalization	39
2.2.2. Wholesale gas prices based on other fuels	42
2.2.3. Wholesale gas prices based on gas-to-gas competition	42
2.3. Effect of liberalization on retail gas prices and consumers	45
2.3.1. Progress of liberalization on the retail markets	45
2.3.2. Competition on retail prices	47
2.4. Conclusions	48
2.4.1. General conclusions	48
2.4.2. Conclusions on the wholesale market	48
2.4.3. Conclusions on the retail market	49
2.4.4. Conclusions on the CIS area	49

CHAPTER 3: LIBERALIZATION AND SECURITY OF NATURAL GAS SUPPLY	50
3.1. Gas markets and security of supplies before liberalization	50
3.2. Gas markets in the Russian Federation and non-EU UNECE countries	51
Russian Federation	51
USA and Canada	54
Turkey	55
Turkmenistan	57
3.3. Gas markets in Balkan countries	59
Bulgaria	59
Romania	62
Serbia	63
Bosnia and Herzegovina	64
Former Yugoslav Republic of Macedonia	66
Croatia	67
3.4. Gas market in the European Union	68
3.5. Security of supply on the liberalized gas markets	73
3.6. Conclusion	76
4. LIBERALIZATION OF GAS MARKET AND NATURAL GAS SAVING TO REDUCE GAS DEMAND ENHANCING ENERGY SECURITY	77
Conclusions and recommendations	82
CHAPTER 5: THE ROLE OF LNG IN THE PROCESS OF GAS MARKETS LIBERALIZATION IN THE UNECE REGION	84
CONCLUSION	88
ANNEX 1	91

INTRODUCTION

As customary, the UNECE Working Party on Gas undertakes regional research studies, involving gas companies and organisations of the UNECE region. These studies on various aspects of gas industry operations enable to conduct a comparative analysis of practices, techniques and technologies prevailing in different countries and companies of the UNECE.

At the 19th session of the UNECE Working Party on Gas in January 2009 OAO Gazprom promgaz presented the concept of the new study on impact of the liberalization of the natural gas markets on gas demand and prices. The proposal was based on the results of the previous study “Gas Saving to Reduce Natural Gas Demand and Enhance Energy Security” successfully implemented by OAO Gazprom promgaz specialists jointly with experts of UNECE Working Party on Gas in 2007-2008.

Analysing the experience and mechanisms of effective energy and gas use in UNECE region and major tendencies of energy markets development during the last few years the experts agreed that providing security of the energy supply to end customers will be one of the major tasks of the energy sector in the 21st century. According to the opinion of the contributing specialists, the future gas demand will exceed the existing forecasts, which increases the need not only in more efficient energy saving, but also in taking of concrete measures to increase energy security.

The liberalization reforms of natural gas markets implemented within the UNECE region in the first decade of the new century were originally aimed to improve energy security, as a whole, as well as to reduce the gas demand in these countries through increase of gas suppliers. However, analysing the current situation on the natural gas markets of UNECE countries one can spot a certain difference between the original expectations and present results of the liberalization.

In spite of deregulation the gas prices, on the contrary to the expected energy resources prices decrease by end consumers during the period 2000-2008, we have witnessed significant price increase (according to the related Eurostat data on EU countries, only in the last four years prices increased by 50% in average, whereas in the industry sector - by 60%). Furthermore, instead of securing a large number of suppliers from different companies liberalization brought the formation of the oligopolistic market dominated by a few major sellers through takeover of the smaller competitors by larger companies and, as a result, higher dependence of end customers from these suppliers.

Considering the above, the main goals of the new study undertaken by OJSC Gazprom Promgaz are the following:

To identify the direct and indirect consequences of the reforms on the current situation on the gas market and its participants taking into account the original goals of liberalization;

- To determine to which extent and under which conditions the process of liberalization can contribute to the enhancement of the security of energy resources supplies, lowering of prices for end consumers, satisfying growing global gas demand and more efficient energy saving;
- To study the link between efficient gas pricing and efficient gas use and discuss their possible relevance for increasing gas supplies from the Russian Federation and countries of the Commonwealth of Independent States;
- To consider the potential mechanisms for improvement of the present structure of UNECE member-states' natural gas markets functioning on the basis of the liberalization results.

The main questions which the experts have to study are as follows:

What are the major present results of the liberalisation? Was it a positive factor for the development of the regional gas markets? Was it a driving force of the development or a measure to react on the ongoing market changes? Did it help market players to increase their business efficiency and enlarge market shares? What is the real value of the liberalisation?

As the first step of the Study a special Questionnaire was prepared. Initiated by the specialists of OJSC Gazprom promgaz, it was adjusted by UNECE Working Party on Gas experts. The questionnaire dealt with the evaluation criteria defining various stages and levels of gas market liberalization.

Another step in the Study extraction was done during the first expert meeting on the study, which took place in Moscow on March 26-27, 2009.

The participants of the meeting determined the structure of the study, established the project bodies, defined the list of experts - representatives of companies and member-states to take an active part in carrying out the study, methods of cooperation and communication and Study calendar framework. Mr. Alexey Zorya, the OJSC Gazprom promgaz Deputy Director General was elected as the Chairman of the Study.

The participants also determined the thematic of study chapters and Heads of chapters as follows:

- **Chapter 1.** Structure of Gas Market and pricing policy in the UNECE area;
- **Chapter 2.** The impact of liberalization of natural gas markets on prices;
- **Chapter 3.** Liberalization and security of natural gas supply;
- **Chapter 4.** Liberalization of gas market and natural gas saving to reduce gas demand to enhance energy security;
- **Chapter 5.** The role of LNG in the process of gas markets liberalization in the UNECE Region.

A wide range of experts representing the major energy companies and government bodies of UNECE member-states took part in the development of chapters of the study.

Active participation of many experts from different countries confirmed the concern of international energy sector community to the issue of liberalization and its current significance to the countries of UNECE region.

The success in the Study extraction required conduction of the second expert meeting which was held in Moscow on October 14, 2009 within the framework of the OJSC Gazprom promgaz-organized international Forum “Week of efficient gas distribution and utilization”.

The participants of the meeting discussed the progress achieved so far in work on study chapters. The heads of the study chapters also made presentations on provisional results of the chapters' development.

The current report presents the final results of the Study based on a work of the UNECE Working Party on Gas experts which was carried out within the year of 2009.

The extracted study aimed to be used as a source of strategic information, valuable basis for the strategic decisions on policy development for the UNECE member-states governmental bodies, energy corporations and institutional organisations

The substantial work on the deep investigation and understanding the rules and mechanisms of energy markets functioning implementing by the UNECE, especially by the Working Party on Gas in close cooperation with advanced market participants allows expecting significant progress achievement in harmonising the work of the global energy sector.

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CHAPTER 1

STRUCTURE OF GAS MARKET AND PRICING POLICY IN THE UNECE REGION (OVERVEIW)

1.1 Gas market in the UNECE region before the liberalization

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 60's and early 70's. At the center of the market structure emerged the national transmission companies who were state-owned and enjoyed monopolistic position regarding the import and the distribution of natural gas. There were also privately owned enterprises, like the German "Ruhrgas" who also maintained dominant stance regarding gas transmission on the national gas market.

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 regarding imports, transportation, distribution/storage and supply of natural gas.

The national transmission companies were the owners of the pipeline systems and had the sole access to them. This gave them considerable market power with reference to the customers, including the ability to charge discrimination prices: each customer category charged a price close to that of the available substitutes (oil), consequently being charged the maximum it was prepared to pay.

The natural gas production sector was also in the hands of a limited number of companies usually with significant state-ownership. Such companies were the Norwegian giant "Statoil" and the Dutch "Gasunie". The latter was half-owned by the government and held legal monopolies in export, import and wholesale trade of natural gas.

What concerns the distribution sector, in most European states this market was developed by regional and local authorities in the form of local distribution monopolies. There were also some states, like France, UK and Spain, that chose to integrate distribution with gas transport monopolies.

Finally, in Eastern Europe and USSR the gas market was entirely controlled of the government during the communist era. The natural gas in these countries was considered a public good which was supplied locally at subsidized prices way bellow their market value. In reality, in most of these states the government retained the 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 market in the UNECE region

Liberalization process was initiated in countries such as United States, Canada, United Kingdom and Australia. In the United States, natural gas industry has gone through a metamorphosis since the enactment of the Natural Gas Policy Act of 1978, changing from an almost totally regulated industry to a virtually free market. The British market, for a long time separated from the continental market, was gradually liberalised between 1986 and 1996 and was organised on a competitive basis, with production in the North Sea using a system of short contracts. In 1988, the Commission published the White paper entitled 'The Internal Energy Market' with the aim of the EU Member States to establish a single market in 1992. Clearly, the realization of a single market for energy presented more serious obstacles than for other commodities. From that point on,

liberalization of gas and electricity markets has occupied an important place on the Commission agenda. 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 the first preliminary steps to the opening-up of the European energy markets to competition. This last Directive allowed for using the pipelines of other nominated gas companies, provided that gas crosses an internal European border and was undoubtedly an incentive to the construction of the UK-Interconnector.

United States of America

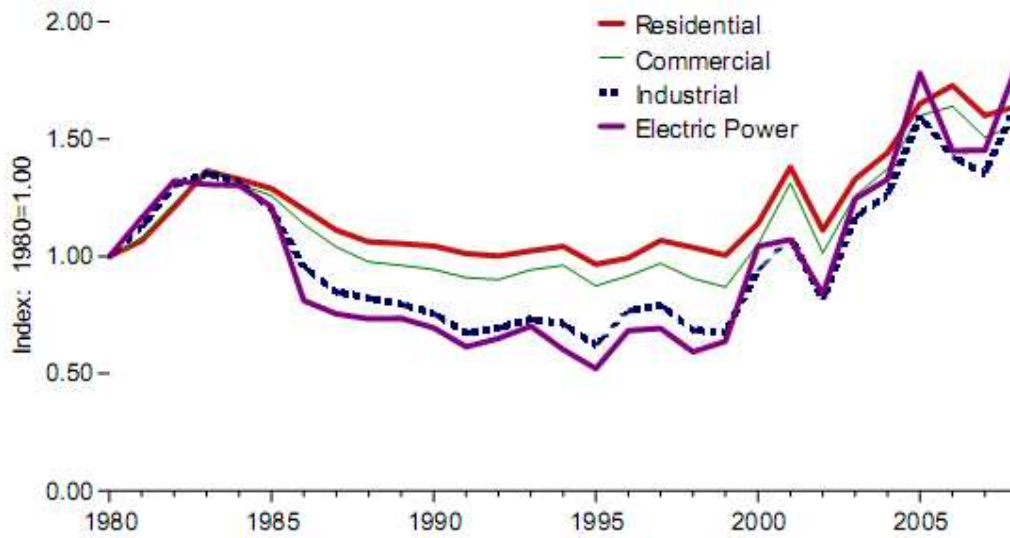
Regulatory oversight of the interstate natural gas market began in the 1930s as a reaction to concerns about the possible exercise of monopoly power by interstate pipeline companies. These concerns continue to be key factors in market monitoring and regulation. However, the natural gas market has changed 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 1978¹). 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 January 1, 1985, when price ceilings on most new gas were removed. At that point, the ongoing abundant supplies of natural gas resulted in a continuation of the downward price trend.

Prices at the producing well became completely deregulated 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. Later, 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 own the gas they transport. Natural gas purchasers can negotiate price provisions directly with suppliers or contract with marketers who can assemble a package of services. Institutional structures, such as market hubs, futures and options markets, and secondary markets for pipeline capacity rights, developed. 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 completely deregulated and have almost stable growing trend since 2003.

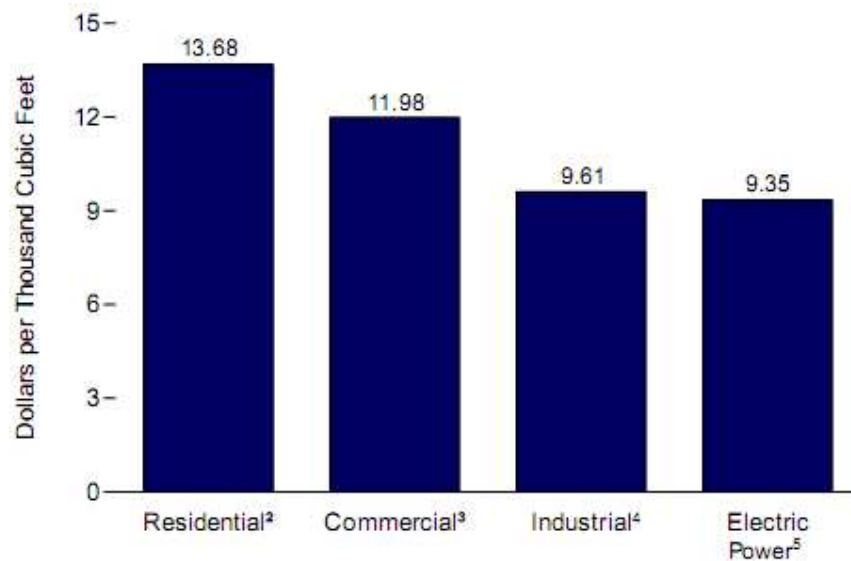
¹ Natural Gas Policy Act of 1978

Table 1. US Natural Gas Prices, Real, Indexed, 1980 – 2008



Source: US EIA Annual Energy Review 2008²

Table 2. US Natural Gas Prices by sector, Nominal, 2008



Source: US EIA Annual Energy Review 2008²

² <http://www.eia.doe.gov/emeu/aer/pdf/pages/sec6.pdf>

The European Union

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

Till the end of the nineties, the European gas market was mainly organised around an oligopoly of producer-exporters (public companies in Algeria, Norway, Russia and the Netherlands) and a buyers oligopoly, including gas companies in European countries, which are in monopoly (or quasi-monopoly) positions on their national wholesale markets.

Relations between the production oligopoly and the national import monopolies were structured by long-term contracts of 20-25 years, which shared the risks. Key elements of this risk sharing were:

- 'Take or Pay' clause;
- 'Final Destination' clause and
- Prices set by a 'netback' formula, linking gas prices to oil prices on the national market.

This business model made possible a continuous growth of gas consumption in Europe and an ambitious development of natural gas fields in the producing countries as well as huge European transmission network.

Prices were most often regulated by governments on the basis of import prices plus operation costs and as a result one can observe on this period quite stable gas prices for all categories of consumers.

This institutional architecture allowed development of stable and mature gas supply systems. The gas industry in general was not dissatisfied with this state of affairs, since the major participants usually worked out trade and transit provisions bilaterally and without serious problems. But increasingly, it appeared that this business model was not in line with the European Community economic principles, based on the neo-classical concepts of free market, minimalist state intervention and competition instead of cooperation. The Commission, which, in those days, had no competencies in energy, underlined mainly three grieves based on its competencies in competition policy: insufficient internal market, non competitive market and abuse of dominant position. Moreover, the current structure is suspected to be an obstacle to the development of gas consumption. Natural gas demand is said to be 'booming' all over Europe. The all-around optimism is fed by a number of structural economic and political developments. The main factors that have been restraining the use of natural gas are either no longer present or will be lifted within the foreseeable future.

It has become clear that natural gas reserves, both on a European as on a world scale, are abundant. Hence, it appears no longer necessary to restrict the use of natural gas for 'high value' purposes only. For example, in 1990 the European Union removed its earlier ban on burning natural gas in order to generate electricity.

Since 1985 natural gas prices have decreased. The fall in oil prices combined with the depreciation of the USD has resulted in considerably lower end-user prices within all European countries. This has made natural gas more attractive versus alternative fuels like coal and lignite.

The low sulphur and carbon content of natural gas compared to other fossil fuels makes it an attractive fuel from an environmental perspective.

The liberalization of the UK electricity market and emergence of highly efficient Combined Cycle Gas Turbines (CCGT) stimulated the use of gas for power generation. It seems likely that the ongoing liberalization of the continental European electricity market will have a similar effect on the demand for CCGT and, hence, for natural gas.

In the EU the market structure remains still quite concentrated. The number of 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 in compliance with 2006. The share of 3 biggest companies in every EU country is very high and it reaches a 100% level in almost half of the EU. The share of 3 largest wholesalers in wholesale market remains extremely high and is above 90-95% in major number of EU countries.

The retail market of the EU is more liberalized. The number of independent suppliers is growing, but in some countries there are few or even no independent suppliers at all (Finland, Greece, Spain etc.). There are more companies with over 5% share in retail market than in wholesale but the number is still low.

Only 12 TSOS (about 25% of the total number) and 620 (42% of the total number) have been unbundled.

In the EU, TPA systems and charges remain quite different from one country to the other. Approximate network tariffs for large users varies from 0,101 €/kWh in France to 0,68 €/kWh in Finland. Tariffs for medium commercial users varies from 0,131 €/kWh in Spain to 1,44 €/kWh in Greece. And tariffs for households varies from 0,118 €/kWh in Germany to 2,86 €/kWh in Slovakia

In spite of deregulation the gas prices are still growing in average in the EU area (around 5% between 2007 and 2008) and there is no obvious link between the level of liberalization and the price changes. For example in the UK, Germany or Austria the price increase was significantly higher than the European average, when it was the opposite in France, Portugal or Romania.

In EU Commission Communication of 10 January 2007, both in the Internal Market report and the Energy Sector Enquiry, the Commission addressed a number of issues to be solved, possibly by introducing new legislation. They are the following:

- Market concentration and market power;
- Vertical foreclosure (in particular the inadequate unbundling of network and supply);
- Lack of market integration (including lack of regulatory oversight for cross border issues);
- Lack of transparency; price formation mechanisms; downstream markets for gas;
- Balancing markets;
- Liquefied natural gas (LNG) markets.

Current legal and functional unbundling is supposed to be insufficient in removing the conflict of interests arising from vertical integration. a company that remains vertically integrated has an in-built incentive both to under-invest in new networks (fearing that such investments would help competitors to thrive in "its" home market) and - wherever possible - to privilege its own sales companies when it comes to network access.

The regulatory framework and the powers of the regulators should be strengthened to ensure the conditions of transparency, stability and non-discrimination necessary for development of competition and for investment. Better coordination of national regulators at European level is, in addition, needed to mitigate the market segmentation resulting from the regulatory differences between Member States. In this sense, it is possible either to improve the present approach, with the disadvantage of continuing to rely on voluntary agreements between 27 national regulators often with different interests, or to formalise the role of the European Regulators Group for Electricity and Gas (EREG) into a European Network of Independent Regulators (EREG+), or lastly to set up a new single body at Community level.

Cooperation of transmission system operators (TSOs) to enable free circulation of gas and electricity within the EU, it is essential to establish compatible technical rules and regular exchange of information, increase investment in the network and, in particular, in cross-border interconnections, and move towards regional system operators.

Reduction in possibilities for unfair competition due to the monopolies held by the traditional operators before liberalisation, the lack of integration and their natural characteristics, in particular low elasticity of demand, the gas and electricity markets are particularly exposed to the risk of dominant positions.

