Energy Community

Study on the Improvement of Interconnection, Interoperability, Transparency and Harmonisation of Operational Rules for Natural Gas Transportation in the Energy Community
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>Bcm</td>
<td>Billion cubic metres</td>
</tr>
<tr>
<td>BiH</td>
<td>Bosnia and Herzegovina</td>
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<tr>
<td>CAP</td>
<td>Capacity Allocation Mechanism</td>
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<tr>
<td>CM</td>
<td>Congestion Management</td>
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<td>CP</td>
<td>Contracting Party</td>
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<td>Energy Community Ring</td>
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<td>Energy Community Treaty</td>
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<tr>
<td>FBiH</td>
<td>Federation of Bosnia and Herzegovina</td>
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<td>GIE</td>
<td>Gas Infrastructure Europe</td>
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<td>IAP</td>
<td>Ionian-Adriatic Pipeline</td>
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<td>LOI</td>
<td>Level of Implementation</td>
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<tr>
<td>Mcm</td>
<td>Million cubic metres</td>
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<tr>
<td>MEURO</td>
<td>Million Euro</td>
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<tr>
<td>MNm³/h</td>
<td>Million standard cubic meters per hour</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>MUSD</td>
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<td>NA</td>
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<td>Security of Supply</td>
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<td>Total Primary Energy Supply</td>
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<td>Transmission System Operator</td>
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EXECUTIVE SUMMARY

Introduction

Energy Markets Partners LLP (EMP), with the co-operation of LDK Consultants, has been engaged by the Energy Community to undertake a Study on Improvement of interconnection, interoperability, transparency and harmonisation of operational rules for natural gas transportation in the Energy Community. The Contracting Parties, as members of the Energy Community, for this study are Albania, Bosnia & Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Serbia and UNMIK. This final report identifies any operational obstacles including technical difficulties to the improvement of interconnection, interoperability, transparency and effectiveness of natural gas transmission in the Energy Community, with a view to improved gas trade and network utilization.

The Terms of Reference covered a number of areas including operational developments, capacity considerations and balancing regimes. In detail these included:

- Investigate the operational developments of gas transmission under Third Party Access in Contracting Parties and the EU Member States with which they are interconnected, with a view to:
  - identifying the necessary steps for the full integration and interoperability between neighbouring Contracting Partners and EU Member States;
  - promoting good practice in gas transmission and compliance with Regulation on Conditions for Access to the Gas Transmission Networks, Regulation 1775;
  - promoting good practice in gas balancing taking into account the relevant ERGEG guidelines;
  - promoting the eventual adoption of Common Business Practices defined by EASEE-gas;
  - adopting transparent capacity calculation methodologies and their publication, taking into account the relevant ERGEG Guidelines;
  - illustrating the necessary methodological improvements to the personnel of transmission system operators and regulatory authorities;
  - identifying the main related requirements including network enhancements, metering and other equipment, software, and the necessary personnel training.

- Analyzing current capacity availability as well as allocation and congestion management methodologies, starting from results of the 2007 Gas Survey, with a view to:
  - Describing existing capacity allocation methods;
  - Ascertaining to what extent reduced pipeline use is due to lack of demand, capacity reservation by long term contracts, or other causes including upstream difficulties;
  - Diversified supplies and increased market liquidity;
  - Suggesting remedies aimed at improving existing capacity and its use in the short and medium term;
• Suggesting new methodologies for capacity allocation and congestion management to be included in the new market rules;
• Proposing criteria for harmonisation of the market rules in the Contracting Parties.

• Analyzing current methods used for balancing transmission networks including resort to storage facilities, with a view to improve the viability of the network and facilitate trading and entry of new suppliers:
  
  • Examine possible alternatives and any difficulties to implement them;
  • Propose a roadmap towards more advanced and market-oriented balancing regimes, also considering the ERGEG Guidelines on storage and flexibility services.

EMP has prepared and submitted an interim report and a preliminary report to the ECS (ECRB Section) and has also visited and held meetings with the TSOs and regulatory authorities where Contracting Parties have existing gas transmission networks.

This Draft Final Report covers the whole study, including the information contained in the interim report, updated for the visits and meetings, and the initial conclusions and proposals, divided into operational developments, capacity considerations and balancing regimes, based on information gathered and the site visits. Following review and comment by the ECRB Gas Working Group and the Project Steering Committee the consultant will submit the Final Report to the ECS.

It was noted in the Terms of Reference that “the final report will also suggest, for each Contracting Party, the main remedial actions that are necessary to remove such obstacles, and suggestions for the harmonization of technical market rules, aimed at increasing market integration and liquidity. Proposed solutions will be based on those adopted in the European Union and consider, as far as feasible, the best practices of the EU Member States”.

The EU Directives, guidelines, regulations and also the ERGEG and EASEE-gas codes and common business practices are largely focused on the large complex gas transmission systems found in the larger EU Member States such as the UK, Germany, France, Italy, Netherlands and Spain. The transmission systems in the Contracting Parties are much smaller, relatively simple systems which do not necessarily require a lot of detailed complex rules. While it is important that the Contracting Parties follow the broad principles of the various directives, regulations and guidelines, any proposals and recommendations need to be appropriate for the respective transmission systems.
Conclusions

The conclusions follow the terms of reference and are divided into operational developments, capacity considerations and balancing regimes.

Necessary Steps for Full Integration and Interoperability

Interconnections within the area are currently limited, normally to one per Contracting Party. As a consequence the prospects for full integration and interoperability are limited. As a first step, however, it is recommended that detailed Interconnection Agreements (IAs), between TSOs, at all the interconnection points – both between Contracting Parties and EU Member States – be put in place, using the EASEE-gas Common Business Practice (2005-002/01). A “Balancing Shipper” type of IA will probably be adequate as a first step.

Promoting Good Practice in Gas Transmission and Compliance with Regulation 1775

The main topics addressed by Regulation 1775 should generally be covered in the Network Code of the TSO. Network Codes are being developed by most TSOs in the Contracting Parties. Currently, there is only one shipper on all the TSOs’ systems. In each case the single shipper is the incumbent gas supply company, and in the case of BH Gas the company has not been unbundled yet. As a consequence it is unlikely that the new Codes will be tested to any great extent in the foreseeable future. In respect of tariffs, currently all the TSOs use a postage stamp transmission tariff, where there is one, which would enhance harmonization between the Contracting Parties.

Promoting Good Practice in Gas Balancing

The main thrust of the ERGEG guidelines, as they relate to cross border trade, is that TSOs should endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate gas trade as already required by Regulation 1775. No balancing rules currently exist in the Contracting Parties, although they are being developed as part of the draft Network Codes in Croatia, Serbia and FYR of Macedonia. Balancing is currently seen as a technical, operational issue.

Promoting the Eventual Adoption of EASEE-gas CBPs

The EASEE-gas Common Business Practices (CBPs) largely cover issues such as information provision and exchange in addition to the many issues that would be covered in an Interconnection Agreement. The implementation of harmonised detailed Interconnection Agreements between TSOs would go a long way towards ensuring that the CBPs were adopted.

Adopting Transparent Capacity Calculation Methodologies

On 15 June 2007 ERGEG launched a public consultation on Calculation of Available Capacities. ERGEG sought views on ways for greater transparency, greater consistency and optimisation of available capacity calculation throughout the EU’s gas transmission networks. As a consequence of the public consultation ERGEG are developing a GGP on capacity calculation. In Croatia and Serbia, work is in hand on the methodology of calculating capacity and the publication of information on available capacity.

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1 Understanding and Issues – An ERGEG Public Consultation Paper C06-CAP-06-03
Necessary Methodological Improvements to Personnel

In the past training had largely been on technical matters and the TSOs were mostly staffed by engineers. It was generally felt by the Contracting Parties that both TSOs and regulatory authorities would benefit from training and assistance on regulatory and commercial operations in the new gas industry environment. It was emphasised, however, that such training needed to be specific to the circumstances of the Contracting Party and very general training would not necessarily be beneficial. Ongoing assistance in commercial operational matters would also be helpful.

Network Enhancements, Metering and Other Equipment

Investment in metering and control equipment is ongoing in the Contracting Parties:

- In Bosnia and Herzegovina metering is done on a daily basis and BH Gas has partial SCADA system.

- In Croatia metering of entry and exit points is available on an hourly basis and there is a project in place for remote reading. A SCADA system has also been installed.

- In FYR of Macedonia the metering system at the border has been installed recently and gas quality is monitored regularly. However, improvement of downstream metering is necessary, which will help in the appropriate determination of system losses.

- In Serbia a project for a new SCADA system is being outlined, while a programme to install dataloggers is in hand and should be mostly completed by end 2010.

Existing Capacity Allocation Methods

All the Contracting Party TSOs currently are single shipper systems and in Bosnia and Herzegovina unbundling has yet to take place. As noted above Network Codes are being drafted to provide TPA services and it is anticipated that capacity allocation mechanisms will be incorporated in the Codes. Congestion management has been identified as an open issue in the draft Network Code for Serbia.

Issues of Reduced Pipeline Use

The situation in respect of the use of pipeline capacity differs from TSO to TSO:

- In Bosnia and Herzegovina the internal system has capacity issues at peak but that is in part due to upstream constraints.

- In Croatia capacity on the internal system is more than sufficient to meet existing demand and can be increased by use of compression. However at Rogatec – the Slovenian entry point – technical capacity is unclear. The capacity given is the contractual amount but technical capacity may be higher (provided adequate delivery pressure).

- In FYR of Macedonia capacity on the internal system is more than sufficient to meet existing demand. However on some occasions during peak gas usage in Greece during winter, pressure falls but this problem will be fixed shortly through the utilisation of the 2nd compressor station in Bulgaria.

- In Serbia capacity on the internal system will be more than sufficient to meet existing demand, when the new storage facility starts up (5 Mcm/day deliverability).
Capacity utilisation at the Serbian-Hungary border point is only just over 50%, but there are potential upstream capacity constraints in Ukraine. A simple TSO to TSO agreement is in place for meter readings.

Diversified Supplies

The Contracting Parties have a number of plans to diversify supply and transport capacity: Apart from the possible LNG terminal on the Croatian coast, plus any additional connection to Italy, the main route to diversify supplies would be effectively from the south east through Turkey and/or Greece.

Improving Existing Capacity Use

Apart from some peak capacity issues in Bosnia and Herzegovina, existing capacity on the internal transmission systems is largely underutilised. Projects to increase gas demand in the Contracting Parties could be accommodated to increase utilisation of existing capacity, with additional compression and storage projects in Serbia and Bosnia and Herzegovina, in particular, providing the required peak capability. However, any significant increase in demand would require the alleviation of upstream constraints and/or the diversification of gas supply and transportation capacity.

New Methodologies for Capacity Allocation and Congestion Management

All the Contracting Party TSOs currently are single shipper systems and in Bosnia and Herzegovina unbundling has yet to take place. As noted above Network Codes are being drafted to provide TPA services and it is anticipated that capacity allocation mechanisms will be incorporated in the Codes.

Harmonisation of Market Rules

Since market rules have yet to be defined, progress on harmonisation can proceed at the same time as the drafting of the rules. Proposals on the scope of such harmonisation are provided below.

Alternatives for Balancing Transmission Networks

The Contracting Parties are each confronted with differing circumstances but apart from Croatia, which has storage, linepack and interruption are the main tools. The issues associated with commercial balancing have not yet been addressed by the Contracting Parties, although they should be in the Network Codes that are being drafted.

Roadmap towards more Advanced and Market-Oriented Balancing Regimes

In view of the fact that commercial balancing regimes have yet to begin being developed, and that competitive, liberalised markets are some way off, it is premature to begin discussion of market-oriented balancing regimes. The key principles are covered in the Guidelines for Good Practice for Gas Balancing which could be incorporated as part of the relevant Interconnection Agreements between TSOs. In the more advanced balancing systems, shipper imbalances can be “cashed out”, maybe on a daily basis, if a liquid market for gas exists. However, in the absence of a liquid market and/or a balancing price that is seen as being independently determined i.e. not by the shippers or the TSOs, then a physical “make-up” balancing regime is likely to be a better initial option.
General Conclusions

- There are no TSO to TSO Interconnection Agreements (IAs) at the respective transfer points in any of the Contracting Parties. Common IAs based on the EASEE-gas common business practices should be put in place at all the current (5) transfer points.
- Network Codes are currently being developed in all the Contracting Parties, apart from BH Gas in the Federation of Bosnia and Herzegovina, although no drafts have been seen, other than the one provided by FYR of Macedonia. It is not possible, therefore, to assess if they conform to Regulation 1775, guidelines on balancing etc and to what extent they are harmonized with neighbouring TSOs.
- Upstream capacity constraints in Hungary and Ukraine were identified as issues in a number of the Contracting Parties and these are likely to limit market development. The diversification of both gas supply and transportation, away from traditional sources via Ukraine is an urgent requirement, particularly from a security of supply perspective. It is reported that these upstream capacity constraints are in the process of being resolved but it remains to be seen the extent to which this will be achieved.
- In the context of the need to diversify, the planning and coordination of investment requirements and upstream capacity and supplies would benefit Bosnia and Herzegovina, Croatia and Serbia immediately and FYR of Macedonia ultimately.
- The lack of knowledge and expertise in the commercial and regulatory implications of the changing gas market environment was identified by most TSOs and regulatory authorities. Specific assistance and training, tailored to the needs of the Contracting Parties, would benefit all the TSOs and regulatory authorities.
- In Serbia the TSO identified open issues with the draft network code in the areas of congestion management, balancing charges and tolerances and the separation of responsibilities between the TSO and shippers.
- In FYR of Macedonia, the remoteness from other Contracting Parties is an issue and the prospect of diversification of supplies and transportation may be longer term than for other Contracting Parties, although separate interconnections with EU member states are possible.
- In Bosnia and Herzegovina, there is a complex structure with 3 TSOs – BH Gas, Sarajevo Gas - Lukavica and Gas Promet – in a relatively small gas market, which is considered to result in more barriers, towards both harmonization and the investment required to grow the gas market and ensure the reliability of energy supplies, compared with the other Contracting Parties.
- In Croatia, there is a lack of clarity in the respective roles of Plinacro (TSO) and INA (gas supplier), with INA performing some roles, including the interconnection arrangements at the border transfer point with Slovenia, that should be performed by the TSO in an unbundled environment.
Initial Proposals

The Contracting Parties Transmission System Operators (TSOs) are still in the relatively early stages of developing the commercial and operational parameters through which they will undertake natural gas transportation in the new market environment, although some, such as Croatia, are relatively more advanced than others.