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 is a priority. Other factors may also influence investment, such as the award of emission certificates or specific incentive measures, for example for production of electricity from renewable energy sources.

Consumer protection and public service obligations must be an integral part of the process of opening up the gas and electricity markets. An energy consumers' charter must therefore protect their essential rights: 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.

History of the EU legislation on gas market liberalization

First legislative package. In December 1997 a political agreement on the EU Gas Directive was reached. After being adopted by the Energy Council with a unanimous common position, the EU Gas Directive was finally 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: 'stamp post 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. However, the 1998 Directive, transposed international laws, had only limited effect on competition until 2001. According to the EU Commission, it was due to preservation of vertical integration, prohibitive prices for network access and storage, and insufficient separation between gas trading, on the one hand, and transport and storage, on the other hand. It was decided to propose a new Directive, which was adopted in 2003.

The main components of the 2003 Directive:

Unbundling³: in order to ensure non-discriminatory access to the network and avoid conflicts of interest it is necessary to separate the network business (natural monopoly) from those activities of vertically integrated companies, which compete on the market, namely production and supply.

The basic elements of the unbundling regime are the following:

1. Legal unbundling of the transmission system operator (TSO) and distribution system operator (DSO) from other activities not related to transmission and respectively distribution.
2. Functional unbundling of the TSO and DSO, in order to ensure its independence within the 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.

Legal unbundling

The key message of legal unbundling is that transmission and distribution have to be done by a separate “network” company. However, the network company must not necessarily 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 firstly that the management staff of the network business do not work at the same time for the supply/production company of the vertically integrated company. This applies to both the top executive management and the operational (middle) management.

The company involved in the network business shall not be allowed to hold shares of the related supply, production or holding company. Equally, the issue of shareholding on a personal basis of the management of the network company needs to be addressed in a way that ensures the independence of management.

³ http://ec.europa.eu/energy/gas_electricity/interpretative_notes/doc/implementation_notes/unbundling_en.pdf

TPA. Tariffs for access to the natural gas transmission networks⁴

Article 18.1 of the Directive (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 and repealing Directive 98/30/EC, OJ L 176 of 15.7.2003) requires tariffs and/or the methodology by which they are calculated (or derived from) to be applicable to all system users on a non-discriminatory basis. There is no element of negotiation involved anymore. The prohibition of discrimination requires that comparable situations are not treated differently, unless such treatment is objectively justified on the basis of differences in service levels and/or costs. The tariff (methodologies) for identical services offered by a TSO must be identical.

An entry-exit system is generally regarded as most appropriate for ensuring a non-discriminatory tariff system, where 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 Regulation⁵ and Directive aim at providing efficient and non-discriminatory access to the system. Efficient access implies access tariffs that reflect the underlying efficiently incurred costs. Unduly high tariffs, which do not reflect the underlying costs could easily turn out to act as a barrier to market entry for new market participants and thus restrict competition. Further, non-discriminatory access would in the case of companies holding both supply and network affiliates also call for tariffs which are based on costs incurred. Only cost-based or cost-reflective tariffs would in those cases deny a competitive advantage to the incumbent supplier in relation to its competitors, as long as the incumbent supplier belongs to the same parent company as the network operator.

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.

Market opening: operator market shares, consumer eligibility⁶

The opening up of the markets to all non-domestic consumers from July 2004 and to all consumers in July 2007 requires a series of measures (procedures and methods) to be put in place to enable new operators, the drivers of and serve the very many new eligible customers.

It is essential to establish operational procedures to enable small consumers to genuinely

⁴ 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

⁵ 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

⁶ 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

choose their supplier. The internal market will only deliver its potential benefits if consumers participate actively in the internal market. Consumers must be able to influence suppliers through their choices, bringing forward innovation, diversity and the improvement of products and services, in terms of both quality and price.

The necessary procedures involve among other things consumer information, metering, simple and straightforward procedures for changing suppliers and settlement between suppliers.

Consumer information

Clear and complete information for consumers is one of the keys to successful opening-up of the markets. The new entrants will conduct marketing campaigns, but neutral and appropriate information provided by an independent body will be necessary to reassure the public. General information at national or regional level should inform consumers of the opening up to competition, mentioning expressly that the procedure for changing supplier is simple and free and that there is no risk of an interruption in supply or of lower quality supply and that there is, moreover, a last resort supplier or similar mechanism.

The opening up of markets to a much greater number of customers requires many rules and procedures to be put in place.

The competent authorities must ensure that consumers have access to clear and transparent information. Information campaigns are desirable.

The competent authorities must draw up guidelines relating to:

- Simple and flexible procedures enabling suppliers to be changed without charge;
- Metering of consumption;
- Designation of who will carry this out as well as their responsibilities and the costs involve;
- Any transfer of ownership of meters to the appropriate company and at what value;
- Definition of load profiles and their application thresholds and if the data is not available, rapid start-up of the process of collecting the necessary data;
- Settlement procedures (financial compensation);
- Defining service quality standards, which may be accompanied by financial incentives and penalties.

The competent authorities may also:

- Designate a last resort supplier;
- 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 set of new minimum standards for the involvement of a specific regulatory authority in determining network access conditions, which will imply a change in practice in some Member States. To comply fully with the Directive, the regulator should have the responsibility, resources and full access to information to enable it to:

- Approve a suitable methodology for access tariffs which takes into account the costs of the

- business and other parameters and provides appropriate incentives;
- 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 congested infrastructure, especially those affecting capacity between Member States;
- Carry out an audited account of the use of any revenues from capacity allocation mechanisms;
- Have an involvement in the investment decisions of the 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 or competition law implementing authorities.

There are also a number of areas where it is recommended that the Regulator may also take over 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);
- To facilitate cross-border trade in gas;
- More effective national regulators ;
- To promote cross-border collaboration and investment;
- Greater market transparency on network operation and supply;
- increased solidarity among the EU countries;

The new legislative package includes 1 Directive and 2 Regulations

The new EU Gas Directive⁷ 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 networks⁸ aims at

⁷ 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>

⁸ 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>

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 Regulation⁹ establishes an Agency for the Cooperation of Energy Regulators, 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.

However, the agency's powers will be strictly limited to cross-border issues. "The agency is not a substitute for national regulators, nor is it a European regulator," the Commission said. This will ensure the 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 formalised under the Commission's plans, through the establishment of a European Network for Transmission System Operators. It will have three core tasks:

- Developing harmonised 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 gives The Third Gas Directive?

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 the 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. Investors would be able to keep their participation in the dismantled groups via a system of 'share-splitting' where they are offered two shares for each one that they already own.

Independent System Operator (ISO)

Faced with a veto threat from France, Germany and seven other member states that sent a letter expressing their opposition to full unbundling, the Commission has proposed a possible "derogation" in the form of a "fully independent system operator" (ISO).

⁹ 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>

Under this second option, companies involved in energy production and supply would be allowed to retain their network assets, but would lose control over how they are managed with commercial and investment decisions left to an independent company to be designated by national governments (the ISO).

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 liberalisation 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.

Russian Federation

The status of Russia's domestic gas market as a market dominated by a natural monopoly is explained by the historical development of the nation's unique gas transmission system – the Unified Gas Supply System (the EGSS).

On the domestic gas market, the market participants are:

- Corporate owners of gas supply systems as defined under the Federal Law "On Gas Supply in the Russian Federation": 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");
- Markets represented by local gas supply systems.

The USSG gas market encompasses 55 of the 57 administrative regions in European Russia and 9 West Siberian regions, thus covering less than half of the Russian Federation territory.

In Russia, USSG gas supplies are available to six economic regions, specifically, Central, North-Western, Volga, Southern and partly Urals and West Siberia.

Local gas supply networks are a one-seller market, with the seller providing the entire range of services relating to production, treatment, transportation and sales of natural gas which, in effect, makes them natural monopoly markets. This market segment accounts for 2% of the nation's total annual natural gas consumption.

From the state participation point of view, the gas market can be broken down into the regulated and non-regulated market segments.

Independent gas producers and sellers have an opportunity to offer gas at a contracted price, which is typically 25-30% higher than the wholesale price as specified by Russia's Federal Energy Committee for current year.

1. Access of independent market participants is regulated by the corresponding Russian Government Directive¹⁰.

Independent gas suppliers can access the Gazprom JSC gas pipelines subject to free capacity and are treated on the same basis as Gazprom JSC subsidiaries.

Under the law¹¹, gas consumers are entitled to choose their gas supplier provided that such 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, the services relating to end-user gas supplies and collection of payments for the gas supplied were provided 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, subsequently became independent legal entities incorporated as limited liability companies (LLC).

The status of authorized gas suppliers received by the regional gas companies (RGC) made possible the transfer of the end-user gas supplies and end-user settlement functions to the RGC.

In this manner, gas sales became an independent business process. This allowed to ensure a ring-fenced accounting for costs associated with the supply-marketing function and deduct such costs from the gas distributor tariff and wholesale gas price.

The main indicators of the Russian gas market are detailed in Table 1.

Table 1: Structure of the Russian Gas Market in 2000

Business Processes	Total Number of Companies or Operators Per Business Process	Quantitative Indicators, bln m ³	Percentage of Gazprom JSC, %
Production	More than 20	584	89
Transmission (via the UGSS)	1	634	89
Storage	1	59*	100
Distribution	More than 320	351**	76
Wholesale	More than 25***	351	76
Exports	4	214	81
Imports	4	36	42

* Marketable gas stocks in underground gas storage at the start of the gas off-take season

** Excluding company costs relating to gas transmission

*** Excluding regional Mezhrefiongaz LLC branches

Source: *Gazprom JSC, Federal Tariff Service*

¹⁰ 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.

¹¹ Russian Government Directive № 1445 "On Approval of Regulations for Gas Supply to Russian Consumers" as of December 30, 1994.

The basic rules related to the functioning of the Russian gas market are stipulated by the Federal Law on gas supply¹².

The authority to regulate the activities of Russia's natural monopolies operating in the nation's fuel / energy and transport sectors is vested with the Federal Energy Committee (FEC). One of the main objectives of the FEC was the state regulation of prices and tariffs for products / services of the natural monopolies operating in the fuel / energy and transport sectors.

The FEC 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 the population and all other consumers (see Table 2).

Table 2: Wholesale Natural Gas Prices in 2000*, rubles/K m³

Zone	Consumers (Excluding Population)	Population
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).

It should be noted that differentiation of gas prices depending on the cost of its transportation from production sites to consumers was not introduced until February 1, 1997.

The dynamics of average wholesale gas prices produced by Gazprom JSC and its affiliated bodies is shown in Fig. 1.

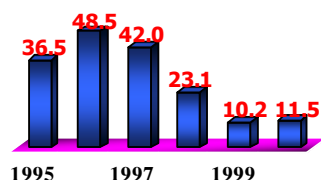


Fig. 1. Dynamics of Russian Gas Prices in 1995-2000, \$/K m³

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

¹² The Federal Law "On Gas Supply in the Russian Federation" № 69-FZ as of March 31, 1999.

The President of Russian Federation Decree¹³, dedicated to the basics of gas pricing, became an important factor for further evolution of 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 supplies.

The Russian gas market reforms are basically 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 with a corresponding gradual slackening of state regulation;
- Development of contractual relationship between gas suppliers and consumers.

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

- Development of 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;
- Development of the market's commercial infrastructure;
- A staged reduction of 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.

Before reviewing the process of the Russian gas market liberalization, it should be clarified what is meant by "liberalization", bearing in mind that in Russia this definition is understood somewhat differently from Europe and given the different goals to be achieved as a result of market liberalization.

The main goals of the Russian gas market liberalization are:

- Increasing gas prices;
- Transition to long-term gas supply contracts.

The main goals of the European gas market liberalization are:

- Reducing gas prices;
- Increasing the share of short-term contracts.

Liberalization of the Russian gas market began with the Russian Government Decree¹⁴, 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.

¹³ President of Russian Federation Decree "On Basic Provisions of Structural Reforms Relating to Natural Monopolies" № 426 as of April 28, 1997.

¹⁴ Russian Government Decree "On Improving State Regulation of Gas Prices" № 333 as of May 28, 2007.

Reforms of the Russian gas market began a little earlier with the issue of Russian Government Decree № 1021¹⁵, 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.

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 January 1, 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;
- The services relating to transmission of natural gas via pipelines;
- Natural gas storage;
- Services relating to gas supplies (sales).

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 JSC¹⁶:

- 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 refueling compressor station networks were united into Gazpromavtogaz;
- Energy facilities, telecommunication services, etc. were handed over to specialized holding companies.

¹⁵ 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.

¹⁶ Gazprom OJSC press release as of March 18, 2005.

Therefore, in Russia, 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;
- 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 the 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 3. Structure of the Russian Gas Market in 2008

Business Processes	Total Number 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 Mezhtregiongaz LLC

At present, there are 58 regional gas companies operating in Russia. Of these, 55 are subsidiaries or affiliated bodies of Mezhtregiongaz LLC.

2. Gas exports are carried out via the single exports channel. In Russia, 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 at Mezhtregiongaz LLC is becoming an increasingly important segment of the domestic market. This electronic trading platform began operating in November 2002. In 2006, the Russian Federation 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 growth 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.

A staged deregulation 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.

The Commonwealth of Independent States (CIS)

Azerbaijan. Availability of own resource base and the Government policy have allowed to diversify the resource base of the country's natural gas balance. Hydrocarbons are locally produced by Azerbaijan's state oil company (GNCAR), local operators, joint ventures and two international consortiums with a mandatory GNCAR participation in all such projects. Shakh-Deniz gas field is exploited by a consortium consisting of BP (as the operator with a 25.5% stake), Statoil (25.5%), LUKOLIL (10%), NICO (10%), Total (10%) and TPAO (9%) with a 10% stake owned by GNCAR. Until 2006, natural gas was imported from Russia. When Shakh-Deniz gas field was put into operation in 2007, Azerbaijan became a natural gas exporter and began supplying gas to Turkey and Georgia. Technologically, Azerbaijan can import natural gas from Iran. At present, Azerbaijan is already involved in swap supplies of gas from Iran.

A peculiarity of the Azerbaijan market is a combination of the state monopoly in the gas transportation business segment and a regulated access of private companies, including companies with foreign capital, in the gas production business segment. 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 consortiums (on the condition that the state-owned GNCAR is a partner).

While this may lead to the conclusion that the gas production business segment in Azerbaijan meets the requirements of liberalization, the main goal of the liberalization of a potentially competitive activity – reduction in gas prices – is yet to be achieved.

The national gas transportation system is owned by Azerigas LLC, a subsidiary of the country's state oil company GNCAR. Azerigas also purchases gas from GNCAR for further resale to Azerbaijani consumers and is actually the monopolist in the gas sales business segment.

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 supplies are compiled using the 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.

Armenia does not produce any natural gas. Gas into the country is supplied by Gazprom JSC (via its Gazprom export subsidiary). Gas imports are delivered via the existing gas infrastructure in Georgia which is characterized by a fairly poor technical condition.

The only existing gas supply route into the country has determined the focus of development of Armenia's gas sector. Armenian government is trying to ensure the nation's energy security by diversifying gas supply routes. The main projects aimed to achieve Armenia's energy security are:

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

Virtually all new projects associated with the development of Armenian gas transmission system are being implemented with the participation of foreign capital in the form of loans and through joint ventures, attracting foreign civil contractors and suppliers of pipes and gas equipment.

Armenian gas market is dominated by a natural monopoly. ArmRosgasprom LLC (with a 75.5% stake owned by Gazprom JSC, 20% - by the Armenian government and another 4.5% - by Itera) is the owner of the gas transmission system, gas storage and distribution facilities in Armenia. 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.

Republic of Belarus. Production of natural gas in Belarus is insignificant. Natural gas is a by-product in the output of oil. Gas is imported from Russia. Some 30% of all Russian gas exports are transported via the Belarus territory.

Gas prices and tariffs as well as the management system for gas supplies to end-users are regulated by the government.

The Republic's gas sector comprises:

- A gas main system with a total length of 7.8 K km, including 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:

- Beltrangaz JSC;
- Beloptgaz, the Belarus fuel and gasification concern (an amalgamation of gas suppliers).

The recent Government decisions permitting the construction of the Yamal-Western Europe transcontinental gas pipeline on the Belarus territory and authorizing the privatization of Beltransgaz JSC may be viewed as a prerequisite for the beginning of the gas market liberalization process.

The Belarus Government has permitted a foreign investor (represented by Gazprom JSC) to purchase a stake at the republican gas transportation company and ensured a centralized handling of gas traffic flows.

One of the possible gas market development areas is diversification of gas suppliers to ensure the nation's energy security and reduce prices for imported gas.

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

Georgia. In the absence of any significant mineral fuel reserves, Georgia is highly dependent on gas imports. Georgia's gas transportation system is 1.9 K km long with a capacity of 20 bcm. Fairly long, Russia (Gazprom JSC, Itera) was Georgia's dominating gas supplier.

A transit gas pipeline crossing Georgian territory is used for delivery of Russian gas to Armenia. In payment for the transit of Russian gas to Armenia, Georgia receives 10% of the total gas volume, which accounts for 12% of the national demand.

Georgia's oil and gas corporation is a joint-stock company fully controlled by the state. Under the Georgian law and the agreement signed with international investors, the corporation represents Georgia in all pipeline projects relating to the transportation of Caspian oil and gas via Georgia to

the international market and is also responsible for the production, storage and sales of oil and gas on the Georgian territory.

The national government's strategy on diversification of gas supplies was implemented in 2007 when Georgia received first natural gas imports from Shakh-Deniz gas field in Azerbaijan.

It should be noted that the beginning of gas supplies from Azerbaijan placed Azerbaijan's state oil company (GNCAR) in a position of control with regard to a major part of Georgia's regional gas market. From 2008, Azerbaijan is Georgia's main supplier of natural gas.

Kazakhstan. The nation's vast gas reserves allow to satisfy the domestic demand and export large quantities of gas.

Kazakhstan's gas sector is relatively new and emerged in the 1970's.

Natural gas is transported across the Kazakhstan's territory via a system of gas mains passing through eight regions and extending to 10 K km. The gas transportation network was built as part of the Soviet system originally intended for delivery of gas to the north of Russia, Ukraine and the Caucasus.

Kazakhstan's gas main is not connected technologically. This precludes the supplies of cheap gas, produced in western Kazakhstan, to the country's northern and southern regions.

This issue is especially acute for consumers in southern Kazakhstan and the city of Alma-Ata. Accordingly, Kazakhstan depends on gas supplies from Russia (the Kustanai region) and Uzbekistan.

The leading companies:

- 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 in the Republic of Kazakhstan is aimed at a maximum development of market relations and development of competitive environment.

The state policy for the development of the Republic of Kazakhstan's fuel and energy complex is aimed at enhancing efficiency and macroeconomic profitability of the producing sector, diversification and creating new areas to ensure further economic growth, and implementing "breakthrough" projects of a global character expected to promote Kazakhstan's becoming one of the world's 50 most-competitive nations.

The government is pursuing active policy to attract foreign investments into the gas sector.

The main goal facing the country's gas sector is utilization of the transportation potential for gas transit from gas fields in Turkmenistan and Uzbekistan, identifying the channels and organizing the sales of Kazakhstan gas in Russia and in Europe.

The government of Kazakhstan has established a favorable regime for attracting foreign investments, formulated the Regulations on natural gas supply, transportation and sales. However, the nation's gas industry remains under the state control.

Further development of the Kazakhstan gas market will be focused on ensuring:

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

Kirghizia. Local output of gas in Kirghizia is insufficient and constitutes some 30 million m³ per year. Gas imports mainly come from the Republic of Uzbekistan. In addition, Kirghizia is paying Kazakhstan for the storage and transit of Uzbekistan gas delivered to consumers in the north of Kirghizia.

The Market structure: the vertically-integrated state-owned Kirgizneftegaz and Kirgizgaz JSC which are responsible for production, transportation and distribution of gas.

Kirgizneftegaz is a natural monopoly in the nation's gas sector. The state owns 86.15% of the company's equity capital. The total length of pipelines on the territory of Kirghizia (together with the gas distribution networks) is approximately 600 km.

Gas price on the domestic market depends on the price for gas purchased in Uzbekistan. A recent increase in the purchase price of gas resulted in a price hike for Kirghizia's consumers.

High dependence on gas supplies from Uzbekistan and instability of gas supplies stimulate active efforts of the Kirghizia government to attract investors to exploit the nation's proven gas reserves (some 6 bcm) and develop gas transportation infrastructure. In particular, the government is considering various forms and conditions of Gazprom JSC's participation in privatizing gas infrastructure facilities in the Republic of Kirghizia.

In 2008, the government of Kirghizia embarked upon reorganization of all the country's state-owned enterprises into joint-stock companies with a subsequent listing of the newly-established companies' shares on the stock market.

Further development prospects for market relations in the country (and especially the gas sector) would be pretty difficult to forecast due to the absence of a reliable information base.

Moldova. Proven gas reserves in the Republic of Moldova are approximately 22 bcm, however, local output of gas is insignificant as the Republic basically relies on gas supplies from Russia.

Moldova has a 862-km gas transportation system, which comprises 73 gas distribution stations. The system's capacity is 44.5 bcm. The Republic's territory is used for pumping Russian gas exports into Rumania. Gas transit is ensured by two Moldova-Gas Co. subsidiaries – Moldovatransgas and Tiraspoltransgas.

Moldova-Gas Co., a Russian-Moldavian JV was established in 1999. Moldova owns 35% of the equity capital, Russia owns 50% plus one share, another 14% is owned by the Transdnestrria-based Tiraspoltransgaz (comprising six local gas facilities) and 1% - by private investors.

In 2009, the Moldova parliament passed a new law on natural gas providing for: promoting competition on the natural gas market by functional separation of transportation and distribution, supplies and production of natural gas. This Act 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. It is expected that the passing of the law on natural gas will promote further development of Moldova's natural gas sector, expansion of its gas pipelines and create a competitive domestic market.

Having ratified the Energy Charter Agreement, Moldova used its framework to harmonize the national legislation with the 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. were based by Moldova on the corresponding international legal acts.

All the above allows to conclude that the Republic of Moldova Government is committed to liberalization of the gas market.

Turkmenistan. Gas industry, which emerged some 40 years ago, remains the locomotive of Turkmenistan economy.

Turkmenistan's gas transportation system unites pipelines with a total length of 8 K km. Turkmen gas is currently exported in 2 directions: to the north (to Russia and Ukraine) and to the south (to Iran).

Gas is produced by the state-owned concerns Turkmengas, Turkmenoil and Turkmengeology. Turkmengas accounts for more than 80% of the total gas output.

Most of the services provided by the nation's oil and gas sector come from specialized divisions of the state-owned concerns Turkmengas, Turkmenoil and Turkmengeology.

At present, all production of natural gas in Turkmenistan is done by the state-owned concern. Operations of foreign companies are limited to the supplies of necessary equipment such as auxiliary compressors, compressor stations and gas treatment units, and to the transportation infrastructure.

In fact, Turkmenistan's gas industry remains under strict government control. All business processes in the industry are distributed between the specialized companies controlled by the state. Accordingly, all reforms of Turkmenistan gas industry relate to internal restructuring.

It should be noted that the government of Turkmenistan is committed to attracting foreign investments and gas sector development.

In October 2006, the members of Turkmenistan's Peoples Council adopted the nation's oil and gas sector development program until 2030. By then, Turkmenistan is planning to produce 250 bcm of gas and 110 million tons of oil per year. The volume of oil refining is to increase to 30 million tons, while petroleum product exports – to 20 million tons.

Ukraine. In Ukraine, gas is produced by three companies, all operating under the umbrella of Naftogaz Ukraini: Ukgazdobycha produces approximately 75% of the total volume, Ukrnafta - approximately 17% and Chernomornaftogaz - 4%.

Transportation of natural gas via gas mains is carried out by Ukrtransgaz, a Naftogaz Ukraini subsidiary.

A majority of gas distribution stations is owned and controlled by the government.

Ukraine's output of gas is insufficient to satisfy demand for gas on the domestic market. 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 Ukrainian gas producers does not exceed 7-8. Pretty 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.

Longer term, it is envisaged that the functions of gas transportation and distribution will be separated and the rights and duties of the companies involved in these operations regulated. For example, suppliers will be obligated 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 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 the state control and regulation.

Uzbekistan possesses own gas reserves. The republic's extensive gas transmission system includes nine gas mains with a total length of 12 K km and a link to the unified gas network of the CIS countries. A peculiarity of Uzbekistan's gas transmission system relates to its location in the middle of Central Asia and its importance for both Central Asia and the European part of the CIS and Transcaucasia.

Uzbekistan's oil and gas industry satisfies 93% of the nation's energy sector in primary fuel resources.

Oil and gas enterprises are united in the national holding company Uzbekneftegaz, established in 1992.

The 2006, President of Uzbekistan decided on a structural reorganization of Uzbekneftegaz holding company (President of Uzbekistan Decree № PP-466 as of August 21, 2006). In essence, the reforms boil down to internal structural changes resulting in the establishment of 8 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.

It should be also noted that, in the last decade, the government has been pursuing the policy of attracting foreign investments within the framework of projects for exploiting new oil and gas fields.

Undoubtedly, strong government regulation of the Republic of Uzbekistan gas market will continue in the future. The government's policy is aimed at diversifying external sales markets for natural gas, and attraction of foreign investors to exploit new gas fields.

The Balkan States

The Treaty establishing the Energy Community was signed between the European Commission and The Republic of Albania, the Republic of Bulgaria, Bosnia and Herzegovina, the Republic of Croatia, the Former Yugoslav Republic of Macedonia, the Republic of Montenegro, Romania, the Republic of Serbia, the United Nations Interim Administration Mission in Kosovo, pursuant to the United Nations Security Council Resolution 1244, in 2006 with main aim to create a legal and economic framework in relation to Network Energy (electricity and gas) in order 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.

After their accession to the European Union Republic of Bulgaria and Romania are no longer members of the Energy Community. Each contracting party has obligation to implement “*acquis communautaires*” on energy. The “*acquis communautaires*” in the field of natural gas include:

- 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 in different stage of development and three groups of members may be identified:

- Croatia and Serbia have more mature markets,
- Bosnia and Herzegovina and FYROM have limited markets,
- Albania and Montenegro do not have gas markets.

Implementation of the Energy Community Treaty obligations is more or less following the maturity of the gas markets and achievements in the process of integration to European Union.

Bosnia and Herzegovina is 100% gas import dependent country. 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.

Legislation framework is partially developed and do not provide full implementation of the Energy Community Treaty obligations. Adoption of proper legal framework is expected soon.

Although present gas legislation requires establishment of independent regulatory authorities, timeframe for this activity is not unified throughout all country. As result of this fact, independent regulatory agency started its operation and covering just part of gas market. Newly established regulatory agency 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. Gas market is traditionally organized, sole gas importer and wholesale trader is at the same time transmission system operator, operating major part of transmission pipeline.

At the level of distribution system operators accounting unbundling is already implemented. There are four DSOs in Bosnia and Herzegovina and all four haven't reached 100.000 consumers threshold.

Gas infrastructure includes just one transmission pipeline and four distribution networks. UGS and LNG systems do not exist. Legislation requires implementation of third party access rules, but this is not implemented yet due to lack of clear legislation and the fact that reform of the gas market just started. It is necessary to further upgrade legal framework on this issue.

Issue of market opening is not equally treated throughout legislation. Timeframe for market opening is not harmonised between laws. Naturally, due to lack of harmonisation of legal and institutional framework no consumers achieved eligible status.

Clear and transparent prices and methodologies are not developed yet. Transmission network tariff is not visible within supply price.

Distribution system operators determine end user prices for different categories of consumers. These prices are adopted by the local governments.

Croatia. Gas market in Croatia is considered as the most mature market among the Energy Community members. Respectively, level of implementation of the Energy Community Treaty obligations achieved so far is highest in the region.

Unbundling of gas activities related to operation of the gas system from other non-energy activities is required by the legislation. Gas transmission in Croatia is carried out by the single Transmission System Operator who is owner of transmission infrastructure. Transmission is fully separated from production and supply activities.

Unbundling of Distribution System Operators is required by the national legislation. Up to now just one DSO out of 38 reached 100.000 consumers threshold and unbundled activities. Remaining DSOs obliged to unbundle activities have started activities on this issue.

Law on Gas Market, adopted in March 2007, clarifies the regulatory framework and brings it almost entirely in line with the "acquis communautaires". Regulation 1775/2005 is implemented throughout set of secondary legislation documents adopted in 2008. Transmission network tariffs are calculated by the TSO based on methodology developed by Croatian Energy Regulatory Agency. Final transmission network tariff is adopted by the Croatian Government.

For distribution, the methodology is also issued by Croatian Regulatory Agency. Amounts are not defined by the regulators but by DSOs themselves. However they are subject to decision by the Government of Croatia. The regulator requests and monitors information related to tariff calculation.

All non household customers are eligible since August 2007. Since August 1st 2008 all customers have the eligibility status. State owned oil and gas company is the only active shipper in Croatia and controls 100% of the wholesale market.

The Croatian Energy Regulatory Agency is an autonomous, independent and non-profit public institution which purpose is to regulate energy activities. Croatian Energy Regulatory Agency is operating in accordance with the Law on the Regulation of Energy Activities adopted in 2007. Core activities of Croatian Energy Regulatory Agency are related to tariff issues, monitoring, licensing issues etc.

Montenegro is a country at the Adriatic coast. For the time being some pieces of legislation are adopted, but Montenegro does not have natural gas market.

Republic of Serbia is around 95% gas import dependent country. 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.

AERS (Serbian Regulatory Agency) is responsible for determination of eligibility threshold and thus influencing the market opening (Energy Law art. 15). No time schedule for market opening in Energy law.

Operation is defined as energy related activity performed within one company responsible for natural gas transport, storage, distribution and trade. There is no clear deadline defined in Energy Law for the legal, managerial and organizational unbundling of TSO and DSO. However the Minister of energy and mining has formed working group which main task is reorganization of PE Srbijagas (over 95% of the market) in accordance with EU Directive 2003/55. All companies are currently with less than 100 000 connected customer.

The Energy Law envisages the unbundling of accounts for all energy activities performed by one energy entity. PE Srbijagas in own accounting rules introduce unbundling but still all activities are concentrated in the one legal entity.

TPA is determined in the Energy Law by art. 36-38 and it is operational as of January 2007. AERS is responsible for resolving disputes concerning access refusal.

AERS is responsible for determination of eligibility threshold and thus influencing the market opening (Energy Law art. 15). No time schedule for market opening in 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.

Albania is a country at the Adriatic coast. For the time being some pieces of legislation are adopted, but Albania does not have natural gas market.

Former Yugoslav Republic of Macedonia is 100% gas import dependent country. Natural gas is imported from Bulgaria. Annual consumption is around 0.1 bcm.

The Energy Regulatory Commission of the Republic of Macedonia is regulatory body which is fully independent from the interests of the energy industry and the Governmental bodies. The

Energy Regulatory Commission is established in 2002 with the Law on Energy and it is composed of five Commissioners elected by the Parliament of the Republic of Macedonia.

There is no distribution network yet in Macedonia, but there are provisions given by the Energy Law (Official Gazette of RM, no.63/06) concerning the natural gas distributor. According to the Article 6 of the Energy Law, if the legal person that performs energy activity of public interest performs energy activity that is not of public interest, that person is obliged in the accounting to supply separate accounting for each energy activity performed of public interest.

The system operator in the corresponding grid code shall establish rules for connection to the corresponding grid and methodology for connection expenses calculation.

The following consumer categories can be qualified as eligible natural gas customers:

- Customers that consume over 10 mmc of natural gas per calendar year; and
- A natural gas retail tariff customer's supplier.

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

CHAPTER 2

THE IMPACT OF LIBERALIZATION OF NATURAL GAS MARKETS ON PRICES

2.1. Introduction

This chapter will examine the impact of the liberalization process on prices of natural gas. It will focus on both wholesale and retail markets. In our analysis there are several general observations we should take into account. The first one is the reference level. We cannot attribute all price changes which occurred in a market where a liberalization process started to the liberalization process itself.

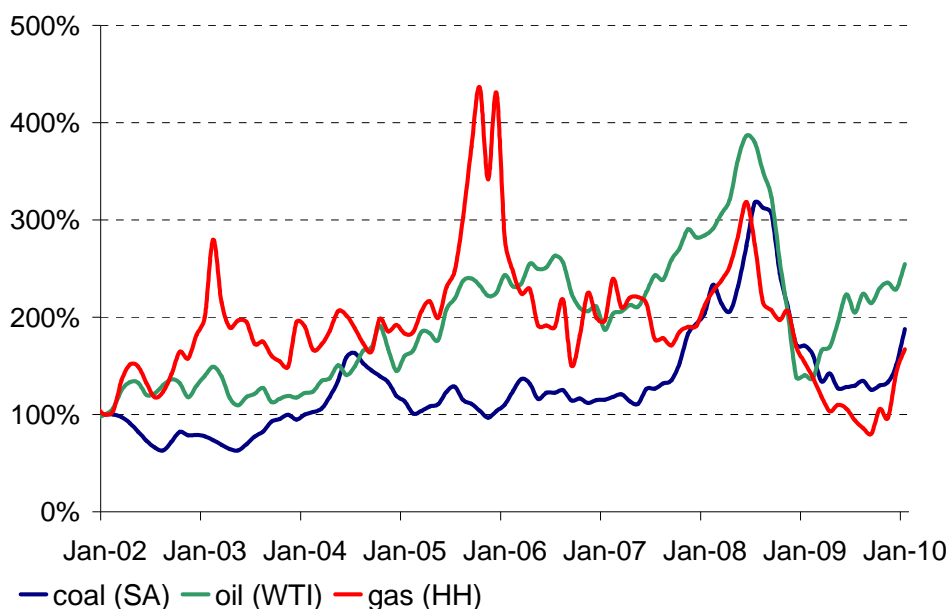


Figure 1 Price developments of coal (Richards Bay FOB 6000kcal 1%S 6A NAR), oil (WTI) and gas (Henry Hub)^{17,18} in the period 2002-2009. Note that bases for calculations are Euro per ton, barrel and MBtu respectively

In 2009, prices for natural gas at the Henry Hub, were more or less similar to the prices in 2002. Nevertheless in the period in between, they have been 4 times as high and generally been 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% as well. Oil prices rose up to 4 times their 2002 level and are still 2 times as high as they were 8 years ago. 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 nations, whereas the price decrease is attributed to a decrease in demand as effect of the financial crisis. In other words, in the period when market reforms in Europe took place, the main changes in prices reflect supply and demand fundamentals, making it difficult to filter out the effects of liberalization.

Another interesting effect is the role of currency exchange rate. As an effect of macroeconomic fluctuations and currency defense policies of governments, the value of the US dollar has changed

¹⁷ Platts

¹⁸ www.oanda.com for exchange rates

over time in comparison to the Euro, the British Pound or the Russian Ruble. As most benchmark prices for commodities are expressed in US Dollars, this has an effect on prices and on price perceptions as well.

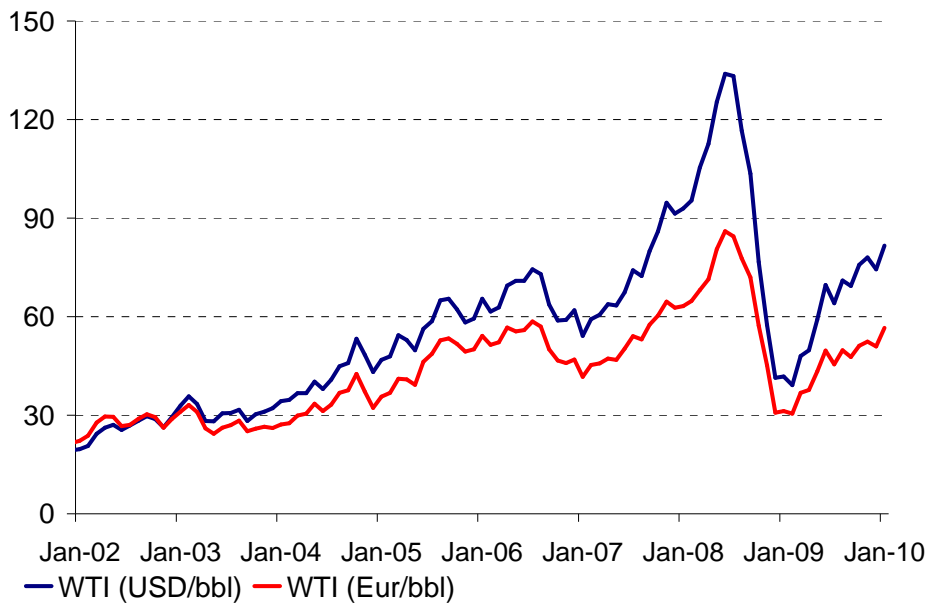


Figure 2 Development of oil price (WTI) expressed in US dollars and Euro per barrel^{17,18}

Figure 2 gives a nice example of this effect. In the period 2002-2004, the US dollar and the Euro were more or less on par. After this period, the dollar devaluated compared to the Euro, making oil ‘cheaper’ in Europe. As large parts of Europe use oil indexed price formulas for gas, this has kept the impact of oil price rises relatively moderate, as the oil price rose to 5 times its 2002 value in dollar terms, but ‘only’ 3 times its value in Euro terms.

Elaborating on this issue even more: the purchasing power of individuals naturally determines how consumers perceive prices. A gas price which is “high” in absolute terms is less of a problem for a rich individual than for a poor person. The gas price in Denmark is among the highest in Europe, but when measured against the purchasing power, the price in Denmark is around the European average.

After a series of events in the winter of 2005/06 (Hurricanes Rita and Katrina in the US, fire in Rough storage in the UK, nuclear outages in Japan, shortages of hydropower in Spain and severe winter weather in Europe), the IEA concluded¹⁹ 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 markets formerly separated started to interact with each other at times when the first effects of 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.