In this context, there would appear to be few, if any, significant obstacles to improving interconnection, interoperability, transparency and harmonisation of the operational rules. It should be said, however, that each Contracting Party TSO appears to be developing the commercial and operational parameters somewhat in isolation from each other. This is not necessarily in line with the targeted creation of a single regulatory environment for gas trade, to which the Contracting Parties are committed based on the Energy Community Treaty.

The initial proposals outlined below draw largely on the general conclusions in above.

Contracting Party TSO Working Group

A Contracting Party TSO Working Group (TSOWG) should be set up, probably under the auspices of the Energy Community, with a remit to ensure that all the rules, regulations and procedures necessary for harmonisation and interoperability both within the Contracting Parties and with neighbouring EU Member States, are adopted and implemented. The TSOWG, once established, could take responsibility for ensuring the remaining proposals below are implemented. In the future the TSOWG could also provide a link between the EC and the proposed Network of Transmission Operators under the third EC package for gas. Ideally, this TSOWG should also include TSOs from neighbouring countries to be really effective.

Interconnection Agreements

Common TSO to TSO Interconnection Agreements (IAs) should be put in place at all interconnection points both between Contracting Parties and also EU Member States. The IAs should be based on the EASEE-gas common business practices (CBP). The CBP requires that an IA between two TSOs should cover both technical and commercial interoperability issues including the following:

- Matching – the exchange of information, to arrive at matched quantities, based on nominated quantities and taking into account constraints
- Rules for Flow Control – agreements on rules of how flow control will be handled at interconnection point, and rules on changing flow rates
- Measurement Principles of gas quantities and gas quality, in line with international standards, taking into account procedure, accuracy and quality assurance, allocation of differences, metering corrections, exchange of metering data, access to calibration data and audit reports
- Gas Quality Specifications
- Allocation Rules which ensure consistency, description of allocation method and close out period for revision to allocations
- Procedures for balancing shipper flows and dealing with imbalances
- Co-ordination of Operation
- Information Exchange between adjacent TSOs
- Exceptional Events
- Changes to the IA
The IAs will effectively cover many of the issues necessary for harmonisation and interoperability. More detail on the requirements for an IA are included in Appendix 1.

Network Code Harmonisation

The respective network codes in the Contracting Parties TSOs should be harmonised with each other and with the proposed IAs. The respective Network Code drafts currently being prepared should be compared to ensure that they do not conflict with each other and allow for the simple and effective transportation of gas across the Contracting Parties. For example an approach for the convergence of balancing regimes should be sought, enabling the efficiency of cross border flows, which will be essential in the medium to long term, despite the current small market sizes and few entry-exit points. The Network Codes must also focus on enhancing information provision and transparency, regarding services offered by TSOs, in compliance with Regulation 1775.

Only one country, at present, has provided its Draft Code in English, and therefore no preliminary conclusions can be made as to the level of harmonisation achieved. However, at a minimum, the Network Codes should be harmonised as far as possible in the areas of:

- Defining (i.e. entry/exit, point-to-point, postal system) and booking capacity, including dealing with capacity overruns and congestion management, the time of the gas day and, if possible, tariff methodologies and systems;
- The process of, and timetable for, nominations and renominations, scheduling gas flows, and the procedures for allocating gas flows to shippers after the gas day;
- The calculation and resolution of shipper imbalances, including any imbalance charges;
- Gas specification, including dealing with off-specification gas;
- Publication of information and method of publication; and
- System emergencies, and the procedures for dealing with them, and the arrangements for dealing with operational difficulties, which may restrict the flow of gas on the day and/or reduce the availability of capacity.

The general aim of the harmonisation of the Network Codes would be for the different transmission systems to operate as smoothly as though they were a single system.

Initial Balancing Regimes

As noted in the conclusions, in more advanced balancing systems, shippers can be “cashed-out” on a daily basis, where a liquid trading market for gas exists. For the Contracting Parties, however, a liquid trading market is some way off. As part of the Network Codes, therefore, it would be recommended that a physical “in-kind” or “make-up” balancing regime is initially put in place. In such a “make-up” regime, each shipper has a running imbalance account and is generally obligated to keep this account as close to zero as possible, by making up any negative imbalance on one day with a positive imbalance on subsequent days. Shippers can be incentivised to maintain the zero imbalance through regulated charges for not reducing imbalances within a defined period. Make Up balancing regimes can also be used in Interconnection Agreements at the cross border points.
Investment Planning

The TSOs should produce, annually, a collective “10 Year Development Statement”, similar to those produced by TSOs in the EU Member States. The statement, or plan, would cover demand and supply forecasts (both annual and peak), the requirement for transportation capacity both on the Contracting Parties TSOs and requirements for upstream capacity and any commercial and regulatory developments which are likely to impact the TSOs.

Upstream Capacity: TSO Booking

Ideally, the Contracting Parties TSOs should take responsibility for contracting capacity on upstream pipelines, with the gas suppliers / shippers then booking capacity on a “virtual” pipeline system from the point at which they take title to the gas, through to their end user. The appropriate back-to-back agreements with shippers and regulatory rules would need to be put in place to ensure that the TSOs were not left with any investment in stranded capacity. The idea behind this is that ultimately this could promote competition in the various markets since, if end users opted to change supplier, that supplier could easily gain access to the upstream capacity as it could be automatically incorporated in the normal booking of capacity made when the end user changes. This structure would help to prevent the hoarding of capacity by the incumbent gas suppliers.

Upstream Capacity: Collective Booking

The Contracting Parties TSOs could also collectively contract for capacity on upstream pipelines as a consortium, enabling more efficient use of capacity. This may help stimulate investment in expanding existing routes and building new ones. As a consortium the Contracting Parties TSOs could make a larger booking on upstream pipeline systems than if they were booking on their own. They may also be able to book less capacity than they would if they each had to individually cover their own capacity requirements. Once the total capacity had been booked it could then be allocated between the TSOs as required with procedures for simple capacity transfers between TSOs as and when necessary.

Improvement of metering

Despite recent plans for new meters and SCADA systems, lack of metering is noted in several cases, e.g. in FYR of Macedonia downstream metering is not accurate, in BiH SCADA is partially used, and also in Serbia lack of adequate metering has been reported. Therefore modernisation of metering infrastructure should be seen as a priority. As an initial area of work, a simple audit of metering and technical, including software, requirements could be undertaken to identify the potential system gaps which could maybe attract donor support.

Harmonisation of Transportation Tariffs

Currently the Contracting Parties TSOs transportation tariff methodologies are all postage stamp. This structure is helpful to harmonisation and interoperability. If any changes are made to tariff methodologies, perhaps moving towards the entry – exit methodology favoured in many EU Member States, then such changes should be co-ordinated and harmonised.
Technical Assistance and Training for TSOs

The conclusions identified a lack of knowledge and expertise, on behalf of TSOs and regulatory authorities, in the commercial and regulatory implications of the changing gas market environment. Specific assistance and training, tailored to the needs of the Contracting Parties, would benefit all the TSOs and regulatory authorities.
1 INTRODUCTION

1.1 TERMS OF REFERENCE

Energy Markets Partners LLP (EMP), with the co-operation of LDK Consultants, has been engaged by the Energy Community to undertake a Study on Improvement of interconnection, interoperability, transparency and harmonisation of operational rules for natural gas transportation in the Energy Community. The Contracting Parties, as members of the Energy Community, for this study are Albania, Bosnia & Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Serbia and UNMIK.

Of the seven members listed above, only four: Bosnia & Herzegovina, Croatia, FYROM and Serbia have existing gas transmission systems in operation. However, all of the other members are interested in developing gas markets and will be included in the study with the National Regulatory Authority being the main source of information.

The final report to be produced as the outcome of this contract will identify any operational obstacles including technical difficulties to the improvement of interconnection, interoperability, transparency and effectiveness of natural gas transmission in the energy community, with a view to improved gas trade and network utilization. These topics are briefly discussed below.

The final report will also suggest, for each Contracting Party, the main remedial actions that are necessary to remove such obstacles, and suggestions for the harmonization of technical market rules, aimed at increasing market integration and liquidity.

Proposed solutions will be based on those adopted in the European Union and consider, as far as feasible, the best practices of the EU Member States.

The Consultant will investigate the operational developments of gas transmission under Third Party Access in Contracting Parties and the EU Member States with which they are interconnected, with a view to:

- identifying the necessary steps for the full integration and interoperability between neighbouring Contracting Partners and EU Member States;
- promoting good practice in gas transmission and compliance with Regulation on Conditions for Access to the Gas Transmission Networks, Regulation 1775;
- promoting good practice in gas balancing taking into account the relevant ERGEG guidelines;
- promoting the eventual adoption of Common Business Practices defined by EASEE-gas;
- adopting transparent capacity calculation methodologies and their publication, taking into account the relevant ERGEG Guidelines;
- illustrating the necessary methodological improvements to the personnel of transmission system operators and regulatory authorities;
- identifying the main related requirements including network enhancements, metering and other equipment, software, and the necessary personnel training.
Analyze current capacity availability as well as allocation and congestion management methodologies, starting from results of the 2007 Gas Survey, with a view to:

- Describing existing capacity allocation methods;
- Ascertaining to what extent reduced pipeline use is due to lack of demand, capacity reservation by long term contracts, or other causes including upstream difficulties;
- Diversified supplies and increased market liquidity;
- Suggesting remedies aimed at improving existing capacity and its use in the short and medium term;
- Suggesting new methodologies for capacity allocation and congestion management to be included in the new market rules;
- Proposing criteria for harmonisation of the market rules in the Contracting Parties.

Analyze current methods used for balancing transmission networks including resort to storage facilities, with a view to improve the viability of the network and facilitate trading and entry of new suppliers:

- Examine possible alternatives and any difficulties to implement them;
- Propose a roadmap towards more advanced and market-oriented balancing regimes, also considering the ERGEG Guidelines on storage and flexibility services.

In order to undertake this study, EMP will need to collect information on the transmissions system operator (TSO) and the regulatory system. As a consequence EMP intends to arrange visits and meetings with the TSOs and regulatory authorities where Contracting Parties have existing gas transmission networks, which are located in Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia and Serbia. For Contracting Parties that do not currently have gas transmission, the Consultant will gather information submitted by their National Regulatory Authorities by electronic and/or paper means.

In line with the Service Specifications the Consultant will carry out the study in three stages. The first stage will involve preliminary desk work and the second stage will move on to field work. The third and final stage is to draft and present the final report to the Gas Working Group of the ECRB.

**Preliminary desk work**

For all Contracting Parties, the consultant will perform the following activities:

1. Collect preliminary information on the transmission system operator and the regulatory system;
2. Draft a preliminary report outlining results of the desk work and proposing a list of issues for field analysis;
3. Present and discuss the preliminary report in a meeting with the ECS (ECRB Section).

**Field work**

For each Contracting Party, the consultant will:
4. Visit transmission system operators and regulatory authorities;
5. Draft preliminary conclusions and proposals for the above topics;
6. Submit preliminary proposals to transmission system operators, the regulatory authorities and the ECS in a meeting to be arranged on the spot.

Wrap up and discussion

The consultant will:

7. Draft a final report.
8. Present and discuss the final report at a meeting of the Gas Working Group of the ECRB.

The final report will contain the findings of the study and recommendations for each of the Contracting Parties.

1.2 SCOPE OF THE FINAL REPORT

The final report covers the following areas:

- Firstly a review of the key EU Regulations and Guidelines, including the Gas Directives, Regulation 1775, the various Guidelines for Good Business Practices and the EASEE Gas Common Business Practices. These regulations and guidelines taken together represent best practice in regard to gas transportation both within individual countries in Europe and for cross-border trade in gas. The various requirements and recommendations of each document are used as benchmarks to compare existing practices in the Contracting Parties and in the EU Member States with which they are interconnected.
- Secondly, a review, based on desk research and information gathered from the Contracting Parties, of the transmission system operations for the four Contracting Parties with existing systems and the regulatory systems, in place and proposed, for all the Contracting Parties.
- Thirdly, a report on the field visits, with detailed meeting reports in an appendix.
- Fourthly, conclusions based on the desk research and meetings with the Contracting Parties; and
- Fifthly, initial proposals for discussion with the Gas Working Group.
2 EU REGULATIONS AND GUIDELINES

2.1 OVERVIEW

In this section we review the regulatory framework which guides the gas industry in Europe. As well as the gas Directive itself there are a number of documents setting out Guidelines for Good Practice and Common Business Practices. Whilst many of the guidelines are voluntary the Guidelines for Good Practice for Access to Gas Transmission Networks has been developed into a legally binding Regulation (1775) and it remains a possibility that other agreements will also become mandatory in future.