¹⁹ Natural Gas Market Review 2006: Towards a global gas market, IEA, Paris, 2006

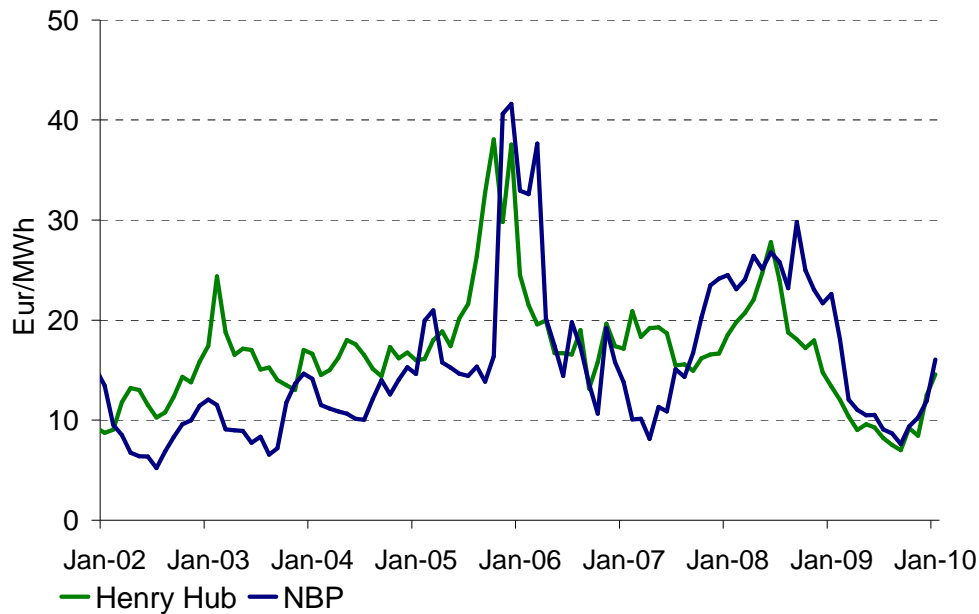


Figure 3 Development of Henry Hub and NBP prices

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). Separated by more than 9000 kilometers, 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.

In Europe, gas was traditionally sold on an oil indexed base. With the development of gas trading platforms, first the National Balancing Point (NBP) in the UK 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-to-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 were gas from the UK competes with gas imports from the continent, Norway and LNG. It is clear that 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 differences, both positive and negative. Several examples show that the use of the flexibility in the long term contracts is already heavily affected by the spot market. Vice versa, the spot market at times also imports ‘oil links’.

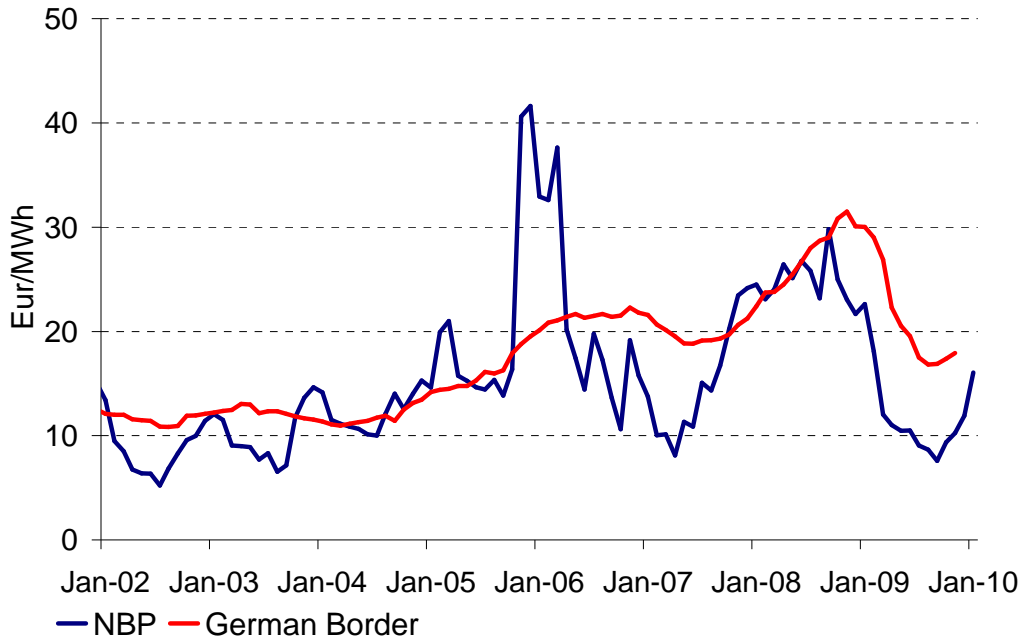


Figure 4 Development of German border and NBP gas prices

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 a rather low variation in prices if tax is excluded (although there certainly is a difference). The tax varies however widely between the same countries, ranging (in this category) from 5% in the UK to over 100% in Denmark. A consumer in Denmark perceives its gas price to be almost twice as high as in France, but this is mainly due to the fact that he pays much more tax.

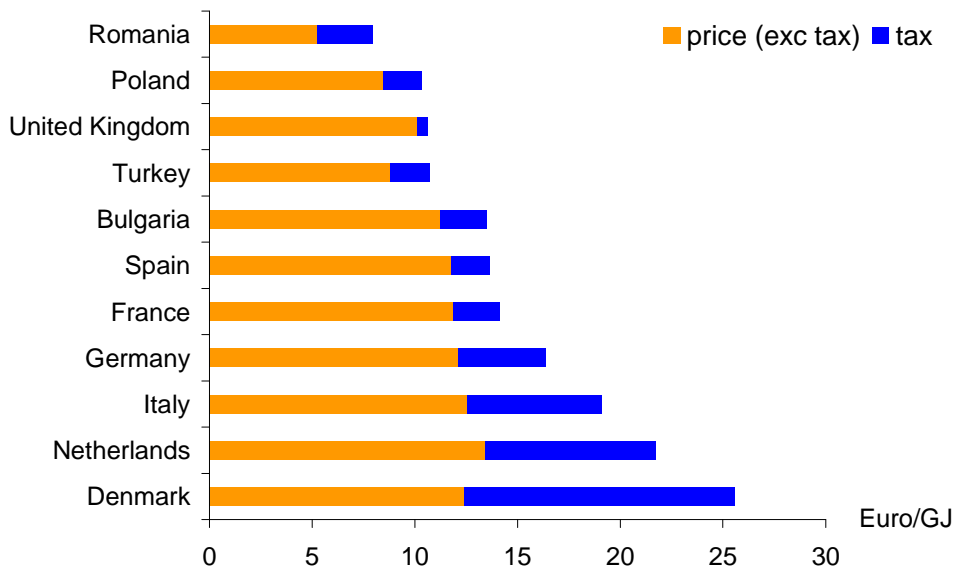


Figure 5 Large domestic (>200GJ) consumer prices in and around Europe²⁰

²⁰ Eurostat

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 hence not the absolute price level that is important, but whether a price is 'fair', or reflecting real market conditions.

2.2. Effect of liberalization on wholesale prices

There is a wide spectrum of price formation mechanisms on the wholesale gas markets, but we can roughly speak about 3 different groups:

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.

Very often the final price is either directly or indirectly determined by a combination of the three mechanisms.

2.2.1. Regulated wholesale prices and liberalization

The fact that prices are regulated implies that they are not liberalized. Yet it is possible that markets with strict price regulation show a certain degree of liberalization, as long as it is possible for various parties to participate in the market under equal conditions and compete with each other for their share in the market. We will briefly discuss this principle by providing examples from the past and from the present.

In the USA, in the period before 1978, several attempts were made to regulate well head prices on a cost plus basis. This increased demand, as gas was getting more competitive than alternative fuels. On the other hand it decreased incentives for producers for exploration and production. Ultimately this situation led to shortages in states which did not have their own production. The Natural Gas Policy Act deregulated wellhead prices for producers hence allowing for more competition and more incentives for producers. The USA is now considered to be the most liberalized wholesale market.

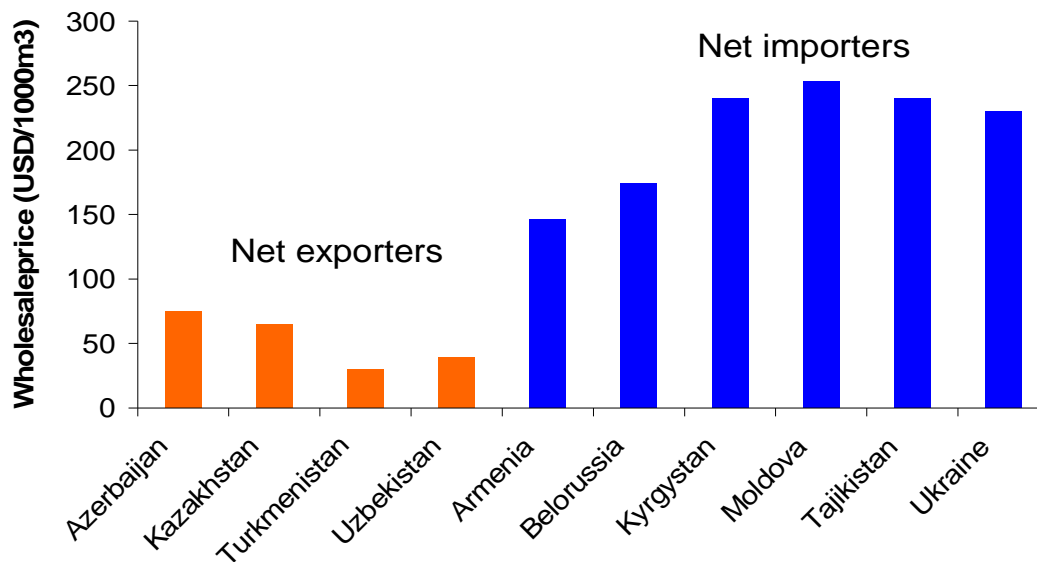


Figure 6 Wholesale prices in selected FSU countries. (Note that data are a mix of 2008 and 2009 data and contain estimations. The graph should be seen as an illustration of the price differences between producing and consuming countries, rather than providing exact data)

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 most often does not lead to the most effective use of the resource, nevertheless it can be an effective tool, especially when the country is isolated and exports of the gas are not possible. Figure 6 gives an illustration of the difference in prices between selected producing and consuming countries in the FSU. Whereas the producing countries can certainly not be called liberalized, certain elements of competition exist, for example for acreage, licenses and in production.

In Russia, 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. 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 in September 2007. 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 Czech Republic) was around \$157 per MCM. The latter effectively prevents interfuel competition and skews Russia's energy consumption patterns even more in favor 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 Russian 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 however not 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 will stay in balance while still a certain level of price stability and control can 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 will 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

It is well documented that 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 ensures the best market price for the seller. The liquid character of the oil market ensures the buyer that a gas price based on this market is not susceptible to manipulation. The last point is of special importance if there is only one or a 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 its advantages and disadvantages in a competitive market. Figure 4 has shown that 2009 has seen a long period where oil based prices were above spot market prices. This has provided an ideal situation for new entrants to conquer market share aggressively. Incumbents relying on the oil based contracts however were not that flexible to adapt to the market circumstances quickly.

Indexation to competing fuels is practiced in the largest part of (South) Eastern Europe. As most of the countries in this region rely on a single supplier, this seems to be an effective solution to avoid distrust over price formation. In the countries of the Energy Community it can provide an effective mechanism of price control during periods when exemptions to competition are in place to stimulate the establishment of the gas market.

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

The liberalization process aims to open the market for competition, but a precondition for competition is the availability of various suppliers. It makes sense that competition arises first there where several suppliers can reach the market. A good example is Spain which has pipeline imports from Algeria and Norway and LNG imports from Algeria, Nigeria, Trinidad & Tobago, Norway, Libya, the Middle East and Egypt. Another good example is the UK, where the decreasing domestic production has attracted LNG suppliers from around the world and enlarged pipeline imports from the Netherlands, Belgium and Norway. Naturally for these countries it is easier to develop competition than for a country in central Europe with limited access to gas other than Russian gas.

By observing the development of the spot markets, we can see that indeed competition is developing, be it slowly, starting from the West and spreading to the East. The US and the UK have been the front runners in the development of the gas hubs with Henry Hub and National Balancing Point the most prominent examples. From there Belgium and the Netherlands followed with the Zeebrugge and the TTF hubs and after that France (PEG), Italy (PSV), Germany (NCG) and Austria (CEGH).

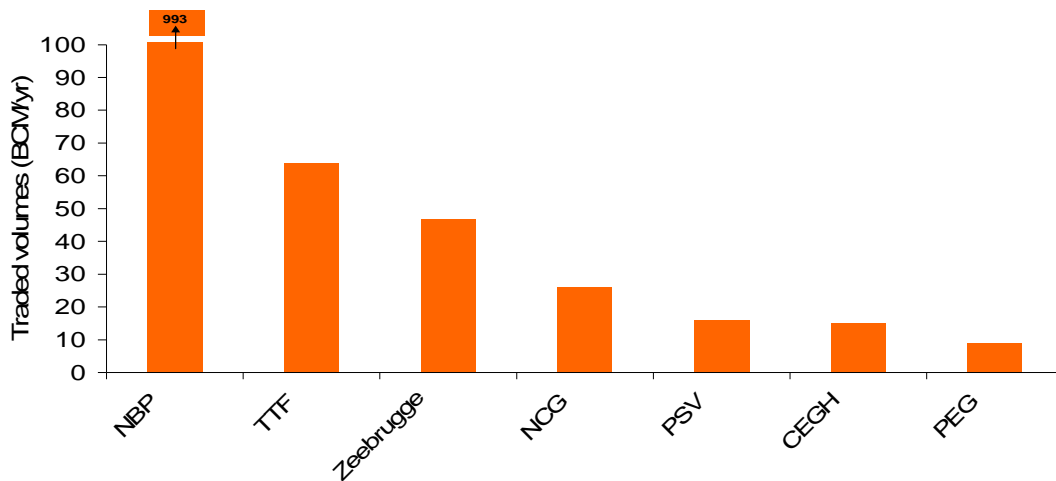


Figure 7 Traded volumes on European gas hubs²¹

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.

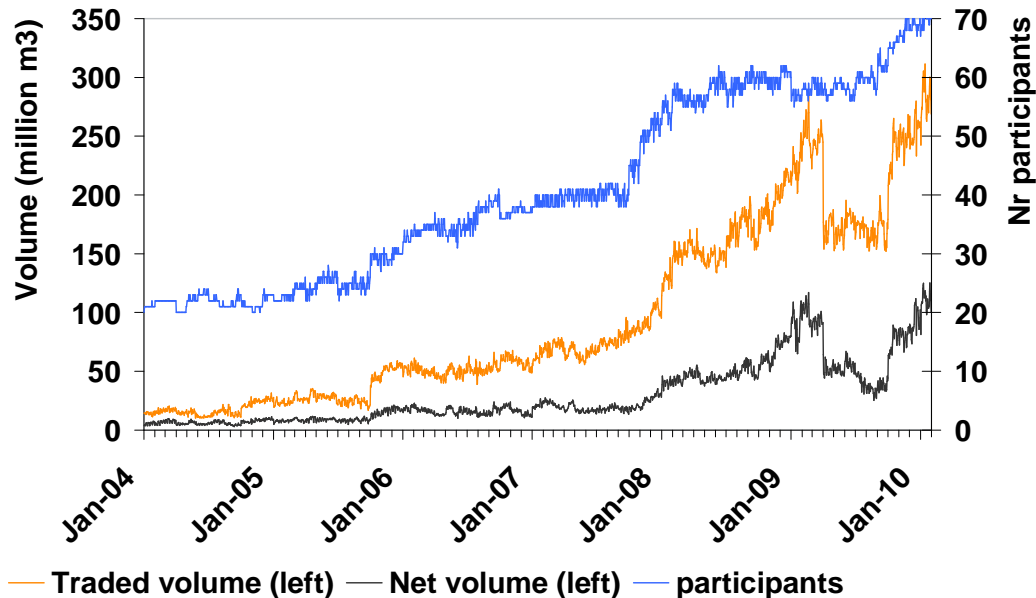


Figure 8 Development of the TTF hub²²

Figure 8 shows the development of the TTF hub from 2004. Both volumes and participants keep increasing. A similar picture could be given for most of the other hubs. As the overall demand in Europe is not significantly increasing, it can only mean that trading on hubs gains importance. At

²¹ WGI, Feb. 2009

²² www.gastransportservices.nl

the same time it is clear that apart from the UK, the largest part of the gas volumes is still delivered outside of the hubs.

In general we see that the market share of the 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. Due to 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 TSO's 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 shows that gas prices determined by gas-to-gas competition can both be lower and higher than prices determined otherwise. Gas to gas pricing does however provide the advantage that the market situation is 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.

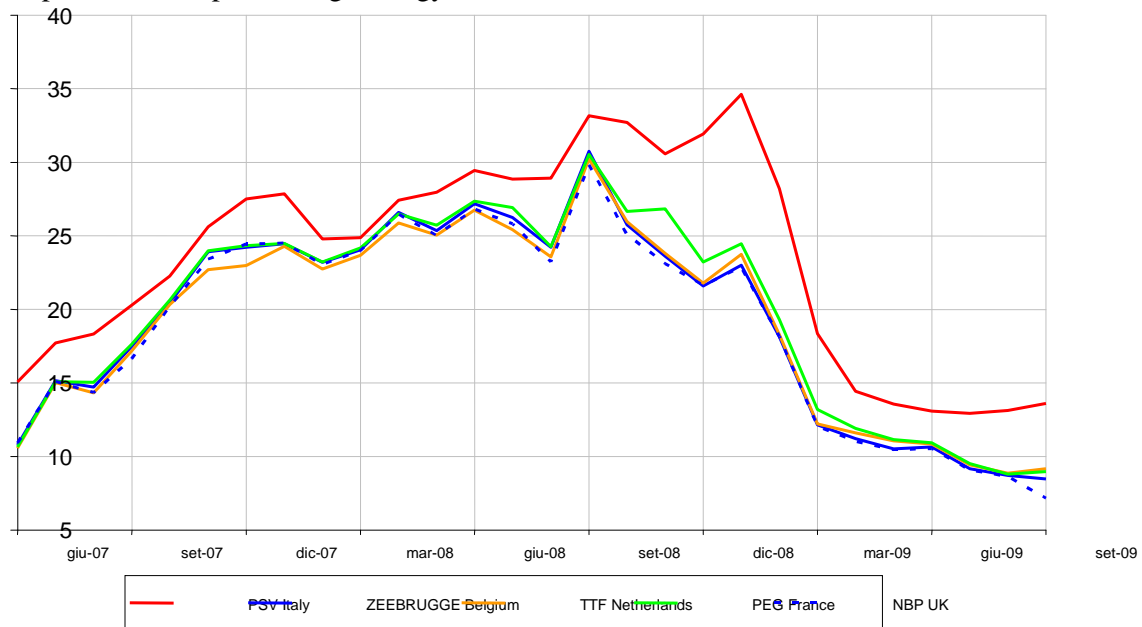


Figure 9 price developments at main continental European hubs

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 Russia as well. Gas exchange trading in Russia started in late November 2006, with the following three goals:

- to experiment with developing spot trading in nonregulated 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).

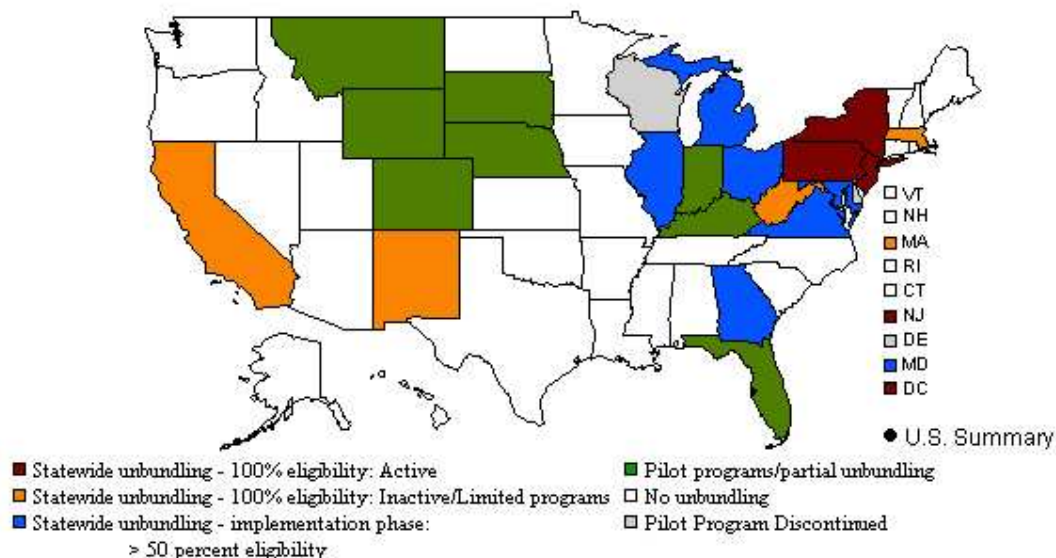
In 2007 up to 10 BCM were scheduled for sale at the gas exchange (5 BCM by Gazprom and 5 BCM by independent gas producers), but only 6.75 BCM were actually sold. For 2008 the target was raised to 15 BCM (preserving the general parity between the sales by Gazprom and by independents, with the former allowed 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. There have been no sales in 2009, owing to the absence of a governmental resolution for this 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 Russia. The crisis will pass, sooner or later; it is worth keeping the institutions that enhance competition and efficiency. Besides, according to the current Russian government plan, beginning in 2011 gas prices in Russia will not be regulated (initially for industrial users, but after some 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 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 US there are 21 states and the District of Columbia that let residential consumers and other small customers purchase natural gas from other than their traditional utility company. This makes 54% of all US residential customers eligible for choice. Within the states participating, 82% is eligible for choice. However only 13.5% of the eligible consumers actually uses this option. Customer participation levels vary from almost 0 to 100% between states and the amount of active marketers ranges from 4 to 14, with only New York having 50 active marketers. Only limited data is available on price effects for the consumer making it not possible to draw conclusions on the efficiency of retail competition in the US²³.



²³ State of the markets report 2008, FERC, 2009

Figure 10 US lower 48 states offering some form of retail competition²⁴

In Europe a similar picture appears: Only 8 out of 23 countries have abandoned price regulation in the domestic market segment according to ERGEG²⁵. In the market segment with larger customers, 15 out of 23 countries have no price regulation. The results of ERGEG's observation are given in Table 1. In most of the countries where price regulation exists, a free market price also exists, so the regulated price basically offers a fall back mechanism. The report also mentions that the regulated price is higher than the free retail price in all countries apart from France and Hungary. This could be due to the fact that the report bases itself on July 2008 data, when wholesale market prices were increasing rapidly. Often the regulated prices follow the wholesale prices with a time lag and hence the opposite situation should be true in times of decreasing prices. Ten of the countries where regulated prices exist next to free prices, report that more than 95% of the households chooses regulated prices.

Likewise in countries with no price regulation, a mechanism can exist which will make sure that vulnerable customers are protected from the market forces. For example in Belgium the regulator, CREG, does not set maximum tariffs in general. In order to protect customers a social maximum tariff is available for customers in vulnerable positions. To determine the eligibility for the social tariff, a customer has to prove that he has access to other government support already.

Table 1 Overview of market opening and price regulation in open gas market segments as of 1 July 2008²⁵ (See ANNEX 1)

Looking at the UK which kicked off the liberalization process we see that British gas is still the largest supplier of gas in the retail market with a market share of 47% in 2007, its share is steadily decreasing. 5 other suppliers however have each around 10% market share as well. Switching rates are up to 18% per year. Retail prices reflect wholesale prices and suppliers offer a wide range of products, from green energy to fixed price, leading the national regulator to conclude that markets are competitive. Immediately after the start of the liberalization process, the retail tariffs were subject to price control. In the period 2000-2002, price controls were lifted completely.

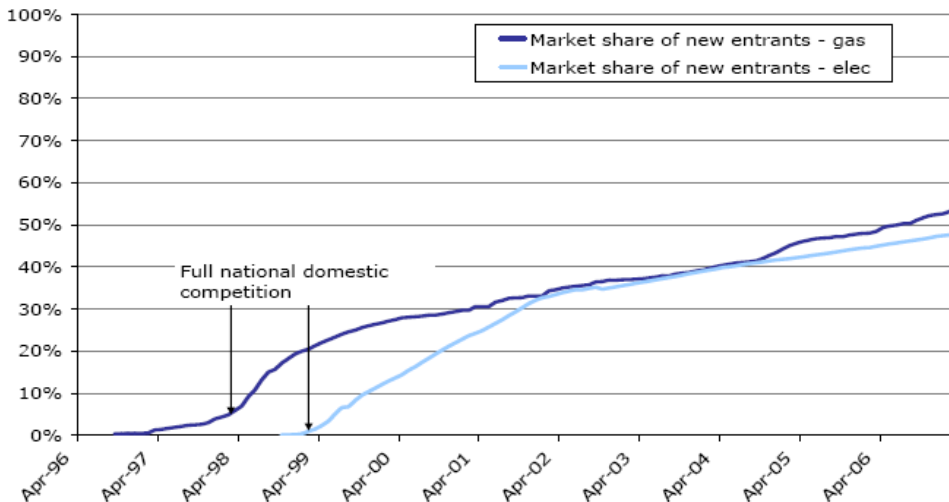


Figure 11 New entrants in UK gas and electricity market²⁶

²⁴ Energy Information Administration

²⁵ Status review of end user price regulation as of 1 July 2008, ERGEG, 2009

²⁶ Domestic retail market report: June 2007, Ofgem, 2007

2.3.2. Competition on retail prices

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

As Wallonia was liberalized 4 years later than Flanders, the intermediate period allowed comparing price developments in Belgium in both 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 a switcher could in 2008 achieve a potential saving from 75€ to 150€ per year on its 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 customers²⁷.

In Italy a domestic client on the regulated market pays on average 4,25 c€/m³ more than on the free market, a commercial client 3,65 c€/m³ more, an industrial client 7,39 c€/m³ more, and, finally, a power generation client (few clients of small-mid size) pays 6,87 c€/m³ more on the regulated market than on the free market.

In France each customer has the choice between two different types of contract: On the one hand 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 on the other hand contracts at market prices (offered by incumbent suppliers and alternative suppliers). End Q2 2009, 13% of the connections had a contract at market price and 6% have 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, in terms of energy, about 90 % of the total gas market has changed supplier since the beginning of liberalization, and in terms of number of clients, nearly 40% of clients have changed supplier since the opening of the domestic market in 2003 (2,7 millions 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 decided by the Law 12/2007. The structure in the retail gas market has changed during the last years. New entrants have got nearly 40% of market share and there is a strong competition. Actually 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 near to 90% of the retail market share.

So competition on price takes place in the retail sector. The consumer however is reluctant to switch. The Dutch report²⁷ mentions that from the domestic customers almost 40% claim not to switch for price reasons and more than 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 for the administrative burden and unwilling to spent time and energy in the search process. Consumers generally switch when they

²⁷ Assessment of the Effects of Tariff Regulation on the Dutch Residential Retail Markets for Energy, Boaz Moselle, The Brattle Group, 2009

move, after reading about the energy market, after receiving a bill or as a result of direct marketing activities by the retail companies.

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 will now take temporary measures to protect vulnerable customers and will introduce new guidelines aimed at higher transparency and engaging customers in the competition process²⁸.

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 go after the best offers.

2.4. Conclusions

2.4.1. General conclusions

Liberalization is in various stages of development throughout the UNECE. Most countries which have obliged themselves to a liberalization process do comply with its formal requirements, but rarely (if at all) do they claim that they have reached a satisfactory end state. Rather it becomes clear that liberalization is a process which takes time and continuous adjustment of means and goals. Nevertheless the study shows that in markets where liberalization is most advanced, price benefits can be realized by customers, especially on the wholesale level. The downside is that gas prices tend to be more volatile and there are fewer possibilities for governments to control. A last general conclusion is that liberalization leads to more integration and interconnection, as companies start doing business in neighboring markets. We will continue with more specific conclusions on the wholesale market, the retail market and the CIS.

2.4.2. Conclusions on the wholesale market

With the exception of North America, the wholesale market in the UNECE is still dominated by the incumbents. The lack of free firm transport capacity is often cited as one of the main reasons for a slow development of competition. As infrastructure projects have long lead times and incentives for companies to build new infrastructure are either unclear or unattractive, this means that 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 the liberalization process 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 neighboring markets. They have a preference for large growing and changing markets. The best example is probably the UK, 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 neighboring countries have built large pipelines to the UK and a number of large LNG receiving terminals are built as well. Large customers are often the first target for new entrants who compete on price, as price is often the determining factor for choosing a supplier for large customers.

²⁸ Energy supply probe: proposed retail markets remedies ,Ofgem, 2009

Gas trading platforms (hubs) are developing everywhere and often show growing trends²⁹. Gas-to-gas competition leads to both up- and downward pressure on gas prices when compared to oil prices, but due to the depressed gas demand in the largest part of 2009 the downward pressures are currently most obvious. As a result of the increasing importance of gas-to-gas competition and fast changing market conditions, new contract types and pricing models keep appearing.

2.4.3. Conclusions on the retail market

Only a few retail markets are completely deregulated, most markets 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 slow, the incumbent remains dominant, but loses share. Like in the wholesale market, the most successful new entrants are incumbents from neighboring 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 possibility to switch and which benefits can be achieved, which is a concern to policy makers. 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 behavior in their price offers by giving more competitive offers to 'active' customers. Since the 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 presents, energy saving advice and fixed and flexible tariffs.

2.4.5. Conclusions on the CIS area

Russia, as the largest country in the CIS, has 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 is to attract investment, and increase energy efficiency and production. The gas exchange and increasing activity of independent producers are promising signs and a lot more can be expected if the electricity sector serves as an example.

Whereas a lot of countries hope that liberalization will put pressure on prices, Russia uses regulation as a measure to increase prices to a level competitive with export prices. Low prices have been a Soviet legacy in many CIS countries but rising import prices now change the picture. As high energy 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 prices for consumers 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.

²⁹ 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.

CHAPTER 3

LIBERALIZATION AND SECURITY OF NATURAL GAS SUPPLY

3.1. Gas markets and security of supplies before liberalization^{30 31}

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 60's and early 70's. It was in these early years of the natural gas market development that the energy sector became increasingly politicized. The two oil crisis of 1973 and 1979 brought the issue of energy security on top of the decision-makers' agenda in the Western states. Thus, government involvement was deemed crucial for achieving the security of natural gas supplies, taking in mind that many of the supplier countries were considered politically unstable. In addition to that, political rationale dictated the governments' strategies towards achieving security of supplies. For instance, in Western Europe there existed the widespread belief that dependence on imports from the USSR must be constrained. In order to counter that, the governments of France and Italy encouraged the purchase of Algerian gas for disproportionate prices as a kind of implicit foreign aid.

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 regarding 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 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 the discrimination 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 pursued 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, a purchaser was in a stronger bargaining position to negotiate the terms for his future supplies if he had a diversified portfolio of long-term contracts. Otherwise, the buyer risked to be put in a situation, where under pressure he had to accept gas supplies under less favorable 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

³⁰ Marian Radetzki, European Natural Gas: Market Forces Will Bring About Competition in Any Case, IAEE Newsletter, Third Quarter 1998

³¹ International Energy Agency, Regulatory reform: European Gas, Market Energy Reform 2000

been far less willing to launch large scale production investments.

As a result, the structure of the Western European natural gas market that came in place during the second half of the last century fulfilled the very important task of establishing reliable and secure systems of supply: the big national monopolies developed the necessary gas infrastructure, while the long-term contracts became the backbone of the supply reliability especially in countries that had to rely strongly on gas imports. Consequently, natural gas began to play an important role in the European energy mix to the benefit of the European states.

On the downside, the emerged gas industry did little to achieve cost-efficiency and customer care. The higher gas prices that were applied by the incumbents meant that the costs for the development of the gas sector were, in fact, covered by the end-user. And while this may have been justified in the early stages of growth of the gas markets, it became inefficient in the long-run as it restrained the expansion of the gas market.

3.2 Gas markets in the Russian Federation and non-EU UNECE countries

This section examines the natural gas sector in the non-European UNECE member-countries. In the beginning we look at the Russian Federation since the country is among the biggest factors 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.

Subsequently, an overview of the USA's and Canada's gas sector is provided as the countries are the pioneers of the natural gas market liberalization. In the United States the enactment of the Natural Gas Policy Act of 1978, changed the natural gas completely moving from an almost totally regulated industry to a virtually free 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.

Further we look at Turkey, whose specific geographic location has prescribed it an important role in the context of European energy security. Indeed, in the last years the country has opted to participate in a number of energy projects with the aim of becoming a strategic energy hub.

Finally, this section examines Turkmenistan – a country with has natural gas resources that attract the interest of the EU, but also of other non-European energy-hungry states.

Russian Federation

Russia is a major global energy market player capable of contributing significantly to the stabilization of markets and the reliability of global energy security. In the area of natural gas Gazprom is among the top producers of blue fuel and the largest company in terms of the natural gas reserve size. As of December 31, 2008 its gas reserves (Russian standards) were estimated at 33.1 trillion cubic meters. Under the PRMS international standards the company's proven and probable hydrocarbon reserves were estimated at 27.3 billion tons of fuel equivalent worth USD 230.1 billion. With 17 percent of the global gas production, the company is one of the leading gas exporters.

Gazprom is special for being simultaneously a producer and a supplier of energy resources, as well as for having an extensive resource base and a branchy gas transportation infrastructure. Due to Russia's geographical position, Gazprom has the potential to become an energy bridge between European and Asian markets via supplies of own natural gas and gas transit services rendered to other producers.

What concerns gas supplies to European consumers, the provisional estimates point that the share of Russian natural gas in Central and Western Europe's energy consumption and import structure has already reached 27 and 35 per cent, respectively. With that in mind, one of the main priorities of Gazprom on the European market is to secure the reliability of gas supplies. To achieve this objective Gazprom is planning to develop a system of underground gas storage in the region, as well as to develop relationship with traditional consumers on the basis of long-term contracts which take into account the need to finance long-term investment cycles that are considered to be the key factor for business stability and energy security. Indeed, one of the main purposes of the long-term contracts is to guarantee the reliability and stability of gas supplies for both the importers and consumers. Long-term contracts meet today's strategic interests of all gas market participants by providing multi-year commitments for gas consumption and ensuring pumping gas to the consumer in the claimed volumes with the required daily and annual supply flexibility.

Internal market

At present, the Russian gas market is comprised of two sectors: regulated and deregulated. Of these the bigger is the regulated market. Gazprom is the major supplier in this sector. The 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 Mezhhregiongaz 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 meters of gas at market-based prices.

With regards to internal energy consumption, the energy efficiency is currently a major issue on the table of the Russian decisionmakers. The effective utilization of energy resources is recognized as a key factor in ensuring the competitiveness of various branches of Russia's economy. Meanwhile, the energy capacity of Russia's economy is much higher than the worldwide average level.

The share of natural gas in the fuel and energy balance of Russia is still at the level of over 50 per cent. At the same time, there is significant potential for growth in domestic gas saving. "Gazprom Group" considers gas saving an important objective and makes efforts to reach it. At present, Gazprom is implementing the corporate Energy Saving Program for 2007 through 2010, which will allow saving in the order of 11 million tons of fuel equivalent. Furthermore, the Law on energy saving and increase in energy efficiency adopted, by the State Duma of the Russian Federation, identifies gas-saving projects as priority measures for achieving greater energy efficiency.

Gas production projects

Major projects for hydrocarbons exploration in Russia are carried out in six (Urals, North-western, Southern, Volga, Siberian the Far East) federal districts. 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 development on 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 had been 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 startup of gas supply via the gas pipeline due 2013, and liquefied natural gas supply- 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 since 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 licenses 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. In order to secure the conveyance of gas from Yamal, a unique, unparalleled in Russia, new-generation gas transportation system 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 and 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 a centralized management, a 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 UK, the Netherlands, France, Denmark and other countries. Nord Stream will link Russia'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 1st line will have a throughput capacity of 27.5 bcm per year. The 2nd 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 anticipated to grow in the nearest decade by nearly 200 bcm, or more than 50 per cent. Due to a direct connection between the world's largest gas reserves located in Russia 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 two 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 gas supply. The network of UGS facilities supplies up to 20 per cent of gas during the heating season and up to 30 per cent of gas during cold snaps to Russian consumers. At present, Gazprom is constructing three UGS facilities in Russia: 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.

Gazprom internationally

Gazprom strives to maintain the dominant position of Russia's gas in regional energy sector of the former soviet states. The company has expanded cooperation with the Central Asia 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 Vietnam (geological exploration work on Block № 112), India (geological exploration work on Block № 26 in the northern part of the Bay of Bengal), Venezuela (geological exploration work within the Rafael Urdaneta project), Libya (geological exploration work in licensed areas № 19 and 64).

USA and Canada

The Government launched radical transformations seeking to develop competition in the USA and Canada. The main principles and conditions of gas market deregulation in these countries are as follows:

- 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 nondiscriminatory 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. 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.

Turkey ^{32 33}

Turkey is among the biggest countries in the UNECE region and as such has a substantial natural gas consumption. The country has used 36,8 bcm of gas in 2007 of which 97% are satisfied through imports, while the remaining 3% are covered by indigenous production. Of the consumed quantities, 20 bcm have been used for power generation, some 8 bcm in the industrial sector, while another 8 bcm have been utilized for residential needs.

Interestingly, Turkey has imported 37,3 bcm of natural gas in 2008. This oversupply is a result from the great number of long-term contracts that country has signed with gas producing countries under the “take or pay” clause. Currently, Turkey is importing natural gas from 6 states: Russian Federation, Iran, Azerbaijan, Turkmenistan, Algeria (LNG) and Nigeria (LNG).