In this report we concentrate mainly on those aspects of the regulatory framework which have an impact on Interconnection, Interoperability, Transparency and Harmonization of Operational Rules for Natural Gas Transportation. This framework will be used to assess how improvements can be made in these aspects in the Energy Community.

The material covered falls roughly into three parts:

- Existing EU Directives and Regulation
- Voluntary Codes and Proposals put forward by the ERGEG
- Common Business Practices approved by EASEE-gas

2.2 THE SECOND GAS DIRECTIVE

2.2.1 Purpose and Scope of the Directive

The second gas Directive (2003/55/EC) establishes common rules for the transmission, distribution, supply and storage of natural gas. It lays down the rules relating to the organisation and functioning of the natural gas sector, access to the market, the criteria and procedures applicable to the granting of authorisations for transmission, distribution, supply and storage of natural gas and the operation of systems.

For the purposes of this study, the most important chapters of the second gas Directive (2003/55/EC) are Chapter III on Transmission Storage and LNG and Chapter VI which deals with the Organisation of Access to the System. See Table for a summary of the Chapters and Articles included in the Directive.
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2.2.2 Tasks of system operators

The Directive requires member states to designate one or more Transmission, Storage and LNG operators to undertake the following tasks:
(a) operate, maintain and develop under economic conditions secure, reliable and efficient transmission, storage and/or LNG facilities, with due regard to the environment;
(b) refrain from discriminating between system users or classes of system users, particularly in favour of its related undertakings;
(c) provide any other transmission system operator, any other storage system operator, any other LNG system operator and/or any distribution system operator, sufficient information to ensure that the transport and storage of natural gas may take place in a manner compatible with the secure and efficient operation of the interconnected system;
(d) provide system users with the information they need for efficient access to the system.

Gas balancing rules adopted by Transmission System Operators must be objective, transparent and non-discriminatory. Terms and conditions, including rules and tariffs, for the provision of balancing services by transmission system operators shall be established pursuant to a methodology approved by the regulatory authority in a non-discriminatory and cost-reflective way and shall be published.

Member States may require transmission system operators to comply with minimum requirements for the maintenance and development of the transmission system, including interconnection capacity. Transmission system operators shall procure the energy they use for the carrying out of their functions according to transparent, non-discriminatory and market based procedures.

In this section we review the terms of the second gas Directive in relation to gas transit. We divide the discussion into two parts dealing firstly with existing infrastructure and secondly with the exemptions which are potentially available for new infrastructure projects.

2.2.3 Unbundling

The Directive requires unbundling of transportation from supply business on a legal basis. That is Transmission may run in a subsidiary company which is independent at least in terms of its legal form, organisation and decision making from other activities not relating to transmission. Ownership unbundling is not required.

As a minimum the following criteria must be met to ensure independence of the TSO:

(a) The transmission business management team may not participate in company structures of the integrated natural gas undertaking responsible, directly or indirectly, for the day-to-day operation of the production, distribution and supply of natural gas;

(b) appropriate measures must be taken to ensure that the professional interests of persons responsible for the management of the transmission system operator are taken into account in a manner that ensures that they are capable of acting independently;

(c) the transmission system operator shall have effective decision-making rights, independent from the integrated gas undertaking, with respect to assets
necessary to operate, maintain or develop the network. However, the parent company may approve the annual budget of the transmission system operator and to set global limits on the levels of indebtedness of its subsidiary. It shall not permit the parent company to give instructions regarding day-to-day operations, nor with respect to individual decisions concerning the construction or upgrading of transmission lines, that do not exceed the terms of the approved budget.

(d) the transmission system operator shall establish a compliance programme, which sets out measures taken to ensure that discriminatory conduct is excluded, and ensure that observance of it is adequately monitored. The programme shall set out the specific obligations of employees to meet this objective. An annual report, setting out the measures taken, shall be submitted by the person or body responsible for monitoring the compliance programme to the regulatory authority and shall be published.

Transmission, storage and/or LNG system operators are required to preserve the confidentiality of commercially sensitive information obtained in the course of carrying out its business, and shall prevent information about its own activities which may be commercially advantageous from being disclosed in a discriminatory manner. Transmission system operators shall not, in the context of sales or purchases of natural gas by related undertakings, abuse commercially sensitive information obtained from third parties in the context of providing or negotiating access to the system.

2.2.4 Third Party Access

The Directive specifies Regulated Third Party Access for Transmission Distribution and LNG assets whereas Negotiated TPA is allowed for storage. Third party access to the transmission and distribution system, and LNG facilities must be based on published tariffs, applicable to all eligible customers, including supply undertakings, and applied objectively and without discrimination between system users. These tariffs, or the methodologies underlying their calculation shall be approved by the regulator and published prior to their entry into force.

Transmission system operators shall, if necessary for the purpose of carrying out their functions including in relation to cross-border transmission, have access to the network of other transmission system operators. The provisions of the Directive do not prevent the conclusion of long-term contracts in so far as they comply with Community competition rules.

For access to storage facilities and linepack Member States may choose either or both regulated or negotiated TPA.

Existing Infrastructure

The second gas Directive (2003/55/EC) abolished the legal distinction between gas flows in transit and gas flows in transport. Hence, theoretically at least, all of the requirements of the Directive regarding regulated and ex-ante tariffs and fair and non-discriminatory treatment of shippers should apply to cross-border transit. However, Article 32(1)2 of the

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2 To be precise, Article 32(1) repeals Council Directive 91/296/EEC of 31 May 1991 on Transit of natural gas in grids with effect from 1 July 2004, without prejudice to contracts concluded pursuant to Article 3(1) of that Directive which shall continue to be valid and to be implemented under the terms of the said Directive.
Directive allows long term legacy contracts to remain valid and implemented under the terms applied at the time of their conclusion.

As noted above, much of the infrastructure used for gas transit in Europe was constructed in conjunction with long term gas contracts and access to capacity was arranged under associated long term capacity contracts. It follows that for a transition period, determined by the duration of existing gas and capacity contracts, gas transit covered by Article 32(1) falls outside the access regime specified by the Directive and such third party access as there may be is offered on a negotiated basis rather than a regulated basis. Indeed according to the European Commission current practice in most Member States involved with gas transit is for transit operations to continue on a “business as usual” basis under negotiated terms. The only exemption to this rule is Poland where transit tariffs are approved by the regulatory authority.

Any new contracts (including long-term contracts) signed after Directive 2003/55/EC came into force do not have the protection of Article 32(1). However, the Commission notes that it is not aware of any long term contracts for transit capacity being signed since the Directive came into force and this would account for an almost total absence of regulated access to transit pipelines. The Commission also points to some specific arrangements which circumvent the requirement for regulated access. For example, in Belgium, all transit contracts are operated and marketed by Distirgaz, which is not the TSO but has contracted for all transit capacity on the primary market from the TSO (Fluxys). Consequently Distirgaz sells the capacity on the secondary market, which is not regulated by the Directive, and does so under negotiated terms. This situation is likely to change as a result of a concession put forward by Gaz de France in pursuit of EU approval for its takeover of Suez.

Frequently incumbent companies have control of transit pipelines in another country upstream of their domestic markets. As already mentioned Gaz de France jointly owns and operates the Megal pipeline which transits Russian gas through Germany to the French border. ENI has controlling interests in all of the transit pipelines that currently supply Italy via Austria, Switzerland and North Africa. This has given rise to considerable frustration on behalf of the Italian regulator since ENI's market dominance owes much to its control of pipelines outside Italian territory and therefore beyond the Italian regulators' jurisdiction. Under the legal provisions implementing the Directive in several Member States, the regulatory authorities do not have jurisdiction over pipelines used for transit purposes. Thus transit pipelines can, and sometimes do, fall outside the competence of regulators both in the transit country and in the country where the gas is being delivered.

The EU Gas Regulatory Forum meeting in Madrid in September 2005 recognised that effective regulation of transit pipelines was a problem in developing effective competition in Europe. The Commission expressed a view in that context that the relevant provisions of Regulation 1775 (which is discussed in the following section) apply to existing contracts including transit. Notwithstanding this view, problems with the regulation of transit pipelines are likely to intensify calls for a European-wide regulator which would have competence in gas (and electricity) transit operations which fall through the gaps between the areas of responsibility of national regulators.

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New Infrastructure Projects

Article 22 of the gas Directive allows for exemptions from the Third Party Access rules for major new gas infrastructures, i.e. interconnectors between Member States, LNG and storage facilities. Such exemptions can be granted subject to the following conditions.

(a) the investment must enhance competition in gas supply and enhance security of supply;

(b) the level of risk attached to the investment is such that the investment would not take place unless an exemption was granted;

(c) the infrastructure must be owned by a natural or legal person which is separate at least in terms of its legal form from the system operators in whose systems that infrastructure will be built;

(d) charges are levied on users of that infrastructure;

(e) the exemption is not detrimental to competition or the effective functioning of the internal gas market, or the efficient functioning of the regulated system to which the infrastructure is connected.

The exemptions also apply to significant increases of capacity in existing infrastructures and to modifications of such infrastructures which enable the development of new sources of gas supply.

In terms of procedure, project developers must apply to the relevant regulatory authority which may, on a case by case basis, decide on the exemption. However, Member States may provide that the regulatory authorities shall submit, for formal decision to the relevant body in the Member State, its opinion on the request for an exemption. This opinion shall be published together with the decision.

The exemption decision, including any conditions attached, shall be duly reasoned and published. Decisions on granting exemptions have to be notified to the EC together with relevant information and the Commission has the right to request further information, to seek amendment to the decision or to have the decision withdrawn.

In the case of an interconnector, any exemption decision shall be taken after consultation with the other Member States or regulatory authorities concerned. The exemption may cover all or parts of the project and consideration shall be given, on a case by case basis, to the need to impose conditions regarding the duration of the exemption and non-discriminatory access to the interconnector. In considering the imposition of such conditions particular account shall be taken of the duration of contracts, additional capacity to be built or the modification of existing capacity, the time horizon of the project and national circumstances.

When granting an exemption the relevant authority may decide upon the rules and mechanisms for management and allocation of capacity insofar as this does not prevent the implementation of long term contracts.

Last year, ERGEG was asked to submit to the Commission its view on Art. 22 EC/2003/55 and a possible change of the legal framework with respect to investment issues. ERGEG’s
report summarizes the results of ERGEG’s questionnaire on Article. 22 experience and on established and/or already applied criteria for dealing with Art. 22 applications.

The report references the Energy Community’s draft paper on New Gas Infrastructure Investment Regulation (NGIIR) which also addresses a number of issues related to new investments. In addition to TPA rules (NGIIR Annex 1), it deals with Art. 22 (NGIIR Annex 2), as well as with institutional issues. With respect to the subject-matter of Art. 22, the NGIIR focuses on questions of the relevant market, unbundling requirements, and the importance of open season procedures.

As of September 2007, there had been a total of eight exemptions under Article 22 and eight others were pending with the responsible regulators. If this practice continues, a significant amount of exempted infrastructure will develop over the next years. From the data received, it can already be noted that not only is there a widespread application of Art. 22, but also a varying practice in the interpretation and application of Art. 22.

Diverging practices in the application of Art. 22 could be identified in particular with respect to the following aspects:

- Definition of market power along with definition of affected markets
- Definition of criteria required by Art. 22
- Duration of exemption
- Type of exemption granted
- Conditions attached to exemption
- Share of exempted capacity
- Role of short-term contracts

ERGEG noted that these varying practices can lead to diverging frameworks for competition in Member States and therefore pose a barrier to the single competitive European market for natural gas. As a result, investors could be incentivised to invest where exemptions are most easily granted and conditions are most favourable, rather than where infrastructure is actually needed. Ensuring consistency in the regulators’ approach would contribute to avoid “forum shopping” by investors and would also ensure equal treatment of investors.

All applications treated by NRAs were eventually granted (most of the exemptions granted were subject to certain conditions attached). Only in one case did the European Commission exercise its right under Art. 22 paragraph 4 to request amendments to a decision granting an exemption (i.e. BBL interconnector). There is no case where the Commission asked to withdraw an exemption grant.

Should this practice of granting exemptions for all major new infrastructure for which they are requested (as well as granting the exemptions more extensively) continues, this could

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5 Includes only exemptions granted by regulators (UK and Italy). Where other authorities, e.g. ministries, are competent, data has not been submitted.
lead to a difficult co-existence of exempted and non-exempted infrastructures and, therefore, could create a barrier to the creation of a single European market.

Based on these findings, EGREG recommended a more defined and EU-wide consistent approach for assessing exemption requests should be elaborated. Guidance on the conditions that should be put in place if an exemption is granted should also be developed. Therefore, and following the EC’s request, an ad hoc task force has been established to develop guidelines for the treatment of Art. 22 or alternatively, to propose changes/amendments to Art. 22 itself. These guidelines (or the proposal for Art. 22 amendments) will build upon the draft NGIIR and the earlier work of the former workstream “TNI,” which will result in a separate paper.

### 2.3 REGULATION 1775

The European Gas Regulatory Forum (the Madrid Forum) agreed in February 2002 on a set of guidelines (usually referred to as “Guidelines for Good TPA Practice”) which transmission system operators pledged to respect. A more detailed and comprehensive set of guidelines were adopted by the Madrid Forum in September 2003 (GGP2).