The most significant player on the Turkish natural gas market is the state-owned company BOTAS, which has a dominant position in the areas of gas imports, trade, transmission and storage services. Despite of the fact that 78 % of the wholesale/import sector is legally open to competition, the 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 the company owns the transmission network in the country. Furthermore, the company 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 and underground storage facility in Istanbul.

Unlike the wholesale sector, the retail market (gas distribution) in the Turkey is developing much faster. In 2003 where there were only 6 cities offering natural gas, while in 2009 there are 53 distribution regions have been tendered. 51 of these new distribution companies started their investments in their related distribution zones. The reason for the rapid growth of the gas distribution

³² Turkish natural gas market and legal regulations, paper presented at World Gas Conference 2009 by IGDAS Istanbul

³³ Liberalisation of Turkish natural gas market and progress made in distribution sector of Turkey, paper by Sibel Sayiner presented at World Gas Conference 2009

sector lies with the implementation of a very effective gas distribution promotion scheme by the government.

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

Liberalization

Since Turkey is a candidate for EU membership, the country has developed its natural gas legislature in conformity with the European standards. In that context the Natural Gas Market Law which was enforced in 2001 and the secondary legislation issued by EMRA with regard to this law have been modelled upon the EU Acquis. With these legislative acts serving as the backbone of the liberalization process, the Turkish natural gas sector has undergone a marked reformation in the past seven years including:

- Regulation of the market by requiring separate licence for engagement in any natural gas activity;
- Prevention of 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;
- Establishment of “eligible” consumers (threshold is 1 mcm/year);
- Implementing privatization and stimulating the market development of the natural gas distribution within the country;

Obviously Turkey has achieved a remarkable progress towards the achievement of natural gas market liberalization, especially with regards to the gas distribution sector, where the country’s privatization model has proven to be 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 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. Finally Turkey 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. Finally the two LNG terminals of the country provide further diversification of the sources and the routes of supplies of natural gas.

Turkmenistan

In a meeting in March 2008 with top executives of the fuel and energy sector the President of Turkmenistan Mr. G. Berdimuhamedov defined the current priorities of the country's hydrocarbon sector development. Under these, Turkmenistan is actively supporting three new gas export pipelines. Turkmenistan-China pipeline (30 bcm), Caspian Coastal Pipeline (30 bcm), and 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.

The overall strategy for development of energy resources and their integration 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 of Turkmenistan defined the principles of hydrocarbon export policy. It was stated, that Turkmenistan intends to provide an interdiction for re-export of its natural gas.

According to BP World Energy Statistics (2007) gas reserves of Turkmenistan are around 2.9 tcm. Turkmenistan has picked the British company "Gaffney Cline & Associates" for audit of hydrocarbon reserves in South Yoloton/Osman zone. Along with "DeGolyer and MacNaughton" it has already audited some reserves in central and eastern Turkmenistan in 2004, but their findings were not made public. According to "Gaffney Cline & Associates" report, under the international estimation and classification system, the low estimate of South Yoloton/ 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.

Gas production in Turkmenistan reached in 2008 about 70 bcm. The volume of 20 bcm went to feed an internal demand. The volume of 6 bcm exported to Iran and 44 bcm was sold to Gazprom to supply its markets in Russia and Ukraine.

In April, 2006 during a visit of the former president of Turkmenistan Mr. S. Nijazov to the Peoples Republic of 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 on cooperation in oil and gas onshore and offshore deposits development and the construction of the "Turkmenistan – China" gas pipeline with 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 the development of the "Bagtiyarlyk" gas field, implemented the construction of gas-processing factories and carried out geological prospecting of "South Yolotan/Osman" gas field deposits.

CNPC has 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 bln.

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 expected to start in 2009. RWE would also provide technical training for Turkmen specialists.

In July 2009 Turkmenistan has reached an agreement to boost natural gas sales to Iran by 8 bcm per year to 14 bcm. The countries agreed that 8 bcm of gas will be supplied each year to Iran from the Korpedje deposit in western Turkmenistan, and 6 bcm will come from Dauletabad in the southeast, the country's largest gas field. To supply gas a new pipeline has been build up to the Iranian border, and begins operations in December 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. In this quarter it is presumably around US \$ 175 per tcm. The predictions are that in 2010 Iran would be paying around US \$ 200 per 1000 cm for Turkmen gas.

If US \$ 200 per 1000 cm is the approximate price of Turkmen exports to China and Iran in 2010, it will bring in US \$ 3.8 billion of revenue, enough to cover all the expenses and sustain the national development plan.

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

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

Turkmenistan and Russia 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 Russia will 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 in Turkmenistan, with additional benefit of gasifying some remote settlements. Turkmenistan and Russia will also cooperate in developments of some fields in the Caspian sector of Turkmenistan.

3.2. Gas markets in Balkan countries

The aim of this subchapter is to describe the natural gas markets in the Balkan countries as they are both important and increasingly developing. The focus of the content falls on the status of the gas sector liberalization in these states, as well as on the efforts and strategies of each country to achieve energy security. The overall goal is to assess whether the liberalization process (or the lack of it) impacts the security of gas supplies of the different states and whether it affects the development of the forecoming natural gas infrastructure projects (pipelines, interconnections, LNG terminals and storages) passing through the Balkan region.

For the purpose of picturing most broadly the situation in the region we look at six Balkan countries: Bulgaria, Romania, Serbia, Bosnia and Herzegovina (BiH), the Former Yugoslav Republic of Macedonia (FYROM) and Croatia. Indeed, the states that we examine have been chosen in order to underline the heterogenic nature of the 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*: FYROM, Croatia;
- *Non candidate countries*: Serbia, BiH;

2. *Natural gas production*

- *Significant (50%+ of the local consumption)*: Romania, Croatia;
- *Insignificant*: Bulgaria, Serbia;
- *None*: BiH, FYROM;

3. *Natural gas consumption*

- *Significant (more than 5 bcm)*: Romania;
- *Average (1 to 5 bcm)*: Bulgaria, Serbia, Croatia;
- *Insignificant (less than 1 bcm)*: BiH, FYROM

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

- *Emerging (no or very few consumers, underdeveloped grid, no possibility for competition)*: BiH, FYROM;
- *Developing (few consumers, advanced process of grid development, some readiness for free competition)*: Serbia, Croatia;
- *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 are yet to develop their national gas markets and, thus, are not included in this subchapter.

Bulgaria

Market structure

The Bulgarian natural gas market has advanced a lot in the last years, but still cannot be regarded as fully developed. The demand for natural gas in the country is relatively low - only about 3,4 bcm for 2008. Of these 0,211 bcm have been covered by indigenous production, while the rest of the quantities have been imported from the unique supplier of natural gas to Bulgaria - the Russian Federation.

The use of natural gas accounts for about 16% of the primary energy consumption in Bulgaria. Generally, the natural gas usage in the country is on the rise, as it is being employed more and more in the residential sector, but also in the industry. Nevertheless, currently less than 2% of the households in Bulgaria are gasified, which is far below the average rates for the European Union, which stand between 27%-50%. Furthermore, only about 16% of the municipalities in the country have access to natural gas, compared to 27% to 80% for the rest of 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 in the country from three external suppliers ("Overgas Inc." JSC, OOO "Gazpromexport" and WIEE) on the basis of long-term agreement with the Russian energy company OAO "Gazprom".

The activities of transmission and transit of natural gas on the territory of Bulgaria are executed by the state-owned TSO "Bulgartransgaz" EAD, which also owns and operates the only natural gas underground storage facility in Chiren.

The natural gas distribution in Bulgaria is carried out by 32 gas transmission companies servicing 5 gas distribution regions (Dounav, West, Trakia, Mizia, Dobrudja) and 58 municipalities outside these regions. These companies account for 12.87% of the consumption of natural gas in the country.

The Bulgarian natural gas market is regulated by the State Energy and Water Regulatory Commission (SEWRC). Among other duties, the Commission 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 and up to 50 employees).

Liberalization

As from 01.01.2007 the Republic of Bulgaria is a member of the European Union. In this capacity it is obliged to apply European Law on its territory as part of the country's domestic law. Therefore, Bulgaria has become the addressee of the obligation 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 01.07.2007 all EU member-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, 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 execution 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.

The aforementioned implies that each not 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 larger possibilities to book capacities of the gas pipelines along the gas route by also negotiating more favorable prices for the transmission of its own quantities to the points of sale which match with the consumers' points of consumption.

Yet, while the de jure liberalization of the Bulgarian natural gas market has occurred, in practice the market in the country is hardly liberalized for one main reason related to the application of regulated prices on the market.

Currently, Bulgargaz EAD holds a license for public supply whereunder it is required to sell its own gas at state-regulated (SEWRC) prices only to end suppliers. The end suppliers are under the obligation to sell the gas at these 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 with regard to the end suppliers, but with regard 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 state-owned company applies the regulated price also with regard to the whole quantity of gas which 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 in the country.

Another related problem is the fact SEWRC repeatedly approves for Bulgargaz EAD 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. However, 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

When it comes to satisfying its natural gas needs, Bulgaria relies on gas supplies from Russia through the only pipeline that is connected to the country and which passes through the territories of 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 a potential for maximum extraction of 4,8 million cubic meters 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 the one that 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. Regarding the

latter, Bulgaria is a party to the *South Stream* pipeline project. As for the latter the country participates in the *Nabucco* pipeline project. There are also 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, which is to supply natural gas from Iran and/or Azerbaijan.

Romania^{34 35}

Market structure

Romania is among the few countries in the region with significant indigenous production of natural gas. The country's annual gas consumption for 2008 amounts to 15,7 bcm of which only 30% are satisfied through imports from the Russian Federation through two entry points, Isaccea 2 and Mediesul Auriu.

Currently, there are three trading companies in charge of Romania's 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 satisfying together about 70% of the Romanian gas consumption.

The transportation of natural gas on the territory of Romania is done by "Transgaz" – 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-Ruhrigas), 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% 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 the liberalization process in Romania is similar to that of Bulgaria. As a member 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 July 1st, 2007 has fully opened the natural gas for all consumers, these having the possibility to choose a natural gas supplier from those licensed by the regulatory authority and to negotiate directly the clauses and the prices for natural gas supply.

Despite of the existing legal basis however, there is no real competition in the Romanian gas market. Similarly to Bulgaria, the main reason for the lack of de-facto liberalization of the country's

³⁴ Romania – Internal Market Fact Sheet. January 2007, ec.europa.eu/energy

³⁵ Romania - National report. 2008. -Summary-. 31 July 2009, ANRE

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 of natural gas. This remains an obstacle for the entrance of new companies on the national gas market of the Balkan state.

Security of supplies

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

a) Strategic interconnection of SNT to the neighboring 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 Caspian Sea to the west of Europe).

Serbia³⁶

Market structure

The consumption of natural gas in Serbia for 2008 was 2,43 bcm. Of these, 92 percents are covered by imports from the Russian Federation via only one 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 in the country. It imports the natural gas in Serbia from the only supplier “Yugorosgas” JSC on the basis of long-term contract with OAO “Gazprom”.

What concerns 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. Furthermore, there are some 28 distribution companies with different kind of ownership (private and public) 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 executed by “Yugorosgas” JSC.

The Energy Agency of the Republic of Serbia (AERS) is responsible for regulating the natural gas sector in the country. 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.

³⁶ Electricity and Gas Roamap: Serbia, Energy Community, Ministerial Council Meeting, 17 November 2006, Skopje

Liberalization

The 2004 Energy Law represents the basis for the regulation of the Serbian natural gas market. The law is written in accordance with main principles of EU Gas Directives and 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 TSO to participate in the management of other energy entities performing activities of natural gas distribution and trade.

Despite of 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 the 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 "Yugorosgas" 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 underdeveloped juridical base still represent a major obstacle for the entrance of new players in the gas sector of the Balkan state; at the same time; the restricted access to new sources of gas supply including technical barriers (lack of appropriate infrastructure) also challenges the liberalization process of the Serbian gas sector. These two factors together with the current world economic crisis are pointed as the main reason impeding the development of a real competition on the Serbian gas market.

In order 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;
- The gradual removal of 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

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

Bosnia and Herzegovina³⁷

³⁷ SEE Regional Gasification Study –Bosnia and Herzegovina Market, October 2007, Economic Consulting Associates, Penspen, EIHP

Market structure

The natural gas market in Bosnia and Herzegovina (BiH) is largely undeveloped. The country consumes only about 0,3 bcm of gas per year (310 million cubic meters for 2008), mostly used for household heating, as well as to fuel the two larger industrial customers - the aluminum factory "Birac" in Zvornik and the steel factory "Mittal Steel" in Zenica.

There is no domestic production of natural gas in BiH 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 within BiH: "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%).

Unlike the electricity sector, the natural gas market in BiH 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 in BiH is not liberalized yet: there are no transparent 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 of the country's gas sector.

As a result BiH is currently facing several priorities:

- The adoption of natural gas legislation, in line with the EU Acquis Communautaire and the obligations from the Treaty Establishing the Energy Community;
- The creation of 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);
- The implementation of a privatization program with focus on the privatization of "BH-Gas" in order to create an environment that would attract potential foreign and domestic partner to invest into the natural gas sector.

Security of Supply

While BiH consumes only limited quantities of natural gas the country faces security of supply concerns, which are mainly related to the state of the internal gas distribution system, which 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 main transportation network in the country, which represents an obstacle towards the attainment of both energy security and the liberalization of the natural gas market in the country.

When it comes to securing emergency supplies of natural gas in BiH, 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.

Former Yugoslav Republic of Macedonia³⁸

Market structure

The natural gas sector in the Former Yugoslav Republic of Macedonia (FYROM) is still at the dawn of its development. 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 the consumption of natural gas in FYROM is expected to rise to 0,45 bcm/year.

Since the country does not have its own resources of natural gas it imports the needed quantities of this energy resource from Russia through the territories of Ukraine, Romania and Bulgaria. The juncture point in FYROM 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 capacity 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 appropriate 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, performs the transport services and operates the transport system for the natural gas pipeline in FYROM. “Makpetrol” AD holds a license for trade with natural gas for industrial customers directly connected to the transmission system. There are four other companies that are licensed to trade with natural gas in the country.

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

Currently only one percent of the total energy consumption in FYROM 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 from the region FYROM is a member of the Energy Charter Treaty. As such, it has developed its energy legislation in accordance with the EU Acquis Communautaire.

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. Furthermore the government has adopted several bylaws that regulate specific areas of the natural gas (i.e. regulating prices for transport, distribution and supply with natural gas; establishing tariff system for transport of natural gas; obtaining the status of eligible customers, etc.) These helped reform the natural gas sector in FYROM and allowed for the opening of the national gas market for eligible consumers except households as of 01 January 2008 (with the first qualified consumer of natural gas being “Toplifikacija AD”) and for all consumers until 2015.

³⁸ Natural gas – an energy necessity for Macedonia: Overview of the Macedonian energy potential, Analytica, July 2008 www.analyticamk.org

Despite of the good legislative basis, there have been some practical problems 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 issues in FYROM);
- 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 the development of the country’s gas infrastructure.

Security of supply

Natural gas does not play prominent role in the energy mix of FYROM and the Balkan state uses currently only about 10% of the capacity of its natural gas transmission pipeline. This however is likely to change in the future 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 while striving to cover the requirements for the EU membership, it will need more and more natural gas for both financial and environmental reasons. Thus, FYROM 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.

Croatia^{39 40 41}

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. The county consumes on an annual basis 2,84 bcm (by 2008 estimates) of which it imports 1,26 bcm from the Russian Federation. The natural gas in Croatia is actively used in the residential sector and for power generation, while also being employed in the industry as well as for the production of fertilizers.

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 (44.85%), 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.

The natural gas transmission on the territory of Croatia is performed by “Plinacro” d.o.o. The company is fully owned by the national government and it is the only entity which has a license for transport of natural gas. “Plinacro” was formed in the process of separation of gas transmission division from INA in effort to unbundle the Croatian gas sector.

On the retail market there are currently some 38 distribution/public utility supply companies. The number of companies largely corresponds with the number of different districts for natural gas

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

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 licenses and granting the status of “eligible” consumers.

Liberalization

The legislative framework for natural gas in Croatia is aligned with the EU *acquis communautaire*. 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. There are also a number of bylaws regulating the different tariffs for distribution, supply, storage and transportation of natural gas.

The Gas Market Law is the main legislative act, which 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 August 1, 2007 by the non-residential customers category, and as of August 1, 2008 by the households as well.

Despite of the existing legal basis and similarly to the situation in other countries from 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 a 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 necessities through imports. Nevertheless, taking into account the steady rise of natural gas consumption, the country pursues policy in 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). Furthermore, the country seeks to expand its natural gas underground storage facility to a maximum capacity of 1 bcm (currently 0,5 bcm). Finally, Croatia plans to construct an LNG terminal in the area of Krk Island, which is 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.

3.4. Gas market in the 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 Russia, and around 80% of EU imports of gas from Russia pass via Ukraine. Indeed, imports are expected to increase from about 300 billion cubic

metres (bcm) per year today to around 600 bcm in 2015⁴². 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*⁴³

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 2004/67/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 liberalised, which is why there is a growing need to guarantee the security of gas supplies.

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. The Commission proposed a regulation rather than a directive thus 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 organisations 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

⁴² Commission Staff Working Document SEC(2009) 977 final.