These guidelines were non-binding and agreed on a voluntary basis but, in the view of the Commission, there was an unacceptable degree of non-compliance which led to the rules and principles contained in the guidelines forming the basis of a new Regulation on conditions for access to gas transmission networks. The Regulation was adopted by the European Parliament in September 2005 and came into force on 1st July 2006.

The scope of the Regulation covers long-term contracts for gas transit in high-pressure pipeline systems as well short-term capacity booking systems. However, as described in the preceding section most long term contracts in Europe precede the Gas Directive and were executed within the framework of Directive 91/296 EEC which allowed for long term contracts on a negotiated basis. Although Directive 91/296 EEC was appealed by the gas Directive, contracts signed under it remain valid. However, prices under the long term contracts were individually negotiated and will not in general be cost reflective and will differ from the regulated tariffs available in the market.

The European Regulators’ Group for gas and Electricity (ERGEG) says that in cases where tariffs of existing contracts concluded pursuant to Article 3.1 of the repealed Directive are different from the tariff of new or renegotiated contracts, it is up to regulators to make transparent for standard transportation cases the difference between actual and regulated tariffs according to the Gas Regulation⁶.

By making such differences transparent ERGEG is highlighting the conditions in Directive 91/296 EEC which include that tariffs should be non-discriminatory. Where there are grounds for believing that tariffs are discriminatory, shippers could have recourse to European Competition law (Articles 81 and 82 of the EC-Treaty) and ERGEG suggests that TSOs may have an interest in changing (renegotiating) these contracts in order to avoid discrimination cases.

The main topics addressed by the Regulation and the associated guidelines include:

- The criteria for setting tariffs for TPA

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⁶ ERGEG, Report on the Transmission Pricing (for Transit) and how it interacts with Entry-Exit Systems. Ref E06-GFG-18-03.
- A Common minimum set of TPA services
- Common Rules regarding contractual congestion of networks
- Information in particular on technical requirements and available capacity
- Rules on fair balancing systems
- Common basic requirements for trading of capacity

Specific aspects of the Regulation which have a direct bearing on cross-border trade are discussed below.

Article 3, paragraph 2 requires TSO’s to co-operate to improve convergence of tariff structures and balancing regimes to enhance opportunities for cross-border trade.

*Tariffs for network access shall not restrict market liquidity nor distort trade across borders of different transmission systems. Where differences in tariff structures or balancing mechanisms would hamper trade across transmission systems, and notwithstanding Article 25(2) of Directive 2003/55/EC, transmission system operators shall, in close cooperation with the relevant national authorities, actively pursue convergence of tariff structures and charging principles including in relation to balancing.*

Article 5 paragraph 2(c) requires that capacity allocation mechanisms shall be:

*compatible with network access systems of the Member States*

Article 7, paragraph 7 calls for harmonisation of balancing regimes and balancing charges:

*Member States shall ensure that transmission system operators endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate gas trade.*

Article 10 requires that Regulatory Authorities should cooperate with each other and with the Commission.

The GGP2 Guidelines are attached to the Regulation as an Annex. The guidelines can be changed by the Commission.

Of particular relevance to cross border trade are the following:

**Guideline 1(8)**

*Transmission system operators shall cooperate with other transmission system operators in coordinating the maintenance of their respective networks in order to minimise any disruption of transmission services to network users and transmission system operators in other areas and in order to ensure equal benefits with respect to security of supply including in relation to transit.*

Guideline 3.1 requires certain information to be published to provide network users with adequate access to the system, including

*a detailed description of the gas system of the transmission system operator indicating all relevant points interconnecting its system with that of other transmission system operators and/or gas infrastructure such as Liquefied Natural Gas (LNG) and infrastructure necessary for providing ancillary services as defined by Article 2(14) of Directive 2003/55/EC;*
Guideline 3.2 (c) specifies that all points connecting different networks of transmission system operators are included in the definition of ‘relevant points’ for which requirements to publish information are specified in paragraph 3.3 which is reproduced below:

**Information to be published at all relevant points and the time schedule according to which this information should be published**

1. At all relevant points, transmission system operators shall publish the following information about the capacity situation down to daily periods on the Internet on a regular/rolling basis and in a user-friendly standardised manner:
   - (a) the maximum technical capacity for flows in both directions,
   - (b) the total contracted and interruptible capacity,
   - (c) the available capacity.

2. For all relevant points, transmission system operators shall publish available capacities for a period of at least 18 months ahead and shall update this information at least every month or more frequently, if new information becomes available.

3. Transmission system operators shall publish daily updates of availability of short-term services (day-ahead and week-ahead) based, inter alia, on nominations, prevailing contractual commitments and regular long-term forecasts of available capacities on an annual basis for up to 10 years for all relevant points.

4. Transmission system operators shall publish historical maximum and minimum monthly capacity utilisation rates and annual average flows at all relevant points for the past three years on a rolling basis.

5. Transmission system operators shall keep a daily log of actual aggregated flows for at least three months.

6. Transmission system operators shall keep effective records of all capacity contracts and all other relevant information in relation to calculating and providing access to available capacities, to which relevant national authorities shall have access to fulfill their duties.

7. Transmission system operators shall provide user-friendly instruments for calculating tariffs for the services available and for verifying on-line the capacity available.

8. Where transmission system operators are unable to publish information in accordance with paragraphs 1, 3 and 7, they shall consult with their relevant national authorities and set up an Action Plan for implementation as soon as possible, but not later than 31 December 2006.

### 2.4 ENERGY CHARTER TREATY

The provisions of the Energy Charter Treaty related to gas transit tariffs are contained primarily in Article 7 of the ECT and Article 10 of the draft Transit Protocol:

a. Each Contracting Party shall take all necessary measures to ensure that Transit Tariffs and other conditions are objective, reasonable, transparent and do not
discriminate on the basis of origin, destination or ownership of Energy Materials and Products in Transit.

b. Each Contracting Party shall ensure that Transit Tariffs and other conditions are not affected by market distortions in particular those resulting from abuse of a dominant position by any owner or operator of Energy Transit Facilities used for Transit.

c. Transit Tariffs shall be based on operational and investment costs, including a reasonable rate of return

This means that non-discrimination of shippers as to the origin, destination, ownership and pricing of energy in transit as well as objective, reasonable, transparent, non-discriminatory and cost based grid tariffs are requirements for gas transit according to the Energy Charter Treaty.

2.5 GUIDELINES FOR GOOD PRACTICE FOR GAS BALANCING

In July 2005, The European Regulators Group for Electricity and Gas (ERGEG) published a paper on Gas Balancing for public consultation. The consultation paper set out the key issues associated with gas balancing and requested comments on proposed changes. The July 2005 paper also proposed, based on the high level principles, the development of more detailed Guidelines for Good Practice for Gas Balancing (GGPGB).

ERGEG’s proposals for GGPGB were published in April 2006 in a paper which summarises, and sets out ERGEG’s view on, the key issues raised by respondents to the July 2005 consultation paper. The paper also includes a final version of the high level gas balancing principles.

The key issues raised in the consultation process were;

1. Balancing Periods
2. Provision of linepack as an unbundled service
3. Pooling and trading of imbalance positions and the use of tolerance levels
4. Cross border trade and harmonization of neighbouring balancing regimes
5. Graduated incentives for imbalance
6. Information required by the market
7. Transit/Transportation

Many respondents to ERGEG consultation suggested that differences in cross border balancing regimes do have an impact on cross-border trade and competition. However, it was recognised that this does not necessarily mean that all balancing regimes must be the same.

Key issues raised included that:

- The use of similar balancing regimes between neighbouring countries is likely to improve the availability and efficiency of cross border flows;
- Balancing regimes should support interoperability but do not necessarily have to be the same;
- Whilst convergence criteria could be developed for balancing regimes it is unlikely to lead to completely harmonised balancing regimes;
Many cross-border issues relate to capacity availability and renomination rights and as such any focus of harmonisation should be in these areas; The use of OBA's that focus on the interaction between gas balancing regimes in neighbouring countries could help mitigate risk; Closer cooperation between regulators, TSOs and system users is important; and There are benefits in neighbouring regimes having similar characteristics such as balancing periods and cash-out mechanisms.

In response to these issues ERGEG is proposing the following high level principle for inclusion in the GGPGB (see Figure 1).

The principle is indeed couched in high level terms and it is short on specific recommendations. However, we see the main thrust of the initiative as being that TSOs should endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate gas trade as already required by Regulation 1775 (see above).

A timetable should be published for achieving harmonisation.

There may be reasons for balancing regimes to differ in neighbouring countries but the differences should be set out clearly so that shippers can understand how they may impact on the movement of gas between the two systems. TSOs need to explain any reasons why it is not possible to harmonise balancing regimes. Where justifiable differences exist, Interconnection Agreements need to be put in place which are transparent and involve consultation with shippers and the National Regulatory Authority. Interconnection Agreements are discussed in Section 2.10 below.

**Figure 1 High Level Principle on Harmonisation of Balancing Rules**

**Principle 7 Harmonisation of balancing rules**

TSOs should ensure compatibility of balancing regimes (tolerances, imbalance charges etc) in order to facilitate gas trade across borders of different TSO systems. European TSOs shall endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate trade. Where it is justified that balancing regimes (tolerances, imbalance charges, balancing periods etc) remain different between interconnected networks, “standardised agreements” and procedures between TSOs should be put in place in order to facilitate gas trade.

These agreements could include a number of things including the way in which the balancing regimes interact; identify key differences and the reason why they exist; the impact of any differences on trade and the incentives provided to shippers and TSOs; and how any differences in arrangements for dealing with safety and security impact on trade, incentives and costs. They could also identify areas for harmonisation and a timetable for making changes. To ensure transparency, any agreements should be open to consultation with all market participants and fully involve the relevant NRA.
ERGEG finalised its guidelines for good practice for gas balancing (GGPGB) in December 2006 and submitted it to the European Commission (EC) as its advice on interpretation of Article the Gas Regulation. The GGPGB were developed through a transparent consultation process and input was received from a wide range of stakeholders including transmission system operators (TSOs), shippers, suppliers, traders and customers. ERGEG has recommended to the EC that the GGPGB be made binding in some form to help ensure effective implementation of the necessary documents across the EU. The EC proposed that ERGEG produce an “Impact Assessment” (IA) on the likely 'impact' of making the GGPGB binding in some form. The IA found that making guidelines binding would be beneficial in terms of helping to ensure: security of supply; non-discrimination; transparency; o consistency and market integration; reducing barriers to entry to and the development of competition’.

2.6 GUIDELINES FOR GOOD THIRD PARTY ACCESS PRACTICE FOR LNG SYSTEM OPERATORS

The GGPLNG relate to Third Party Access (TPA) to LNG facilities in accordance with Article 18 of the Gas Directive, which establishes the implementation of a regulated TPA (rTPA) system for LNG facilities based on published tariffs; whereby at least the tariff methodologies are approved by the regulatory authority prior to their entry into force.

A first step towards establishing common rules for access to rTPA LNG facilities was made with the adoption of two framework documents at the 5th Madrid Forum in 2002: Recommendations on Guidelines for Good Practice in relation to TPA services, tariffication, balancing, etc.1 and Guidelines on calculation methodologies and transparency requirements with regard to available capacities of gas transmission, LNG and storage facilities2.

The GGPLNG do not go beyond the Directive 2003/55/EC in creating or restricting TPA rights. The GGPLNG are intended as possible input from ERGEG for an amendment to Regulation 1775/2005 and its annexes. Before the approval of the modification of the Regulation these could serve as non-binding guidelines. For this reason, the paper is structured according to the above mentioned EU Regulation and does not repeat what is already stated in the Regulation. If a provision already existed in an approved document, the authors used approved wording when possible. The main sources used in drafting these guidelines are:

- The existing annex of Regulation 1775/2005
- Directive 2003/55/EC, especially the terms defined in article 2
- The two CEER papers presented at the 5th Madrid Forum in 2002, as mentioned above.

These Guidelines take into account the responses received to the consultation on the Draft Guidelines of Good TPA Practice for LNG. The responses received have been summarized in the Evaluation of Comments paper (E08-LNG-06-02).

The Guidelines cover the following areas:

- Tariffs principles and methodologies
- TPA services
2.7 GUIDELINES FOR GOOD PRACTICE FOR STORAGE SYSTEM OPERATORS

The GGPSSO concern Third Party Access to storage facilities in accordance with Articles 2(9) and 19 of the Gas Directive. They intend to give a minimum set of rules required for the organization of the market for storage capacity. They are forward looking and should be flexible enough to account for developments in market arrangements. They are addressed to all Storage System Operators (SSOs) as well as the storage users and relate to the implementation of the Gas Directive. The GGPSSO do not go beyond the Gas Directive in creating or restricting TPA rights to any storage facility or part thereof.

The purpose of these GGPSSO is to ensure that SSOs provide the services needed by storage users on a fair and non-discriminatory basis. Systems and processes shall facilitate the sustainable development of competition in gas supply. These tasks are pursued taking into account technical constraints and the economically efficient use of the storage infrastructure.

The GGPSSO are not legally binding, and consequently must be consistent with national and European legislation. It shall be incumbent upon each SSO to demonstrate to the relevant national regulatory authority upon its request that it meets the guidelines. The relevant national regulatory authority should check that results in both regimes (nTPA and rTPA) are equivalent in terms of non-discrimination, transparency and competition. An overriding principle is that storage systems and processes implemented by the SSOs maintain secure, reliable and efficient operation of the storage system (Article 8(1.a) of the Gas Directive).