⁴³ European Council of Foreign Relations

should face penalties. While it broadly supports the Commission’s draft regulation, the Committee insists on the need to reconsider gas market liberalisation 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

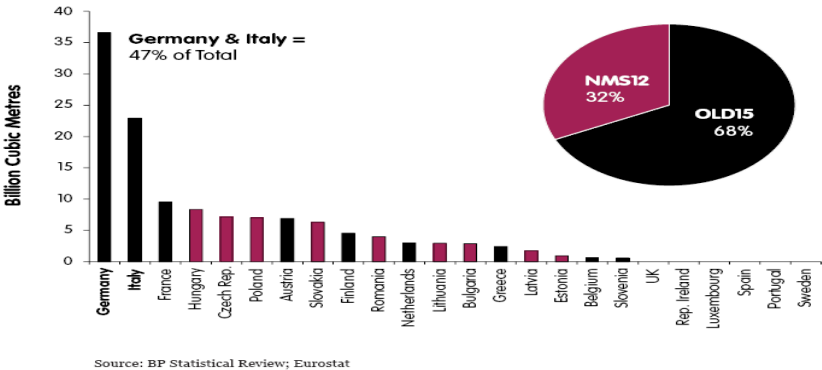
The concept of security of gas supply has two main aspects: long-term and short-term security. The long term security concerns the EU’s ability to ensure a reliable and economic supply of efficient energy and the short-term security means the avoidance of interruptions of contracted gas supply and guarantee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

There are also two inter-related aspects of EU gas security:

1. The dependence of imports

There are important differences between EU Member States. The EU’s eastern national gas markets are, for the most part, small but highly dependent on Russia, whilst the bigger western markets benefit from greater supply diversity. And while the countries that critically depend on Russia 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 11. Gas imports from Russia (2006)

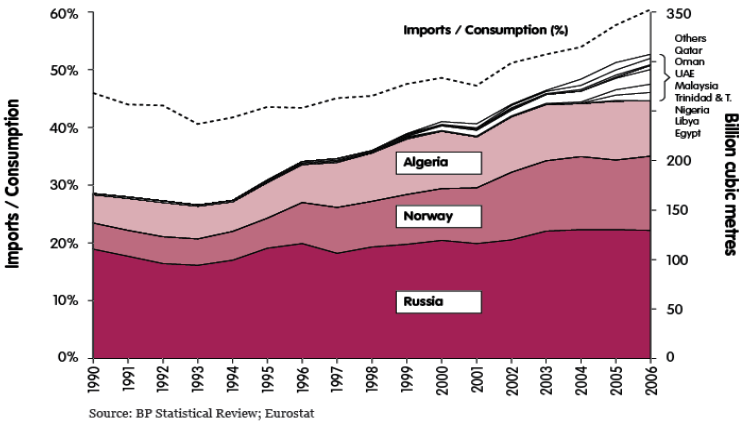


These national differences would not matter too much if there were a single European gas market. But the reality is that Europe’s gas market is segmented along national lines. There is little cross-border trading within the EU, and when supply disruptions occur (such as those during the gas crisis of 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 (Russia, Norway and Algeria) will continue to provide a huge share of European gas imports. At present, almost 10 percent of the EU supplies come from other import sources such as Libya, Egypt, Qatar, Nigeria 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 involved. 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. The national gas incumbents have to deal with the opening of their own national gas markets and the potential threat of competition, so they are expanding geographically and vertically, in order 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, UK, 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 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. At most of gas reserves are located far away from EU markets, it is clear that LNG will play a key role to bring this gas to the market, when distance or natural or political obstacles make pipeline transport impossible. 7.8 percent of the EU external supplies 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 like UK, Italy and Belgium followed them.

The development of gas infrastructure

There are many projects through 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) program. It supports projects aiming at developing natural gas networks and/or ensuring interoperability of natural gas networks within the Community and with those 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 – all with the ultimate goal of achieving market integration and diversification of natural gas sources and supply routes. A project of strategic importance under the TEN-E program is the Nabucco pipeline that 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.

Finally 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 (3 gas pipeline projects) and Azerbaijan (2 gas pipeline projects). This is also seen as contributing to the overall European energy security.

Conclusion

The demand for natural gas within the EU has seen as 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 Union will be increasingly reliant on natural gas imports.

Ensuring the security of gas supplies in such situation will be a challenging endeavor and a one that will require enhanced coordination among the various actors within the EU natural gas sector. In that context, 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, which will contribute to the 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.”⁴⁴

3.5. Security of supply on the 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 from the UNECE region. The starting point of our research was to examine the structure of the gas market that functioned prior the beginning of the liberalization process in the EU in order to see how this system coped with securing the necessary supplies. In that regard 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 limited number of producers/exporters on the basis of long-term contracts, thus allowing for the risk-sharing between the two parties. Such 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

⁴⁴ 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.

passed on the customers. It was precisely the economic inefficiency of the old structure that was in the center of the calls for the liberalization of the natural gas markets.

*Liberalization and security of supplies – theoretical perspective*⁴⁵

From 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 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 surplus of supplies followed by price downfalls. The downstream sector will be covered by a great number of companies such as transporters, shippers, suppliers, distributors, 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. This in turn will stimulate the development of global exchange trading and financial system, which would be able to send price signals allowing for the most efficient allocations of gas supplies and transportation capacity in times of emergency.

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.”

Liberalization and security of supplies – empirical results

Our research has demonstrated that there is hardly a country within the ECE area where the natural gas market has been completely liberalized. Indeed, some of the countries from the region have adopted market liberalization legally, but have not implemented it fully in practice, others have liberalized partially their gas markets, while third have not initiated their natural gas market opening.

There are several reasons for the lack of full liberalization:

1. *The persistence of long-term supply contracts:* This has been pointed by the European Commission as the biggest obstacles for the actual opening of the wholesale gas markets. The fact remains that practically all importing countries from the ECE region have signed long-term gas

⁴⁵ Jonathan Stern, Security of European natural gas supplies, Royal Institute of International Affairs, 2002 p.24-25

supply contracts, most of which date from the period prior to the beginning of liberalization process. The existence of these contracts is reinforced by the “take or pay” clause, which means that the importing states are bound to purchase natural gas from the traditional suppliers, thus, severely limiting the market access for newcomers;

2. *The lack of ownership unbundling:* While legal unbundling between gas trading/distributing and transportation operations has been implemented in most states, few countries have executed ownership unbundling, therefore creating preconditions for a truly independent TPA to the transmission network

3. *The lack of price liberalization:* In some of the examined countries (i.e. Bulgaria, Romania, Croatia) despite of the liberalization process, the natural gas prices even for eligible consumers have remained well below market value, which discourages the entrance of new players on the gas-distribution market;

4. *The strong government involvement and the complicated internal regulations:* These last factors impeding the liberalization process are usually reinforcing each other and are mostly common in the non-EU ECE countries, though also present in some of the de-jure liberalized EU member states. They also limit the entrance of new players on the market.

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

1. *Diversification of suppliers has been impeded:* The fact remains that the current gas market structure in most of the ECE member states has hardly changed from the period prior to the liberalization process with the old incumbents still dominating the sector. The limited market access available to new entrants means in practice that the diversification of gas supplies will be very hard to achieve;

2. *The underdevelopment of crucial gas infrastructure:* The lack of liberalization in countries with still emerging gas sectors has been the reason behind the slow development of critical gas infrastructure. The absence of market opening discourages private companies from the participation in projects aiming the construction of the local gas transportation and distribution networks, but also small scale gas storage facilities. The example of the reverse situation is provided by Turkey. The country has opened completely its gas distribution sector, which has lead to a very fast development of its internal transportation and distribution grid;

3. *Development of long-term security of supply projects:* While the long-term contracts have impeded the natural gas market liberalization, they seem to have favored the development of long-term supply projects such as the North Stream, South Stream and Nabucco pipelines, LNG terminals (Turkey, Croatia) and intersystem connectors. Even if most of these multibillion projects have either not been initiated or are in early stages of development, their realization would not have been possible without the insurance provided by the long-term “take or pay” contracts. These contracts make such expensive projects economically viable, where the producer side is assured of its income, while the suppliers manage to ensure the necessary quantities of natural gas in the long-run.

Although long-term contracts provide economical justification for these costly projects one needs not to omit the role of the governments and the political rationale behind their development. 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, very much like in the times of the traditional gas markets.

Finally, one needs to point out that the gas importing countries from the ECE area will face an increasing competition for natural gas imports from other regions (i.e. China). 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 incentive to the gas producing countries for the development of new resources. Nevertheless, it needs to be recognized that long-term contracts alone may not be sufficient for the development of new gas fields, especially when it comes to unconventional gas, which requires state of art technology for its extraction. Therefore, the producer countries would also have to open their markets for more foreign involvement. 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.

Conclusion

This chapter has revealed that the notions of gas market liberalization and security of supplies do not combine easily. Indeed, as demonstrated, the main obstacle to the gas market opening – the long-term “take or pay” contracts have been and continue to be the backbone of the reliable gas supplies. They will retain this important role in the next decade and probably longer. Nevertheless, liberalization should be pursued especially in the gas distribution sector, where this has proven to produce positive outcomes in regards to the stimulation of the gasification, the development of the local gas distribution infrastructure and in providing greater options to the consumers. Finally, the issue of upstream market liberalization should also be put on the table as it 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.

CHAPTER 4

LIBERALIZATION OF GAS MARKET AND NATURAL GAS SAVING TO REDUCE GAS DEMAND ENHANCING ENERGY SECURITY.

Breaching the theory?

Based on the data collection on the liberalization within the UNECE this chapter examine the link between the liberalization of the gas market and gas saving within the UNECE countries .It will consider whether the level of prices remains an important leverage to promote gas saving among the consumers .This chapter will aim identifying the direct and indirect consequences of the liberalization on the gas saving, on the gas demand, and, by the way, on the energy security, as a whole.

Strictly based on the economic theory, there should be an antagonism between a liberalization of the gas market and consequences on the consumption .Usually when the price of a product is decreasing; there is a trend for increasing the consumption of this product.

On the opposite way, if the price is getting higher, this is a strong incentive for reducing this consumption.

Assessing these consequences should also take into consideration the elasticity of the energy consumption .This elasticity is different considering the different uses of energy. In the transport (quasi- absent for the natural gas , this elasticity does exist ; there is a possible limitation of the use of transport outside of the strictly needed uses ; an important increase of price has , to a certain extend during the first weeks and months , an effect on the consumption ; but this effect will disappear later when the consumers used to consider the price as “normal” . The situation is different with the uses of natural gas ; the multiple applications of this product do not have a lot of flexibility : you need to heat your house or the working premises , depending the external temperature ; the consumption of the natural gas in the industry is mainly depending of the level of economic activity requested by the market ; on the medium and long term the reduction of the consumption is driven by the capacity to develop new technical process in order to save gas.

These policies which require massive investments have already been undertaken in industrialized countries in order to have immediate benefits; these investments have been delayed in other UNECE countries due to the lack of financial capacity to decide and implement these investments.

The investments in the housing sector, a massive post of consumption for the natural gas, are split between the public owners, for a lot of public-owned collective housing, and the private owners for individual housing.

The liberalization of the gas market did not apply in a vacuum situation.

It did intervene, despite similar mindset and principles –free market, competition, transparency - , on very different economic situations, in most of the case of the countries studied, unachieved domestic policies in the field of energy. When the liberalization has been launched in EU, or in other UNECE regions, such as United States of America or Canada, it has been implemented in a coherent process with other aspects of energy policy. The consequences of such a liberalization have to be included in a wider concept of energy reform policies: promotion of energy efficiency, evolution of the energy mix, regulatory framework.

On the opposite way, the liberalization process, in numerous UNECE countries did happen when, at the same time, the other terms of a coherent energy policy, were not yet launched.

The liberalization process, supposed to be implemented on similar economies, has been, in fact, implemented when the level of completion of the economic reform was still containing significant discrepancies.

This study underlines significant differences between the gas tariffs within UNECE.

One could understand easily this difference between countries that have not yet implemented completely the free market rules in the economy, and particularly in the field of energy, but such significant differences remain important between EU countries that have the same level of economic development.

The study has outlined an important difference regarding the situation within the EU / UNECE countries where the liberalization process has been coordinated and integrated and in the other UNECE countries where the liberalization has been principally driven by domestic and national policies.

Furthermore, the study reveals different situations with liberalization, including a total lack of liberalization process, such as the situation in some Central Asian Countries.

Based on the results of the questionnaire, the perception of the consequences of the liberalization covers a wide spectrum within the UNECE: liberalization, completely achieved liberalization, liberalization in advanced process, liberalization in early process, no liberalization at all.

The implementation of the liberalization of the gas market within the EU area countries has been considered through several aspects. They have been mentioned on several occasions in this present rapport. The assessment for the entire UNECE area has been undertaken for the first time, regarding the liberalization of the gas market.

We hope the results of this study and the lessons learned will contribute to accompany domestic policies reforms in the energy field. As outlined in the chapter two of this study, the liberalization of the gas market within the UNECE area has not been, so far, equally implemented. Among the European Union countries, despite the EU directives guiding the governments in the implementation of their energy policies, the implementation of the liberalization wave provides very few similar situations.

While some countries (i.e. The Netherlands) have implemented the EU directives with a very positive result, in terms of real liberalization of the gas market, many EU countries have implemented the part of their energy policy, with a weak result, in terms of competition or incoming of new energy companies.

The thorough analysis of the questionnaire is interesting regarding the gap existing between a strict technical implementation of the EU Directives and some concrete results with a very limited increasing of the internal competition. Similar gaps do exist outside of the EU countries.

The comprehensive analysis conducted through the questionnaires received and suggesting to the national experts an analysis of the implementation of the liberalization provides potential explanation out of the liberalization process:

The main policy guidance for a country implementing the gas liberalization seems driven by the situation of the country in terms of energy dependency or energy independency than strict commitment for sound competition rules.

Reminder for the main principles when the liberalization of the gas market in Europe has been designed as a real economic revolution. This liberalization aimed initially to develop the competition among the energy companies. This liberalization has been progressive: the EU directive in December 1996 on the internal energy market, then the EU directive regarding the internal gas market (June 2003) and the EU directives concerning the electricity and gas internal market; the implementation of the EU directives have been progressive, too, including progressively the transport network (high pressure), and then the distribution network (low pressure).

As a common rule along the EU area, these directives have been translated into internal rules without a uniform implementation.

The present study has particularly considered the national implementation of these EU directives within the EU area.

Most of the EU countries considered in this study do comply with the basic EU directives organizing the liberalization of the energy market, but the situation is far from being similar. Many EU countries do recognize that the implementation of the liberalization of the gas market has not improved the competition among the energy companies; the share of domestic consumers having switched for another gas supplier remain very low (less than a 5 % average rate, due to an insufficient level of information and complicated process for switching).

Nevertheless, it is recognized that the level of prices has been lowered due to the new competition, but this has been partially hidden by the increase of energy prices.

The homogenization of the competition rules has led to similar homogeneity of commercial rules and thus, some of the gas companies have developed their activities towards neighboring countries, acting therefore as new incomers.

The study has revealed much contrasted situation in different parts of the UNECE area.

Despite the common legacy from the former Soviet Union, the situation among the CIS countries is very different from country to country. The split within this region is between energy producers and non energy producers; the role of the transit is most dominant when considering the competition rules; transit countries is an additional argument when a country is already a producer but it does not make a lot of difference if the transit country is an energy consumer country. (such as Belarus, i.e.)

To a certain extent, the liberalization of the gas market among the CIS countries remains to be undertaken, despite some tentative in some countries.

The situation of the Russian Federation has to be considered specifically. For the time being, the price inside Russian Federation (for domestic as for the industrial; consumers remain very low compared to the average export prices. Russian Federation intends to undertake a liberalization process which should lead to an increase of domestic prices, but the management of this process is very sensitive, in order to avoid social unrest (the situation is similar in Ukraine, but this latter country does not have the energy producer assets such as the Russian Federation).

The liberalization: a new rationale energy choice for the consumers?

Selected tools have been used during the liberalization process in the UNECE countries where the implementation of liberalization can be considered having a pro-active effect on the gas consumption .A particular attention has been paid to the pricing policies developed by the gas companies after the liberalization process .Various aspects of the tariffs policy have contributed to pave ways and means developed to generate gas energy saving for the final consumer.

Some specific institutional regulatory framework seems to have been the most favorable to promote energy gas saving.

Based on the results of the present study, the inventory of the selected tools used to manage the liberalization process has been limited.

The EU directives have initiated, among the most industrialized countries, the principles of independent authorities tasked to manage the competition within the energy sector, independently from the state-level authorities.

This trend to set up independent authorities has been duplicated in non EU countries, and particularly in industrialized countries .Nevertheless, it should be mentioned that if the existence of a regulatory commission is a necessity to undertake efficiently a liberalization process, it is a necessary but an insufficient condition.

Many cases underlined in the study the presence of a regulatory commission with the absence of, or insufficient fair and balanced competition rules.

The liberalization process does not seem to have developed the ad hoc tools for informing the potential consumers (particularly the individual ones) during the liberalization process and particularly for making a rationale choice.

It seems that the opposite result has been reached with a very low level of switch, due to insufficient technical and commercial information, and in some cases, dissuasive commercial clauses for switching for another provider, in the future.

The tariffs policy during this liberalization wave has been pro-active when directed towards the customers potentially ready to change their provider .This formula has been used in other network activities –such as telecommunications –when the provider is ready to spend some potential earnings to attract new costumers. In the gas sector, such aggressive policy has been demonstrated towards industrial consumers, much less towards individual ones.

Within some EU countries, particularly, the liberalization wave has concerned both gas and electricity. The result and the increase of the competition were more effective when the liberalization has concerned other energy than the gas, such as the electricity.

Similar demarches for gas and electricity, despite the fact electricity is a secondary source, have strengthened the pertinence of the liberalization process .This has been accrued by the fact that some companies have, under conditions of internal competition rules, dual activities in their portfolio.

The very final result does not seem in the capacity to conclude for a new rationale energy choice for the consumer's .The technical and economical constraints remain very severe for the use

of the energy sources and the level of the investments to be dedicated in the energy sector does not enable a sufficient flexibility.

The only choice which seems to have been offered to consumers is a limited choice for seeking a more economic provider, but here again; the choice seems rather limited for the long term.

Should we conclude that the liberalization process has been ineffective for gas saving? It is premature to conclude this way, for this time being.

Some competition incentives for gas saving? The study has analyzed the competition aspects between the new energy operating companies that could have contributed to reduce the gas consumption. Is there any distinction between the various types of consumers, particularly the industrial ones and the individual ones?

On the basis of the data available through the questionnaire, the study has identified the possible diversion of energy sources towards gas use consecutive to the liberalization of the energy market in the country.

The analysis of the questionnaires may be not comprehensive enough to conclude that the liberalization has a positive effect for seeking possible diversion of gas use consecutively the liberalization process.

But the results available seem to lead to the followings: the competition incentive for gas saving does not seem to be within the upstream part of the gas activity but on to the downstream, meaning the devices for energy use. The policy and commercial preconditions are more able to change the user's mind-set than the reason to keep an energy source or to move towards another one.

Some strong incentives, supported by a state level policy have been developed towards the main energy users, such as cement industry, steel and aluminum industry, who are the biggest energy consumers. The quantities delivered and sold for these consumers are worth to justify from the energy companies the dedicated commercial and networks investments in order to attract for long period these important customers.

A specific role for the state authorities during the liberalization process of gas market?

Was the liberalization accompanied by any ad hoc fiscal incentive in order to stimulate the choice for a specific energy source (gas occurring)? Was this fiscal incentive oriented towards an energy efficiency objective, together with a gas oriented policy?

Should we consider the new environmental constraints as factors impacting the gas demand?

The analysis of the study questionnaires provides analysis for very wide types of situation. The analysis of the gas prices reveals strong discrepancies within the UNECE countries. Numerous countries have still a subsidized energy policy – and particularly for gas, in order to prevent social unrest and to maintain a kind of competitiveness from the national industry.

Several countries, particularly among the CIS countries, have a single operating gas company, which is de facto and de jure a monopolistic company as well as a state owned company.

This situation gives a special role to the state authorities, particularly if this type of situation is similar in other parts of the energy sector. This lead to underline the special situation when lobbying for a liberalization process while the state is controlling most – if not the entire –energy sector.

The study, based on the questionnaire gives a dual role for the state: on one side, lobbying for the liberalization process, whether for EU commitments or whether for fair economic reasons; on the other side, keeping a cautious eye on a sector always considered as a strategic one and contributing greatly in many countries for important share of the public budgets, as an important fiscal revenue.

The analysis of the questionnaire keeps open the real statute of some regulators: independent regulators? Or State regulators?