The date for Implementation was 1st April 2005.

2.8 CALCULATION OF AVAILABLE CAPACITIES

On 15 June 2007 ERGEG launched a public consultation on Calculation of Available Capacities. This public consultation focussed on the understanding of the various issues related to capacity calculation and was not yet a consultation on any kind of guidelines or recommendations. Whether there is a request for guidelines and any role for National Regulatory Authorities (NRAs) in the area of capacity calculation was dependent on the outcome of this public consultation.

The problem-setting is as follows. Adequate calculation of Available Capacity (AC) is crucial for effective capacity allocation and congestion management. Variations in the way available capacity is calculated generate risks for undue discrimination of new entrants and create obstacles for trading. The current capacity calculation practice across Europe is based on network scenarios (assumptions) per operational control area chosen by Transmission System Operators (TSOs) pursuant to their own judgements and policy. This flexibility in the hands of individual TSOs raises some concerns about proper available capacity calculation such as:

7 Understanding and Issues – An ERGEG Public Consultation Paper C06-CAP-06-03
• no guarantee for coordination: no industry-wide guidelines for network scenario selection are available;
• no guarantee that the TSO’s judgements in the selection of the network scenario are in line with the objective of creating a more fluid and more competitive market;
• no guarantee for consistency over time and across European networks;
• no guarantee that the generated level of available capacity corresponds to the maximum capability of the system;
• no transparency concerning any possible residual risks of interruption associated to the network scenario (reliability).

In light of the above mentioned concerns, ERGEG sought views on ways for greater transparency, greater consistency and optimisation of available capacity calculation throughout the EU’s gas transmission networks. Particularly, stakeholders’ views were sought on the following areas:

• transparency and communication of available capacity calculation across European networks;
• need for the regulation of capacity calculation and on the nature of recommendations for proper capacity calculation;
• consistency and coordination of available capacity calculation over both time and networks; and
• calculation process of available capacity and ways to optimise the level of available capacity and the use made of it.

There is a large degree of consistency in the responses of the different stakeholders. The public consultation shows in particular:

• a recognition of how ERGEG considers the issues surrounding the calculation of available capacities. ERGEG Public Consultation Paper is accepted as a common basis for next steps;
• an increased interest and awareness of the importance of adequate capacity calculation as a prerequisite for many Third Party Access (TPA) areas. For instance, transparency of data is only relevant if there is quality control of the information; congestion management may only be adequate if capacity is properly calculated, etc.;
• requests for more transparency relating to the input parameters for the capacity calculations and the methodologies. Network users also require transparency on the information behind AC figures;
• overall support to develop guidelines;
• overall support for ex ante approval of methodologies and key assumptions by NRAs. This is in addition to ex post investigations of TSO’s refusals of capacity.

2.9 OPEN SEASON PROCEDURES

In May 2006, during the 11th European Gas (Madrid) Regulatory Forum, the European Commission presented a set of draft explanatory notes on Regulation 1775/2005/EC, Art. 5, dealing with capacity allocation mechanisms and congestion management procedures. Among other things, these explanatory notes stated that further clarity was needed on the role of open season procedures. At the request of the EC, ERGEG began work on a set of draft Guidelines for Good Practice on Open Season Procedures (the draft GGPOS) aimed at ensuring that open season procedures are conducted in a non-discriminatory and transparent manner and result in efficient outcomes. The draft GGPOS identify what the purpose of an open season should be and how an open season should be structured.
The issues addressed by the guidelines include:

a. the fact that an open season is a useful instrument to assess the market demand for market capacity, but not the only one; the need to distinguish between the capacity allocation and market evaluation functions of an open season; and the fact that open seasons must take into account specific capacity allocation mechanisms and give consideration to short term capacity bookings;

b. the appropriateness of open season procedures for all capacity expansions, and in particular the consideration that should be given to the size of a project and whether it is subject to article 22 procedures;

c. the need for increased coordination between TSOs regarding cross-border and cross-TSO investments and projects, and the establishment of a unique interface;

d. the need for regulatory cooperation and coordination regarding cross border projects and for good coordination between regulators and TSOs.

The guidelines cover the following issues:

• Application. There are some investments for which open seasons will produce higher costs than benefits, or may be unfeasible. As a result, the present guidelines do not apply to all types of investments.
• The conditions that call for an open season
• The structure of the open season
• The results of the open season
• Coordination with adjacent SOs
• Coordination between national regulatory authorities

2.10 EASEE GAS COMMON BUSINESS PRACTICES

The European Association for the Streamlining of Energy Exchange-gas (EASEE-gas) was formed in 2002 with the aim of supporting the creation of an efficient and effective European gas market through the development of Common Business Practices (CBPs) that intend to simplify and streamline business processes between stakeholders.

The formation of EASEE-gas was prompted by the success of the Gas Industry Standards Board (GISB) in the USA. The GISB has now evolved into the North American Energy Standards Board (NAESB). EASEE-gas has the support of the European Commission and the European Regulators through the Madrid Forum.
As of September 2008, some fourteen Common Business Practices have been approved.

<table>
<thead>
<tr>
<th>CBP Reference</th>
<th>Title</th>
<th>Approval Date</th>
<th>Responsible Working Group</th>
</tr>
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<tr>
<td>2008-01/01</td>
<td>Secondary Capacity Trading</td>
<td>27 May 2008</td>
<td>Business Rules</td>
</tr>
<tr>
<td>2007-005/01</td>
<td>Release Periods</td>
<td>7/11/2007</td>
<td>Edig@s</td>
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<td>2003-003/02</td>
<td>Edig@s Protocol</td>
<td>7/11/2007</td>
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<td>2007-004/01</td>
<td>Connection Point Identifier Encoding</td>
<td>18/9/2007</td>
<td>Codes &amp;Definitions</td>
</tr>
<tr>
<td>2007-003/01</td>
<td>Company's Identifier encoding</td>
<td>18/9/2007</td>
<td>Codes &amp;Definitions</td>
</tr>
<tr>
<td>2007-002/01</td>
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<td>18/9/2007</td>
<td>IT Communications Network Working Group</td>
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<td>18/2/2004</td>
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</tr>
<tr>
<td>2003-001-01</td>
<td>Harmonisation of units</td>
<td>27/8/2003</td>
<td></td>
</tr>
</tbody>
</table>

Descriptions of these common business practices are contained in Appendix 2.

2.11 CONCLUSIONS

The EU regulatory framework is defined in the second Gas Directive and its implementation on national law. Various voluntary codes have been established by the industry through the Madrid forum process and one of these dealing with good practice for providing TPA services to transmission systems has been made legally binding with adoption of Regulation 1775. Compliance with the voluntary codes for storage, LNG and gas balancing has been generally poor and there is a possibility that these codes will be made binding as well.

Going beyond the legal framework there are various initiatives in Europe to improve commercial interoperability of pipelines to promote free flow of gas across borders. The main intent is to move towards harmonisation of transportation and balancing systems across Europe in general and in neighbouring countries in particular. Where it is justified that balancing regimes remain different between interconnected networks, standardised
agreements and procedures should be put in place in order to facilitate gas trade. As well as dealing with contractual issues, the standardised agreements should also set out the reasons why it has not been possible to harmonise systems together with an assessment of how differences will impact on trade and the incentives on shippers and TSOs. A timetable for making changes towards achieving harmonisation should also be set out.
3  REVIEW OF CONTRACTING PARTIES GAS MARKETS

This section covers the information collected on the Contracting Parties gas markets, both before and after the discussions with regulatory authorities and TSOs. Areas that are dealt with are market status, infrastructure, interconnections, contractual arrangements, expansion plans, regulatory regimes as well as major planned new international infrastructure projects affecting the development of the CP gas sectors. Information collected within this initial phase, will be enhanced from details to be collected during the site visits to be performed at the second stage of the assignment.

This section focuses on the CPs with existing gas markets – Bosnia and Herzegovina, Croatia, FYROM and Serbia – in terms of a description of their gas markets, and the regulatory systems and compliance with the EU acquis for all CPs. In addition, Appendix 3 covers the major international projects which may impact the region and Appendix 4 covers the gas markets and regulatory systems in countries bordering the CPs. Both the major projects and neighbouring countries markets may have significant implications for any proposals that are made.

3.1  TRANSMISSION SYSTEM OPERATORS

Among the EnC Contracting Parties only four of them are gasified, namely Bosnia and Herzegovina, Croatia, Serbia and FYROM. Gas transmission systems are not fully expanded, encompassing four interconnection points. Indigenous production is limited to Croatia and Serbia covering a limited part of demand, whilst all the remaining quantities are imported from one supplier, namely Gazprom.

3.1.1  Bosnia and Herzegovina

3.1.1.1  Gas market size

Natural gas in Bosnia and Herzegovina (BiH) is currently used in the industrial, commercial and households sectors (mainly within the capital of Sarajevo) but not in electricity production, whilst only a few areas of the country have access to gas supply.

The present market is dominated by two large industries (55%), Birač Zvornik (alumina plant) and Arcelor Mittal Zenica (steel plant), distribution at Sarajevo Gas (40%) with the remaining part corresponding to 3 smaller distribution companies.

Total gas consumption in BiH was 0.36 Bcm in 2006, whereas according to forecasts for the periods 2008-2010, an increase is expected as shown in the graph below:

---

8 Srbijagas imported small quantities of peak gas from MOL, Hungary in 2006, 2007 and 2008
For the period 2010-2025 average growth is expected to be 6.1% while consumption is projected to top 0.8 Bcm/y in 2015, 1 Bcm/y in 2020 and 1.4 Bcm/y in 2025 (SEE Gasification Study by ECA).

3.1.1.2 Gas infrastructure

Transmission network

The system consists of a main transmission pipeline, importing gas from Gazprom, with a total length of 191 km, 16" diameter, max design pressure of 50 bar, while current working pressure is 30 bar. A new compression station on the Serbia and BiH border and/or a new pipeline are necessary for higher working pressure. There are 7 metering stations, 12 block stations and 4 cleaning stations at the transport system. The map in Figure 3 shows the main gas pipeline\(^{10}\) as well as other major transmission networks at the EnC Contracting Parties, and relevant interconnection locations (in yellow). A summary of the main features of the gas system of BiH is also presented in Table 2.

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\(^{9}\) Source: Statement on Security of Supply, EnC, May 2007

\(^{10}\) The map is not a complete representation of all the pipeline systems in the CPs but only the major trunklines
Table 2 BiH Gas System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transmission system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of transmission network</td>
<td>Km</td>
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</tr>
<tr>
<td>Transmission network per capita</td>
<td>km/mn.inhab</td>
<td>48</td>
</tr>
<tr>
<td>Section of pipelines</td>
<td>Mm</td>
<td>406.4</td>
</tr>
<tr>
<td>Projected pressure</td>
<td>Bar</td>
<td>50</td>
</tr>
<tr>
<td><strong>Distribution system</strong></td>
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<tr>
<td>Size of distribution network</td>
<td>Km</td>
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</tr>
<tr>
<td>Distribution network per capita</td>
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<td>245</td>
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<tr>
<td><strong>Import</strong></td>
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</tr>
<tr>
<td>Import Capacity</td>
<td>Mcm/h</td>
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</tr>
<tr>
<td>Max design capacity</td>
<td>Bcm/y</td>
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</tr>
<tr>
<td>Current effective capacity</td>
<td>Bcm/y</td>
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</tr>
<tr>
<td>Import volumes (*)</td>
<td>Bcm/y</td>
<td>0.38</td>
</tr>
<tr>
<td>Available capacity (*)</td>
<td>Bcm/y</td>
<td>0.36</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
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<td></td>
</tr>
<tr>
<td>Annual export volume (*)</td>
<td>Bcm/y</td>
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</tr>
<tr>
<td><strong>Indigenous gas</strong></td>
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<td></td>
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<tr>
<td>Annual gas production</td>
<td>Bcm/y</td>
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</tr>
<tr>
<td><strong>Final consumption</strong></td>
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<td></td>
</tr>
<tr>
<td>Total consumption (*)</td>
<td>Bcm/y</td>
<td>0.38</td>
</tr>
<tr>
<td>Of which Russian gas (*)</td>
<td>Bcm/y</td>
<td>0.38</td>
</tr>
</tbody>
</table>

(*) South East Europe: Regional Gasification Study, Final Report, March 2008

11 Source: GTE, the European Gas Network

12 million inhabitants
Storage - Balancing

There is no gas storage facility but a potential for BH Gas (the operator in FBiH), to develop salt cavity storage is existing. Supply and demand is balanced through line pack. Need for interruptions may occur 2 or 3 days per year, in which BH Gas interrupts big industrial customers who can switch to alternative fuels.

Metering-SCADA

BH Gas has a partial SCADA system and central dispatching and control centre. Flow can be controlled via valves (manual and automatic). Gas Promet (the operator in the Republika Srpska) has no control centre and would have to rely on valve control to affect flow.

Gas losses

Issue of theft and valve leakages have been encountered in the past but as reported have now been resolved on both BH Gas and Gas Promet.

3.1.1.3 Sources of gas supply

Natural gas is imported from Russia by only one supplier through the systems of Ukraine-Hungary and Serbia (Belgrade-Zvornik pipeline). Existing long-term contracts for transport of gas as the follows:

- With MOL for transport of 0.6 Bcm/y until 2018 through Hungary
- With Srbijagas for transport of 0.6 Bcm/y until 2017 through Serbia

3.1.1.4 Transit pipelines

There are no transit pipelines.

3.1.1.5 Interconnections with other gas systems

Interconnection point

<table>
<thead>
<tr>
<th>Name</th>
<th>From TSO</th>
<th>To TSO</th>
<th>Max technical capacity (Mcm/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zvornik</td>
<td>Srbijagas</td>
<td>BH-Gas</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Currently there is only one interconnection with the Serbian gas system, at Sepak. Capacity at the interconnection point is the same as for the system i.e. 700 Mcm/year effective. The load factor of this interconnection is in the range of about 50%. The flow of gas is highly season dependent and significant variations throughout the year are encountered with the maximum month 3.5 times the minimum month.

Delivery problems are related to pressure reduction from the Serbian system during peak days. Those are attributed to upstream bottlenecks at the Ukraine-Hungary border, however it should be noted that MOL plans to increase the capacity at the Hungarian side.

The border Metering Station is operated by Gas Promet. Readings are made on a daily basis (at 8.00 a.m.) by Gas Promet and information is relayed to BH Gas and Srbijagas.
Monthly readings are taken by representatives from all 3 entities. BH Gas has a metering station at Kladanj where its system begins.

**Interconnection Agreement**

There is no effective Interconnection Agreement. BH Gas has a transportation agreement with Srbijagas – buying gas from Gazprom at the Ukraine/Hungary border – for transit (which also covers the Gas Promet system in Republic Srpska), while Gas Promet has “metering” agreement with Srbijagas. In addition, there is an “implicit” transportation agreement between Serbian TSO and Gas Promet. Namely BH Gas pays Srbijagas for transportation and Srbijagas pays a proportion of this to Gas Promet.

### 3.1.1.6 Expansion plans

The following expansion projects are planned:

- New connection with Croatia through a pipeline from the existing system in Zenica to Bosanski Brod, with an approximate length of 120 km and capacity of 1 to 1.5 Bcm/y. This project would allow new input of natural gas and, on a long-term basis, a possibility for diversification of sources connecting the transport systems of BiH and Croatia.

- The construction of the gas network as well as expansion of the existing gas network into the region of municipalities of Zvornik and Sarajevo. An expansion project in Republika Srpska is planned to be constructed through Semberija, Posavina and Krajina. This gas pipeline would connect the towns of Bijeljina, Brcko, Modrica, Derventa, Prijedor, Latkasi, Banja Luka, Novi Grad and on towards the towns of Ugljevik, Samac, Bosanski Brod, Doboj, Gradiska thus all major economic and urban centres shall be connected. Concession has been awarded by the Government of RS. The project would also provide expansion of the gas network towards the territory of FBiH, i.e. construction of main line from Doboj to Zenica and Tuzla, which would enable further gasification of the Federation of BiH. Technical characteristics of this pipeline are: capacity of 1.2 Bcm/y, length 300 km, length of spurs of all sections 156 km. The pipeline would be connected to the transport system of Serbia near Zvornik or Bijeljina, and later to the transport system of Croatia, which would provide diversification of supply to BiH.

- There is a need to install a compressor station in BiH in order to expand capacity, however there is difference of opinion between BH Gas and Gas Promet as to whether it should be at Zvornik or Kladanj.

- Potential projects also include an additional new entry point, at the southern border near Mostar (dependent on TP or IAP) and possibly a separate system entry at the western border.

Ultimately it appears that the system expansion may depend more on additional capacity being available through Serbia, possibly as a result of Nabucco and/or South Stream.

### 3.1.1.7 Tariffs

Prices are dictated by the contract with the supplier (from the Russian Federation), by transport (through Ukraine, Hungary and Serbia) expenses and distribution expenses. No access tariffs are available.

Transportation tariff is embedded in the wholesale price that BH Gas charges the distribution companies and large industrial customers. Prices to large industrial customers
are negotiated. End user prices are currently regulated by the Ministry and by local authorities. BH Gas must justify all elements of this charge – gas price paid to Gazprom, transit costs in Hungary and Serbia and its own transportation and supply margin.

The main consumer of natural gas is Canton Sarajevo and the retail tariffs in January 2008 (per Nm$^3$– including tax) were (in EURO/Nm$^3$)$^{13}$:

### Table 3 Gas Tariffs in BiH

<table>
<thead>
<tr>
<th>Consumers categories</th>
<th>Historic Prices</th>
<th>Distribution Price</th>
<th>Selling Price</th>
<th>VAT</th>
<th>Final Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households</td>
<td>0.261</td>
<td>0.031</td>
<td>0.291</td>
<td>0.050</td>
<td>0.341</td>
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<tr>
<td>DH</td>
<td>0.261</td>
<td>0.036</td>
<td>0.297</td>
<td>0.051</td>
<td>0.347</td>
</tr>
<tr>
<td>Big consumers</td>
<td>0.261</td>
<td>0.118</td>
<td>0.378</td>
<td>0.064</td>
<td>0.443</td>
</tr>
<tr>
<td>Small consumers</td>
<td>0.261</td>
<td>0.123</td>
<td>0.383</td>
<td>0.065</td>
<td>0.449</td>
</tr>
<tr>
<td>Special consumers</td>
<td>0.261</td>
<td>0.063</td>
<td>0.324</td>
<td>0.055</td>
<td>0.379</td>
</tr>
</tbody>
</table>

#### 3.1.2 Croatia

**3.1.2.1 Gas market size**

Croatia has had a natural gas market for almost 50 years. Gas production started in 1959, whereas imports from Russia commenced in 1978 and at present are around 1.1 Bcm/y. In 2007 domestic gas production was 2.3 Bcm/y produced from 20 onshore and 5 offshore fields, covering about 75% of total demand. The largest quantities come from Molve and Kalinovac, where central gas plants for gas processing and transport preparation have been built – Molve I, II and III, with installed capacities of 1.3 and 5 Mcm/day. Annual gas consumption in 2007 was above 3 Bcm/y. The table below outlines the Croatian Gas market:

### Table 4 Croatia Gas Market (in Mcm/y)$^{14}$

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic production</td>
<td>1,659</td>
<td>2,010</td>
<td>1,220</td>
<td>2,190</td>
<td>2,198</td>
<td>2,283</td>
<td>2,032</td>
<td>2,355</td>
</tr>
<tr>
<td>Imports</td>
<td>1,108</td>
<td>1,083</td>
<td>1,084</td>
<td>1,139</td>
<td>1,054</td>
<td>1,134</td>
<td>1,058</td>
<td>1,055</td>
</tr>
<tr>
<td>Gas consumption</td>
<td>2,705</td>
<td>2,834</td>
<td>2,001</td>
<td>2,885</td>
<td>3,009</td>
<td>2,909</td>
<td>2,615</td>
<td>3,090</td>
</tr>
</tbody>
</table>

Out of the 3 Bcm/y consumed in 2007, about 1.2 Bcm corresponded to gas distribution companies and 1.9 Bcm, to customers connected to the transmission system, of which Petrokemija and Kutina received 646 Mcm/y, and HEP d.d. (power generation) 860 Mcm/y. A breakdown of gas utilization for the last 8 years is presented in the graph below:

---

$^{13}$ Source: ECRB, National Report BOSNIA AND HERZEGOVINA, Ref: ECRB-S-Version 4, 4 September 2008

$^{14}$ Sources: Statement of SoS, 2006, ECRB, National Report Croatia_05-09-2008-Final Draft
Study on Improvement of Interconnection, Interoperability, Transparency and Harmonisation of Operational Rules for NG Transportation in the Energy Community

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Figure 4 Breakdown of Gas Utilisation in Croatia

(Source: Statement of SoS, 2006)

Table 5 Croatia Gas Market Forecasts

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2007)</td>
<td>Bcm/y</td>
<td>3.09</td>
</tr>
<tr>
<td>Gas demand forecast 2010</td>
<td>Bcm/y</td>
<td>4.2</td>
</tr>
<tr>
<td>Gas demand forecast 2015</td>
<td>Bcm/y</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Projected gas demand has been expected to rise up to a level of 4.8 Bcm/y in 2020 and 5.7 Bcm/y in 2015 (ECRB). Particularly for the period from 2007-2010, the increase will be significant and taking into account reduction in indigenous production, there will be a considerable shortage of gas by 2010, as illustrated in the following Table.

Table 6 Croatia Demand Forecasts

<table>
<thead>
<tr>
<th>Figures in Mcm/y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
</tr>
<tr>
<td>2009</td>
</tr>
<tr>
<td>2010</td>
</tr>
</tbody>
</table>

(Source: Statement of SoS, 2006)

3.1.2.2 Gas infrastructure

Transmission System
The transmission system comprises main and regional pipelines with a total length of 2,085 km, from which 1,659 km are 50 bar and 462 km are 75 bar. There are 151 exit metering and reduction stations with 245 metering points and 19 entry metering stations.

16 Source: SoS statement, June 2006
At the moment, there are no compressor stations on the system. The total theoretical capacity of the transportation system is 2 Mcm/h.

Regarding distribution, there are 38 natural gas distribution companies in the Republic of Croatia and the total gas pipeline length amounted to 17,426 km in 2007. Total input capacity of the system is 860,000 Nm³/h.

Some key figures of the gas system infrastructure of Croatia are presented at the table below:

---

17 Source: Plinacro (2008)
Table 7 Croatia Gas System Information

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of transmission network</td>
<td>km</td>
<td>2085</td>
</tr>
<tr>
<td>Transmission network per capita</td>
<td>km/mn.inhab</td>
<td>474</td>
</tr>
<tr>
<td>Distribution system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of distribution network</td>
<td>km</td>
<td>17426</td>
</tr>
<tr>
<td>Distribution network per capita</td>
<td>km/mn.inhab</td>
<td>3960</td>
</tr>
<tr>
<td>Import</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import Capacity (*) (without Pula)</td>
<td>Mcm/h</td>
<td>0.2</td>
</tr>
<tr>
<td>Import Capacity (*)</td>
<td>Bcm/y</td>
<td>1.84</td>
</tr>
<tr>
<td>Import volumes (**)</td>
<td>Bcm/y</td>
<td>1.06</td>
</tr>
<tr>
<td>Available capacity</td>
<td>Bcm/y</td>
<td>0.78</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual export volume</td>
<td>Bcm/y</td>
<td>0</td>
</tr>
<tr>
<td>Indigenous gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual gas production</td>
<td>Bcm/y</td>
<td>2.35</td>
</tr>
<tr>
<td>Final consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total consumption (*)</td>
<td>Bcm/y</td>
<td>3.09</td>
</tr>
<tr>
<td>Of which Russian gas (**)</td>
<td>Bcm/y</td>
<td>1.06</td>
</tr>
</tbody>
</table>

(*) South East Europe: Regional Gasification Study, Final Report, March 2008

Storage - Balancing

An Underground Gas Storage (UGS) site exists in Okoli (depleted gas field), which was built in 1987 and has a capacity today of 0.558 Bcm/y. 50 Mcm is reserved for the Slovenian based Geoplin company. The maximum daily compression capacity amounts to 3 Mcm/day, and the maximum capacity of production is 5.8 Mcm/day. The maximum hourly compression capacity is around 200,000 m³. The working cycle of the storage consists of:
- 160 withdrawal days (October- April) 20,000-240,000 m³/h
- 200 days of gas injection (April-October) 30,000-160,000 m³/h

Maximum pressure in storage is 196 bar and minimum pressure at wellhead during withdrawal is 50 bar.

This site implies a higher level of security of supply for Croatia compared to other Contracting Parties.

Balancing criteria are currently negotiated between the TSO and INA, which is pending to revision within the harmonisation with Regulation 1775/2005/EC. INA which is the sole importer as well as owner of the gas storage system, is responsible for balancing the system, whereas Plinacro’s National Dispatching Centre is responsible for nominating injections and withdrawals depending on existing and anticipated conditions (linepack, pressures) in the system. For larger imbalances INA has recourse to re-nominating flows from/to suppliers and customers.

SCADA-metering

Turbine flow meters are being used for measuring gas flow rates. Correction to standard conditions is being performed by associated electronic volume corrector or flow computers.
taking into consideration measured gas temperature, measured absolute pressure and average gas composition. At two entry points, underground gas storage and one exit station, flow computers are connected to on-line chromatograph. Measurement of delivered quantities on an hourly basis is performed at all exit metering points. The installation of a remote reading system of all metering stations is in progress and expected to be completed in 1 year.

The National Dispatch Centre is equipped with a SCADA system (2006), used to monitor, in real time, the most important entry-exit points covering about 95% of transported gas. All relevant nodal points of the transport network as well as all block stations of the newly constructed system (75 bar) are included.

Gas Losses

In compliance with Ordinance on acceptable level of technical loss in process of production of oil and gas (OG no. 72/1999) and Regulations on acceptable losses on stored products (OG no. 57/1998, 81/2002 and 203/2003), acceptable losses are up to 1.5%. In the practice they are in the area of 0.2 to 0.5%.

3.1.2.3 Sources of gas supply

As of 2007, 69% of gas consumption is indigenous, coming from the Pannonian and the North Adriatic fields and the remaining 31% is imported from Russia, supplier being Gazprom. Gas is transported through the systems of Ukraine-Slovakia (Velke Kapusany)-Austria and Slovenia.

As a new option Croatia plans to develop an interconnection with Hungary. The new interconnection point will be at Donja Miholac, whereas gas will be measured at Beregovo metering station on the Ukrainian side of the Ukrainian-Hungarian border.