Have the incomers gas operators attracted by the liberalization increased their capacity of investments and, by the way, have improved the shape of the distribution network?

To which extend these new investments have contributed to reduce the distribution network losses?

Would the extension of the competition reduce the incomes of these new operators, and by the way, jeopardize the security of the market?

This study has analyzed the consequences of these incomers in the confidence to the gas market: Is the gas market perceived as more reliable with additional operators, more transparent? Does this competition have an effect on the contracts prices? Are there any new contract types since the liberalization process?

Can we identify, after this wave of liberalization, a sustainable trend for a vertical integration among the operators? To what extend is it a contribution for strengthening energy security? Is it a cross border trend within the UNECE area?

The present study underlines the importance, when assessing the consequences of the gas liberalization, of investments in the entire chain of the gas industry: network, storage, LNG terminals, and low pressure distribution networks.

We do consider as a very positive result of the gas liberalization the added value brought by the present or news incomers .The unbundling process, principle which has been developed in most of the EU countries, or still in the process to be developed, has promoted new roles for additional companies and has increased the needs for new investments .These additional investments have strengthened the gas chain and have contributed to increase the energy security in the concerned area.

Conclusions and recommendations

Considering the expected increase of gas demand driven by the power generation for the next years, the effects of the liberalization of the gas market should be analyzed regarding the potential change of behavior of industrial and individual consumers. A particular attention will be given to the fiscal energy policy since the liberalization policy.

What are the lessons learned after the first waves of liberalization for the countries that are not yet engaged in this process?

As outlined through the results of the present study conducted among the UNECE countries, the liberalization of the gas market has provoked important consequences within the EU countries...The liberalization has deeply changed the legal and economic framework of the gas industry in most of the EU countries .This trend has been developed within this economic area in

other energy activities such as electricity .This liberalization model has been partially duplicated in other countries .Does it mean that this model is successful?

The answer has to be mitigated: if the gas liberalization has been implemented, many economic situations in the gas sector moved from a monopolistic situation towards an oligopolistic one. In some cases, the situation remains unchanged and the questionnaire underlines the lack of real competition, despite the liberalization .In some rare cases, the situation is even opposite when the liberalization has strengthened the monopolistic situation.

But the overview should provide a more in-depth analysis, when assessing that the gas liberalization has been a decisive step for breaking down a situation in the energy sector without any competition. On the other side, one should keep in mind the specific situation of the energy industry and of particularly of the gas industry: huge investments needed, dual networks (high pressure and low pressure), and gas storage capacities to develop in order to overcome potential disruptions.

The study has been partially ignoring the aspect of the LNG development which will change deeply the gas economy in the near future .In this respect, it seems to us that the gas liberalization has “wrapped up “the economic face of the gas industry provoking therefore a real assessment of the gas cost for the traditional gas market while the LNG market was emerging.

The results of the questionnaire available keep pending some question marks: are such important discrepancies in the gas price sustainable in the very future? Should we imagine, after the first wave of liberalization, a second wave of liberalization, pleading for a wide energy market? Could we wish -and imagine- the principles of unbundling within a wide gas market, including the transport network over the trans-boundaries lines?

Should we consider, as part of the implementation of the liberalization process the Third Party Access to be eligible to the international gas network?

CHAPTER 5

THE ROLE OF LNG IN THE PROCESS OF GAS MARKETS LIBERALIZATION IN THE UNECE REGION

At present, LNG is a most dynamically developing energy carrier in the world. In the total world gas trade, the share of LNG equals to 27% and is forecasted to reach about 60% of the total volume by 2030, corresponding to 18-20% of the total volume of natural gas consumption on Earth.

This forecast stems from increased efficiency of natural gas liquefaction and continuous decrease of the liquidation process cost, on one hand, and high flexibility of LNG supply chains, allowing a successful variation of servicing multiple markets, on the other.

According to many experts, LNG is already now becoming a part of the global world market. LNG is used for the same purposes as the net natural gas: generation of electricity, heat energy and industrial cold, provision of communities and industrial facilities with gas, creation of fuel backup to address peak loads (the so-called "peak-shaving"), application as motor fuel for transport means, and as a raw material for the chemical industry. Wide application of LNG in the world markets is, first of all, associated with its prices comparable to or cheaper than the prices of liquid hydrocarbon fuels, LNG being a cleaner type of fuel.

Last year the LNG world trade volume equaled to 162M tons (242.8B m³). The share of the country-members of UNECE is about 53.5M tons while the major part of LNG (about 60%) is sent to the East Asian countries.

Expensive gas liquefaction technologies are continuously improved and become cheaper. For instance, since mid 1990s up till now, the liquefaction process costs fell down by 40% approximately and by 2015, according to specialists' estimates, it will lose another 10% and will continue becoming cheaper further on.

Capital costs on construction of LNG plants at the end of the 1970s amounted to 2 thousand USD per ton of capacity, while now such costs are 500 USD (in both cases the price is given in USD of 2002). At the same time, the construction and maintenance of material-intensive gas pipeline systems, according to the forecasts, on the contrary, will be becoming more and more expensive.

Furthermore, LNG suppliers benefit from overseas transportation saving. If the conditions are favorable, the price of gas supply by a tanker may be lower than the price of gas supply via a gas pipeline almost by an order. Therefore, LNG-technologies are more cost-efficient already today when gas is transported at a distance above 2.5–3 thousand km. As a result, for example, in West Europe the prices on LNG and net gas became equal already in the beginning of the 2000s.

The evolved liberalization processes of natural gas national markets facilitate diversification of supplies and improvement of competition.

The market liberalization concept provides for increase of its openness level, access to user for non-monopolistic structures, optimization of gas prices on this basis. In the course of liberalization, the import restrictions are gradually lifted, also the internal barriers are taken care of in order to ensure inflow into the market of the necessary quantity of gas at the best price.

Natural gas prices are determined by bilateral contracts between its suppliers and users, largely concluded based on the world oil prices. But this situation may substantially change in connection with heavy growth of the liquefied natural gas output.

Today LNG can compete in price on par with oil and pipeline gas supplied to the most promising markets. One of the reasons for appearance and efficient development of the LNG world market is the lower commercial effectiveness of the pipeline transport and arising technical and technological problems of gas mains.

The hopes of the consuming countries for further diversification of the sources of supply are connected with expansion of the LNG supply volumes and the growth of its role in the world gas trade from auxiliary to predominant. This has been clearly demonstrated in the course of the first stage of the EU gas market liberalization process.

In liberalization environment, there is a tendency towards shorter contract terms and non-inclusion in them of the 'take and pay' condition, which has led to active application of more flexible contract forms and spot gas market development. Shorter contract terms result in higher instability of cash flows of the main gas suppliers to the regions. In spite of the tendency towards a greater share of the open market because of its liberalization and growth of the LNG share in its commodity composition, the transition to it will be possible only when the share of long-term contracts in the international gas trade turnover falls down to a level lower than 50%.

At the middle of the first decade of 21st Century, new price signals given by the gas markets encouraged to decide going ahead with the construction of many LNG producing plants and receiving terminal planned, but waiting on the shelves, in the world. Progress made in LNG technologies, in particular relating to the size of the producing trains and ships leading to important economy of scale comforted those decisions. For instance, each of the 6 new LNG trains of Qatar which are being commissioned since 2008, has a capacity of 7,8 Mt/a (ca more than 10 bcm/a), and the new Qatari LNG ships (Q-Max), with 260 000 cm, are twice as big as the previous standards.

With a growing share in the international natural gas trade approaching 30% in the very next coming years, LNG has become the major factor of linkage between the 3 main market areas - Asia, Europe and America. Stronger in the then Seller market, producers/sellers developed downstream strategies beyond shipping, in buying capacity shares – sometimes ownership – in LNG terminals, along with a marketing strategy through new type of contracts allowing them to divert with short notice cargoes from one destination to another more valuable. The term "arbitrage" has become the King.

Gradually, in order to secure their supply, Buyers must be prepared buying spot the most expensive LNG currently available in the world, but can equally bet taking profit in case of surplus situation in the offer/demand balance. Many initiatives were seen to building new LNG terminals in importing areas. However, the economical recession prevailing since 2008 in western countries along with the putting in production of the new LNG producing plants, and the "unexpected" shale gas production in USA, created a glut which is probably to last some years

All regions are not facing this situation in the same manner:

USA have become quite self sufficient in gas due to shale gas production, leaving idle ca 100 bcm/a LNG re-gasification capacity already built; moreover, adapting to the new situation, the construction of a liquefaction plant of LNG 8 to 16 Mt/a is under study on the site of an existing terminal in order to export LNG at price conditions linked to Henry Hub quotations.

Inter-arias arbitrage decisions are favourable to Asia as countries like China, Korea and even India are paying a price nearing equivalence to oil price on energetic value, and along with Japan and Taiwan, attract most of the LNG available. Several diversions of LNG cargoes to Asia are

reported made by European companies, as a consequence of gas market globalization sustained by liberalization policy.

This new context helped the process of gas and energy markets liberalization going on in Europe since 2000. As gas pipe imports are dominant in European supplies, competition Authorities have welcomed the construction of several LNG receiving terminals in order to get more credibility to their policy, in showing gas from new origin supply the market at much lower prices than the traditional long term contracts indexed on oil. Indeed, these new installations have been paving the way for new comers' entering into the European gas market and developing alternative strategies of supply in competition with incumbents.

Countries which have been the most affected by LNG development are UK, Belgium, France, and Spain, as well as, but to a lower extent, Italy. Other countries of the region, such as Greece, Portugal and Turkey, despite existing terminal(s) on their territory, have been smoothly impacted for local reasons. Lastly, a new terminal is under construction in The Netherlands, and many are planned in several others countries but still need final decision. It is worth to mention that, had the economical crisis appeared later, several terminals would have been under construction currently.

In the framework of new market organization, LNG terminals have been unbundled alike other infrastructures; they are placed under an open access and non discriminatory regime, on the basis of regulated tariffs. However, in order to encourage new buildings, EU Commission granted several projects with exclusive rights which helped investors or capacity subscribers to make a favourable decision.

UK followed such a strategy, and finally, starting with almost to nothing LNG re-gasification capacity a few years ago, currently can receive 40 bcm/a, representing ca 45 % of its yearly gas needs. LNG supplies contributed surely to maintain the gas market liberalized. Had these capacities not been constructed, building new gas pipes would have been necessary from the continent, changing drastically the situation, towards less competition in the market.

Another remarkable site is Zeebrugge, located on the Belgium Nord Sea coast, which presents the specificity of being at the cross road of an LNG terminal, the off shore Zeepipe coming from Norway, and the Interconnector linking Belgium to UK. The total capacity traded or flowing through there is nearing 50 bcm/a, that is ca 10 % of the current EU gas consumption. Not surprisingly, the first continental market place was organized there, and traded volumes are increasing continuously. Relating prices are in harmony with NBP prices except if and when Interconnector presents situations like maintenance. Influence of LNG can be seen directly with deliveries in the Zeebrugge terminal, but also via UK terminals through the Interconnector.

European gas market liberalization is pushed forward along with a continuous development of the capacities of cross border pipelines. For this reason, and also because of LNG deliveries in other terminals like Montoir-de-Bretagne in France, the other European hubs or market places, show prices in harmony with Zeebrugge, albeit not fixing exactly at the same level or changing instantaneously in the same manner.

Finally, the case of Spain is also very interesting to study, because quite 2/3 of its gas supplies are made of LNG arriving in the 6 existing terminals of the country, while others are under construction. Due to difficulties in laying pipes through Pyrenees Mountains, Spanish gas network stands quite aside the European gas system by the lack of a strong capacity interconnector with France. However, new construction should be decided within very short time. One can't imagine that

without liberalization, the current situation could have been created in Spain, and reciprocally, LNG, because of diversity of its origins, supported also liberalization.

In conclusion, a historical time conjunction was seized by the abundant availability of LNG quantities on the global gas market on one hand, and by the liberalization process going on in European countries on the other, to helping mutually in their respective growth. No doubt that LNG development supported liberalization process and reciprocally.

CONCLUSIONS

Liberalization works, but a lot needs to be done

The path of liberalization which many countries of the UNECE have chosen over the past decades is 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. It has been clear that this process is neither simple nor fast. Historic and vested interests and the structure of the supply side create sometimes limitations which take time and perseverance to overcome. A certain amount of market oversight and regulation, in particular where the market is still developing can therefore be necessary. On the other hand regulation should be kept to a minimum when markets already do function properly. This report shows that liberalization has the potential to create a gas market that is affordable, sustainable and secure but it will be very difficult to balance these three interests.

The market can deliver new investments

The US wholesale market is widely recognized as an example of a liberalized market (at the wholesale level), with prices normally reflecting supply and demand fundamentals. Although the oil price often functions as a kind of ceiling for the gas price, gas-to-gas competition can at moments of oversupply drive the price away from the oil price, in general to the benefit of the consumer. Price signals should also be the driver for investments. This mechanism in itself works relatively fine as demonstrated 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 as soon as prices were falling in 2009. The system inherently has a danger of creating boom and bust cycles as investments need time to materialize, however it is up to the market to take and appraise this risk. Opening up a market for competition necessarily implies that all competitors should have access to the market, which sometimes means that there is more infrastructure than there would have been in a monopolistic structure. The consumer will not notice this as the gas price will still be lower due to increased competition, the new supplier earns back his investment due to an increased demand for his services.

Long term contracts are compatible with the liberalization process

The market is a tool to deliver security of supply and demand objectives and flexibility. Within the gas market there are opportunities to value security of supply and demand, and to assign responsibilities to parties best placed to manage it. It is increasingly realized that even the more-developed liberalized markets may not provide all the investment signals required for a timely response by investors or valuing security-of-supply. Unless policy makers design markets which value security, this may tend to be under delivered, noting that long term contracting of supply and vertical-integration provide (or are assumed to provide) this in many cases. For example Russian Gazprom believes that the basic architecture should be comprised of long-term agreements for the supply of the blue fuel and several European importers are committed to their long-term agreements with Gazprom

A level playing field is an important prerequisite 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 TPA, and there will have to be greater physical access between individual countries' gas grids. Attitudes to liberalization, however, may be about to change in some countries as gas production falls and imports rise. Energy market

liberalization in the EU has been a difficult process and is likely to remain so. While some countries, notably the UK, have gone full steam ahead into creating fully competitive markets within their own borders, other countries have concentrated on developing “national champions” that will be able to compete in the expected Europe-wide energy marketplace. It is important that regulators ensure a level playing field for all participants in the market.

Liberalization is just part of the overall energy policy

In Europe it is most visible that liberalization is not the only policy driver for governments. Alongside the Third Energy Package, which is now being transposed into national legislation, a Climate & Energy package has been agreed and a new Security of Gas Supply Directive has been proposed. We now witness that it is difficult to balance the interests in such a dynamic policy environment. Ideally these pieces of legislation should reinforce each other and not lead to clashes or paralysis and this is not impossible, it is merely a matter of keeping the overarching objectives of energy policy in mind when addressing its individual components.

Gas is an integral part of the sustainable solution

The role of gas in the energy mix is important for meeting the energy policy objectives of security, competitiveness and environmental sustainability. First of all, when gas is used, it should be used as efficiently as possible. A liberalized market can provide clear price signals that show the real economic value of the molecules. On the other hand, subsidies can distort this transparency and lead to losses which are not necessary. Secondly, gas is not only the cleanest fossil fuel, but also the most flexible. Natural gas can provide the flexibility which wind and solar energy need as a back up. Thirdly green gas (from short cycle biological origin) can in the future to a certain extent replace carbon rich fuels. This way gas is a bridge to a sustainable society, but also an integral part of this sustainable future.

Liberalization can help developing gas markets

The Western Balkans are strategically located between hydrocarbon-rich regions (including Russia, 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, both for the region itself and for Europe as a whole. At present, gas markets in the Western Balkans are small or non-existent but have potential for strong growth. Reliable and affordable energy supply is crucial for economic development and social welfare across the Western Balkan region. In the case of natural gas, a well-functioning market – both in the Western Balkans and in Europe – depends on securing adequate supply and on promoting the enhanced reliability and market performance that can be offered by diversified sources of supply. All the energy markets require significant domestic and foreign investment to refurbish existing infrastructure and to build new energy facilities for production, generation, transmission and distribution. At the moment the region is for the largest part committed to the liberalization process through the Energy Community. Actual implementation can be improved, but it is clear that an open, transparent market, with good public administration proper market institutions can help the region to become a flourishing gas hub.

Non liberalized regions have their own challenges

The CIS region of the UNECE is not aiming at a full liberalization yet. Nevertheless Russia is experimenting with several domestic market reforms. The challenge for the countries which rely on strict government regulation lies in keeping the system efficient. Countries with large reserves tend to keep prices for consumers low, to stimulate the domestic economy. This goes at the expense of a

stimulus for energy efficiency. Countries which are net importers experience even bigger problems. Their import prices are often determined by market forces, yet they are not able to pass the fluctuating costs on to the final consumers. This leads both to inefficiencies and heavy cross subsidizing.

Many ways are leading to Rome

Coming from the country- and region-based analysis of the impact of liberalization on the natural gas markets to the insight into the situation with the whole UNECE region, it is worth to be concluded that liberalization is rather a process than the strict set of rules that each country has to follow. More to say - it is the natural evolutionary process of the energy markets' development, meaning that a country or a region has to come through the preparatory stage and get ready for the changes in the gas sphere. Depending on many conditions: global ones such as the level of economic development, geographical location and total involvement of a country or a region into global trends with the cross-border energy trade in particular, and the local ones such as different business attitudes, corporative culture, goals of the energy business elite, - the process of liberalization will have diverse effects within a country or a region.

It has become a set of rules embodied into the regulatory frameworks in certain regions of the UNECE area and at the same time it is the atmosphere where other UNECE regions are developing given that the liberalization implications come to many countries externally. Though the most effective way that leads to efficient reforms is the way when changes come from the inside and not the opposite as there has to be a solid ground for the attitudes toward liberalization to come and stay firm.

ANNEX 1

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	NO	YES	NO
Estonia	2007-07	YES	NO	NO	NO
France	2007-07	YES	YES	YES	YES
Germany	1998	NO	NO	NO	NO
Greece	2009- 2030	Closed Market	Closed Market	Closed Market	Closed Market
Hungary	2007-07	YES	NO	NO	NO
Ireland	2007-07	YES	NO	YES	NO
Italy	2003-01	YES	NO	NO	NO
Latvia	2010-01	Closed Market	Closed Market	Closed Market	Closed Market
Lithuania	2007-07	YES	NO	NO	NO
Luxembourg	2007-07	NO	NO	NO	NO
Netherlands	2004-07	YES	NO	NO	NO
Poland	2007-07	YES	NO	NO	NO
Portugal	2010-01	Closed Market	YES	YES	YES
Romania	2008-07	YES	NO	NO	NO
Slovak Republic	2007-07	YES	NO	NO	NO
Slovenia	2007-07	NO	NO	NO	NO
Spain	2003-01	YES	NO	NO	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