3.1.2.4 Transit pipelines

There are no operating gas transit pipelines in the Croatian system. However, transit can be viewed as potential only, as there are two interconnections: to the Slovenian transmission system at Rogatec and to the North Adriatic gas fields operated by INAGIP (joint venture between Croatian INA and Italian ENI), where gas production has been shared based on Production Sharing Agreement.

3.1.2.5 Interconnections with other gas systems

Interconnection points

<table>
<thead>
<tr>
<th>Name</th>
<th>From TSO</th>
<th>To TSO</th>
<th>Max technical capacity (m³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rogatec</td>
<td>Geoplin Plinovodi</td>
<td>Plinacro</td>
<td>210,000</td>
</tr>
</tbody>
</table>

The “technical capacity” of 210,000 m³/h shown at Rogatec is in fact the contractual value under the contract between INA and the Slovenian TSO. Since a compression station is very close to the border it has been noted that additional demand could be provided
through increasing network pressure (according to Plinacro the theoretical capacity can exceed 373,000 m³/day capacity).

Capacity utilisation over the last years ranges between 74% and a peak of 99%, though it reduced substantially in 2007 as shown in the following graph:

**Figure 6 Capacity Utilization at Rogatec**

Regarding the latter point it must be stressed that since 2006 the Croatian network is also interconnected with Italy’s upstream pipelines in the Adriatic, and is directly fed from Croatian Adriatic fields through the beach terminal in Pula and the new Pula-Karlovac pipeline. It should be noted that some gas fields in the Adriatic are joint venture projects involving INA and ENI. Normal operation is for ENI share of production to be delivered by offshore pipeline to Italy and INA’s share is delivered to Pula. Croatian gas can be delivered to Italy and then returned to Croatia via an alternative pipeline route.

Capacity of Pula input point is 0.17 Mcm/h. Typical flow rates at Pula are about 36% of the technical capacity which leaves space for new offshore production fields to be tied in.

**Interconnection Agreements**

There is still no Interconnection Agreement between two TSOs because INA Plc. is the only user of entry capacity and bearer of the Agreement with the neighbouring operator. The only contractual agreement in respect of Rogatec is between INA and the Slovenian TSO. Allocation rules are not known but it is understood that they are on a negotiated basis, covering both imported Russian gas and repurchase of gas from Italy as a swap from gas directed to Italy from the North Adriatic Croatian gas.

Because of the above situation, it has been noted that despite allegations that capacity is fully booked until 2017, Plinacro has not been in the position to confirm this fact.

---

An Interconnection Agreement would be needed in the event of any third party transportation service being requested at Rogatec.

### 3.1.2.6 Expansion plans

Growing demand has increased the needs for new investments and expansion of the present system. Expansion projects are in accordance with the approved plan of development, construction and modernisation of the gas transmission system in the Republic of Croatia from 2002 to 2011. The second development-investment cycle of this plan, covering the period 2007-2011 includes the following major projects:

- Gas pipeline system Slobodnica – Donji Miholjac – Dravaszerdahely (Hungary) DN 800/75 capacity ~ 6.6 Bcm/y
- Gas pipeline system Bosiljevo – Split – Ploče (DN 800/75 capacity ~ 7.5 Bcm/y) with planned extension to the Croatian-Montenegro border, through Montenegro to Fieri in Albania (Ionian Adriatic Pipeline Project) – IAP DN 1000/75 capacity ~ 10 Bcm/y. It should be noted that the construction of IAP, which will allow for the diversification of gas supply, as well as transportation, started in 2007.
- Gas pipeline system Lučko-Zabok-Rogatec (Slovenia) DN 700/75 capacity ~ 5 Bcm/allowing an increase of capacity from Slovenia, and hence reinforcement of interconnection with the rest of Europe.
- A decision has been also made by the government on the location of the future LNG Terminal (Omišalj, Krk). Croatian companies will have up to 25% interest in the LNG plant though how that will be split between them remains to be negotiated. A feasibility study is in progress. Entry into service is expected in 2012 with a capacity of up to 10 Bcm/y.

The above initiatives are expected to increase the total length of the transmission system to 3,081 km, add 25 exit points and expand the capacity to 1,200,000 m³/h.²⁰

### 3.1.2.7 Tariffs

The tariff is a relatively simple postage stamp system. The methodology for tariff calculation is defined by HERA. Capacity is defined as booked capacity by network users for each period, but it is later revised after the actual peak. TSO calculates tariffs which are then approved by the Ministry following an opinion by HERA. The final settlement is carried out by the TSO for each user until 31st of January of the next year at the latest. Gas transmission tariffs during the last years are shown below.²⁰

<table>
<thead>
<tr>
<th>Tariffs (HRK/m³/day)</th>
<th>2005</th>
<th>2006</th>
<th>2007 – 29.2.2008</th>
<th>(since 1.3.08)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak (Nov-Feb)</td>
<td>3.61</td>
<td>3.463</td>
<td>3.463</td>
<td>4.99</td>
</tr>
<tr>
<td>Medium (Mar-Jun, Sep-Oct)</td>
<td>3.008</td>
<td>2.886</td>
<td>2.886</td>
<td>4.16</td>
</tr>
<tr>
<td>Basic (Jul-Aug)</td>
<td>1.805</td>
<td>1.731</td>
<td>1.731</td>
<td>2.49</td>
</tr>
</tbody>
</table>

²⁰ Source, Ministry of Economy, 3rd Gas Forum, October 2008
²⁰ Source: ECRB, National Report, Croatia, September 2008
3.1.3 FYROM

3.1.3.1 Gas market size

Gas market in FYROM has operated since 1998 and is quite limited. Despite the increase of gas consumption from 19 Mcm/y in 1998 to 102 Mcm/y in 2007, the gas share in TPES is still just 2.3%.

Gas consumers at present consist of two District Heating (DH) companies and industrial consumers in the regions of Skopje, Kriva Palanka, Kratovo and Kumanovo. DH accounts for about 50% of gas consumption (50 Mcm/year) serving 50,000 residential and 2 to 3,000 commercial customers. Installed capacity is about 500 MWth.

Even the industrial customers use gas mostly for heating. There is a significant seasonal variation in gas consumption since most of the gas is for heating purposes during winter. Some key figures on the gas market size of FYROM are:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2007)</td>
<td>Bcm/y</td>
<td>0.102</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>0.4</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>0.6</td>
</tr>
<tr>
<td>Gas demand forecast 2020 (*)</td>
<td>Bcm/y</td>
<td>0.8</td>
</tr>
<tr>
<td>Gas demand forecast 2025 (ECA study)</td>
<td>Bcm/y</td>
<td>1.2</td>
</tr>
<tr>
<td>2010-2025 average annual Growth (ECA study)</td>
<td>%</td>
<td>3.8</td>
</tr>
</tbody>
</table>

(* ) Gas Survey, ECRB, February 2008

3.1.3.2 Gas infrastructure

Transmission system

The gas system covers a small portion of the territory, consisting of a 98 km main pipeline, branches of 26 km and a city network of 31.5 km. The diameter of transmission line is 530 mm. The nominal pressure is 54 bar, but due to the low level of gas consumption, the current pressure is 42 bar.

Capacity of the system is 0.8 Bcm/year with the use of one compression station (CS) on the Bulgarian side, which is not fully used (only 15%). With the utilization of the 2nd CS capacity can reach 1.2 Bcm/year. Lack of distribution systems on local level does not allow the utilisation of the available capacity. Toplifikacija AD-Skopje is the biggest user of natural gas.

Nevertheless expansion plans have been developed and consumption is expected to grow significantly within the next two decades, including gas distribution networks and two new CHP stations – one planned for 2009 and one for 2012 or 2013. With those CHP stations full capacity is expected to be utilized.

Main features of the present infrastructure and capacities are shown in the table below:
Table 9 FYROM Gas Infrastructure and Capacities

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transmission system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of transmission network</td>
<td>km</td>
<td>98</td>
</tr>
<tr>
<td>Transmission network per capita</td>
<td>km/mn.inhab</td>
<td>48</td>
</tr>
<tr>
<td><strong>Distribution system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of distribution network</td>
<td>km</td>
<td>52</td>
</tr>
<tr>
<td>Distribution network per capita</td>
<td>km/mn.inhab</td>
<td>25</td>
</tr>
<tr>
<td><strong>Import</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import Capacity (*)</td>
<td>Mcm/h</td>
<td>0.1</td>
</tr>
<tr>
<td>Import Capacity (*)</td>
<td>Bcm/y</td>
<td>0.8</td>
</tr>
<tr>
<td>Import volumes (*)</td>
<td>Bcm/y</td>
<td>0.08</td>
</tr>
<tr>
<td>Available capacity</td>
<td>Bcm/y</td>
<td>0.072</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual export volume</td>
<td>Bcm/y</td>
<td>0</td>
</tr>
<tr>
<td><strong>Indigenous gas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual gas production</td>
<td>Bcm/y</td>
<td>0</td>
</tr>
<tr>
<td><strong>Final consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total consumption (*)</td>
<td>Bcm/y</td>
<td>0.08</td>
</tr>
<tr>
<td>Of which Russian gas (*)</td>
<td>Bcm/y</td>
<td>0.08</td>
</tr>
</tbody>
</table>

(*) South East Europe: Regional Gasification Study, Final Report, March 2008

SCADA-metering

There is one main metering station at the border with Bulgaria (in Zidilovo), five GMRS main metering regulations station (in Kriva Palanka, Kratovo, Kumanovo and two in Skopje) and about thirty metering regulation stations for consumers, connected with the Deve Bair 98 km pipeline capacity: 1,2x10⁹ m³/a
transmission system. The border MRS has been installed recently (3 years ago) and is quite sophisticated, incorporating ultrasonic metering. Gas quality is monitored regularly (with representative from Gazprom). Distance of the metering station from the border is 8 km. There is no GMRS at the Bulgarian side.

There is no remote metering but plans to install a relevant system have been initiated. In general, investments for the upgrading of the gas system that have been planned are:

- Refurbishment of 15 low pressure stations in Skopje and increase of their capacity
- Reconstruction of the 3rd metering line at the border station. Now there is one operational line plus a spare, however the obligation is for 2+1 operational line
- Installation of SCADA which will allow also for the calculation of unaccounted gas losses.

Those projects will be completed by 2010. Budget has already been allocated.

Storage – Balancing

No gas storage installation exists and no plans to construct one have been reported. At present balancing is made only through linepack. Tolerance limits are at high levels due to lack of congestion.

Gas Losses

Despite a technical limit of 0.3%, losses are estimated to be in the order of 1%, due to aged equipment, particularly leaking valves. In addition, measurement accuracy is not at an optimal level. Whilst at the border uncertainty is just 0.2-0.5% downstream measurement uncertainty levels are significantly higher (1-2%), therefore improved downstream metering is needed.

3.1.3.3 Sources of gas supply

Gas has been supplied to FYROM via pipeline from Russia (capacity 1.2) through Ukraine, Moldova, Romania and Bulgaria. All of the consumption is subject to long-term contract which is adjusted on an annual basis. Gas is delivered by Gazprom at the Bulgarian border.

3.1.3.4 Transit pipelines

There are no existing transit pipelines.

3.1.3.5 Interconnections with other gas systems

Interconnection point

There is a single interconnection point with the Bulgarian system, through a single gas transmission pipeline, at Zidilovo.

<table>
<thead>
<tr>
<th>Name</th>
<th>From TSO</th>
<th>To TSO</th>
<th>Max technical capacity (Mcm/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidilovo</td>
<td>Bulgartransgaz</td>
<td>GA.MA.</td>
<td>0.11</td>
</tr>
</tbody>
</table>
No interruptions are encountered since gas consumption is significantly lower than the overall capacity. However in some occasions during peak gas usage in Greece during winter, pressure falls but this problem will be fixed shortly through the utilisation of the 2nd CS in Bulgaria.

Interconnection Agreement

There is no Interconnection Agreement. Makpetrol who buy gas on the border, signs annual contracts with contract with Gazprom for trade of natural gas.

3.1.3.6 Expansion plans

Several expansion projects are being planned by the Government aiming to interconnect with the main gas pipelines in the region and increase the use of natural gas for electricity production. The most important are:

- New CHP thermal power stations: 1. CHP plants: TE-TO will have a capacity of 220 MW and 160 MWth to be finished in 2009. ELEM plant, located at a steel industry, is under the government. Its capacity will be approximately 300 MW and 300 MWth. Completion is expected for 2012-2013. Contracts for the connection of the pipelines for those projects have been signed.

- Gas pipeline: Klecovce–Veles–Stip–Negotino (DN 500). The project presents a plan for further completion of the secondary pipeline network and supply gas to several towns: Sveti Nikole, Veles, Shtip, Kochani, Gradsko, Demir Kapija, Negotino and Kavadarc. The total length will be 101 km, capacity is 286 Mcm/y with additional 400 Mcm/y if TPP Negotino is connected to the system. The total costs are estimated to be US$40 million. The project was designed with a primary target to supply gas to a 210 MW power plant built to serve a local Nickel production industry. However following the change of ownership of the latter, this may not be feasible anymore.

- Gas pipeline (DN 300) and gas distribution in Tetovo. It is the missing infrastructure from the Energy Community Gas Ring in the territory of FYROM and an extension pipeline of the main transmission line from Skopje to the Albanian border with connection branches towards Debar, Struga and Ohrid. Length of the pipeline is 48 km, annual consumption 0.35 Bcm/y and cost around US$20 million.

- Gas ring around Skopje, Implementation depends on the connection to the 3rd DH plant of Skopje, which currently is not gasified. This plant is located about 10 km from the existing pipeline.

- New Pipelines to Albania (DN 700) (this is a transit with entry at Strumica), UNMIK (DN 100) and Serbia (DN 300) are also under consideration. The latter is noted to be an important expansion project, constituting part of the EC Ring and allowing a potential supply from Serbia through counter flow.

- Expansion of MMRS Skopje North and MMRS Skopje South with capacity rising

- Modernization of the third line on MMS Zidilovo

In addition feasibility studies for gas distribution in several cities have also been made (Skopje, Kriva Palanka, Tetovo etc.) but no further progress is recorded.

For all the major new pipeline projects there are no actual plans for implementation. The pre-feasibility or feasibility studies for them have been performed several years ago (20-25), but as no further progress has been encountered since then, the scope of many of those studies is not relevant any more. Decisions are mostly dependent on the Ministry of
Economy. Relevant important studies that would enable technically sound and viable expansion projects are: the New Energy Strategy to be finished in 2009 and a new feasibility study for the development of natural gas in the country which has been launched (open tender) and is expected to start soon.

3.1.3.7 **Tariffs**

Tariffs for transmission, supply and total price for natural gas are regulated and set by the Energy Regulatory Commission (ERC). The import price applies at the border with Bulgaria. The transmission price is based on principle of “postage stamp”.

Given the small size and lack of congestion, supply regulation is very simple. The allowed tolerance limits for transmission contracted quantity of natural gas are +/- 30%. If a shipper (supplier or eligible customer) transports at least 30% more than the contracted quantity of natural gas per year, the transmission tariff is increased by 1%. If the shipper transports 70% or less of the contracted quantity of natural gas per year, he must pay 70% of contracted quantity per year.

The quarterly sales prices for natural gas for the tariff customers connected to the transmission grid are (without VAT 18%)²¹:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
</tr>
</tbody>
</table>
| Import price of natural gas - \(P_{\text{imp}}\) (€/nm\(^3\))  
(with included customs and other duties) | 0.224 | 0.208 | 0.209 | 0.228 | 0.260 | 0.274 | 0.319 |
| Regulated maximum price for supply service for the tariff customers connected transmission grid - \(P_{s}^\text{max}\) (€/nm\(^3\)) | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| Regulated maximum price for transmission service of natural gas - \(P_{t}^\text{max}\) (€/nm\(^3\)) | 0.036 | 0.036 | 0.036 | 0.036 | 0.036 | 0.036 | 0.036 |
| Sales price for natural gas without VAT - \(P_{s}\) (€/nm\(^3\)) | 0.263 | 0.247 | 0.248 | 0.267 | 0.299 | 0.313 | 0.356 |

Prices for transport, distribution and supply with natural gas are regulated by applying the methodology based on incentive price regulation by the price cap method. The Rulebook on the method and conditions for regulating prices for transport, distribution and supply with natural gas has been published in 2005, followed by the tariff system for transport of natural gas and the tariff system for selling natural gas to tariff customers. The total charge that tariff customers directly connected to the natural gas transportation system pay consists of two components: the selling price and the price for the service transport and operation of the natural gas transportation system. The applied methodology enables covering all costs and ensures a level of regulated return of capital.

3.1.4 Serbia

3.1.4.1 Gas market size

Though having one of the most developed gas markets in the region, gas usage in Serbia is relatively limited and currently used mainly in industry. Share of gas in primary energy and power generation is not very high though an increase is expected in near future.

Annual consumption is in the range of 2.3 bcm/y. Domestic production is 8% of total consumption and has declined over the past few years. The consumption profile is characterized by a very high peak demand in winter. This leads to the situation that the main problem in managing and expanding infrastructure is to provide for peak capacity requirements. The figure below presents the annual demand profile:

Key figures of natural gas infrastructure and market size in the Republic of Serbia are:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2007) (**)</td>
<td>Bcm/y</td>
<td>2.3</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>3.1</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>3.5</td>
</tr>
<tr>
<td>Gas demand forecast 2020 (*)</td>
<td>Bcm/y</td>
<td>Na</td>
</tr>
<tr>
<td>Gas demand forecast 2025 (ECA study)</td>
<td>Bcm/y</td>
<td>3.6</td>
</tr>
<tr>
<td>2010-2025 average annual Growth (ECA study)</td>
<td>%</td>
<td>1.9</td>
</tr>
</tbody>
</table>

(*) Gas Survey, ECRB, February 2008  

The breakdown of the natural gas consumption per sector in Serbia (2007) is:

- 24% power generation (557 Mcm/y), mainly for district heating plants (467 Mcm/y)
- 57% industrial and non-energy uses (1338 Mcm/y)
- 19% residential, commercial and transport (443 Mcm/y)
3.1.4.2 Gas infrastructure

Transmission System

The transmission system of Serbia started to develop in 1960. Currently it comprises high pressure pipelines of a total length of 2140 km. With a total transmission capacity of 540,000 m³/h. Main elements of the gas infrastructure are shown in the table below:

Table 11 Serbia Gas Infrastructure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of transmission network</td>
<td>Km</td>
<td>2140</td>
</tr>
<tr>
<td>Transmission network per capita</td>
<td>km/mn.inhab</td>
<td>275</td>
</tr>
<tr>
<td>Distribution system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of distribution network</td>
<td>Km</td>
<td>10500</td>
</tr>
<tr>
<td>Distribution network per capita</td>
<td>km/mn.inhab</td>
<td>1310</td>
</tr>
<tr>
<td>Import</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import Capacity (*)</td>
<td>Mcm/h</td>
<td>0.5</td>
</tr>
<tr>
<td>Import Capacity (*)</td>
<td>Bcm/y</td>
<td>6.1</td>
</tr>
<tr>
<td>Import volumes (*)</td>
<td>Bcm/y</td>
<td>2.53</td>
</tr>
<tr>
<td>Available capacity</td>
<td>Bcm/y</td>
<td>3.57</td>
</tr>
<tr>
<td>Exports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual export volume</td>
<td>Bcm/y</td>
<td>0.38</td>
</tr>
<tr>
<td>Indigenous gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual gas production (**)</td>
<td>Bcm/y</td>
<td>0.26</td>
</tr>
<tr>
<td>Final consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total consumption (**)</td>
<td>Bcm/y</td>
<td>2.3</td>
</tr>
<tr>
<td>Of which Russian gas (2007)</td>
<td>Bcm/y</td>
<td>2.1</td>
</tr>
</tbody>
</table>

(*) South East Europe: Regional Gasification Study, Final Report, March 2008

Source ECRB, National Report, Serbia, September 2008
Figure 7 Serbian Gas Transportation System

Source: Srbijagas

23 Source: Srbijagas
Storage

Until present there has been no gas storage facility, however an UGS site at Banatski Dvor is in process of construction. The aim of this installation is to hold about 1/3 of annual demand as storage and allow a flat import profile during the year and therefore decrease import and transit costs. Maximum storage capacity is expected to be 800 Mcm.

In terms of the progress of this project, the gas preparation process (capacity of 3.7 Mcm/day) has been finished, the compressor facilities (1.3 Mcm/day) are functioning and more than 100 Mcm has been injected for cushion gas purpose, whilst the first withdrawal is expected during the heating season 2008/2009, with a capacity of 0.5 Mcm/day and quantity of about 20-30 Mcm.

In addition, the production line for preparation, drying and dispatch of the stored natural gas into the gas transmission system is under construction (5 Mcm/day planned capacity). The 42 km long double gas pipeline Gospodjinci-Banatski Dvor is also under construction.

SCADA-metering

Natural gas volume is measured with validated and checked metering devices. At most places metering data are corrected to standard conditions by the metering device itself. Final data from some (a minority) of the metering stations are transferred to central control location by telemetry, which cover about 70% of quantity/year. There is lack of meters in several Main Metering and Regulation Stations (MMRS). There is a programme to install meters at those points and the problem is expected to be resolved by 2009.

New SCADA system for commercial purposes is expected to be implemented with funds from IPA in 2009. The IT systems are planned to be in place by 2011.

Balancing

There is considerable seasonal variation in demand, and the swing on Russian contracted imports is used for balancing demand and supply. There are no Take or Pay penalties, only Ship or Pay for transit. 110% is the swing on domestic production. Additional swing is provided through peak supply contracts with MOL in Hungary.

 Interruption of 5 major industrial consumers is the second step in periods with peak demands (usually in winter days with temperature below 0°C). Line-pack variation is used mostly for balancing on an hourly level. Volume at operating pressure of line-pack is 240,000 m³/bar. Possibility to increase domestic production is limited to 0.05 Mcm/day.

The new storage facilities will obviously greatly improve and add to balancing options.

Gas Losses

Historically transmission and distribution were vertically integrated and meters were not installed at the all offtakes and losses have been determined based on quantities estimated by gas transmission and metered quantities at appropriate medium pressure networks. According to estimations by Srbijagas, the losses of natural gas transmission in 2007 amount to 1%.

The programme to install meters is in hand and close to being completed. 90% of daily meters will be installed until the end of 2010.
3.1.4.3 Sources of gas supply

At the moment the only gas sources for Serbia are from its own gas fields in Vojvodina (partly), and mostly import from Russia via Hungary and Ukraine (Beregovo metering station). In 2007, import of gas amounted to 92% of the total consumption, almost all of which originates from Russia (Gazprom), while a very small part (less than 1%) is imported from Hungary in order to meet the peak consumption.

The contract on transit through Hungary is a long term contract, which expires in 2017, but the needed capacity is defined every year. Allowed flexibility is ± 10%. Necessary capacities in winter period are additionally charged. Srbijagas has a long term contract for transit to BiH (1998-2017), but modifications are being made every year.

Capacity arrangements currently in place are:

1. Contracted capacity = $1.1 \times \frac{Q_{\text{year}}}{365(366)}$, ship or pay obligations. $Q_{\text{year}}$ should be defined 5 years in advance. Value of $Q_{\text{year}}$ is 2.4 Bcm for 2008, thus contracted capacity is 7.21 Mcm/day.
2. Guaranteed capacity (from contracted capacity to 10 Mcm/day), higher price than contracted capacity should be nominated in April for next year on a monthly breakdown
3. Additional capacity (from guaranteed capacity to 11 mcm/day) used for peak supply. Sources of gas are Austrian-Hungarian border, UGS in Hungary, production in Hungary. This part corresponds to 0.5 Mcm/day as firm and 0.5 Mcm/day as interruptible capacity. Two contracts with MOL Production were signed to import gas to cover peak demands in last two winter seasons.

3.1.4.4 Transit pipelines

The pipeline transporting gas from Belgrade to BiH (Zvornik) is the only transit line in the territory of Serbia. Reserved capacity for this line is 1.85 Mcm/day.

3.1.4.5 Interconnections with other gas systems

Interconnection Points

Hungary

Total import is realized by JP Srbijagas through one entry point at the Hungarian-Serbian border:

<table>
<thead>
<tr>
<th>Name</th>
<th>From TSO</th>
<th>To TSO</th>
<th>Max technical capacity (Mcm/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiskundorozsma</td>
<td>FGSZ</td>
<td>Srbijagas</td>
<td>0.54</td>
</tr>
</tbody>
</table>

The capacity of the interconnection is 12.96 Mcm/day, with maximum contracted capacity being 11 Mcm/day for Serbia (thus about 4 Bcm/y) and 1.5 Mcm/day\(^{29}\) firm and 0.35 Mcm/day interruptible reserved for transit to BiH. Capacity utilisation was in the range of 52-54% during 2006 and 2007. There are difficulties in using more due to upstream

\(^{24}\) Source: GTE
\(^{25}\) Source: Response of Srbijagas
congestion in Ukraine-Hungary border as well as lack of flexibility tools so that capacity usage is much lower in summer, taking also into account the absence of a storage site. Hungarian TSO announced that this capacity will be increased in 2009. Only one partial supplier interruption occurred in winter 2006 (about 20 days in January and February) in last 7 years. Srbijagas has bought natural gas from Yugorosgaz and Yugorosgaz has bought natural gas Gazprom from 2007. It is a 1 year contract which is annexed in 2008 and 2009.

The metering station is located in Kiskundorzma in Hungary 10 km inside the border. Srbijagas representatives visit the meter station with MOL representatives to check readings on regular basis (every three months). The check meter is on Serbian side at the control station Horgos in Serbia 2 km from the border.

The whole supply of gas is sourced from the north which makes the whole system relatively unreliable.

A simple TSO to TSO agreement is in place with process for reading and verifying metered flows. Both at entry point from Hungary and exit point to BiH.

As already mentioned there is a connection between Serbia and BiH. The metering station is located at Zvornik. The capacity for this interconnection is 2 Mcm/day, and the contracted capacity is 1.85 Mcm/day.

Interconnection Agreement

Currently there is only one shipper in Serbia, so the industry participants did not see a need for an IA, but it is recognized that some form of IA will be needed in future. As a preliminary concept that an IA based on the shipper balancing method can be used and that could be developed to a pro-rata or OBA system as the number of shippers builds up.

3.1.4.6 Expansion plans

Options that are being considered / implemented for reinforcement-expansion of the gas system of Serbia include:

- Bi-directional gas pipeline Gospodjinci – Banatski Dvor. As a part of planned gas pipeline structure, the bi-directional gas pipeline DV 04-18 will connect the transmission node GRČ Gospodjinci with underground gas storage UGS Banatski Dvor.
- Distribution gas pipelines in the following districts: Braničevo, Kolubara and Mačva, Šumadija, Zlatibor.
- Connection of gas pipeline systems of Serbia and Croatia.
- Additional connection of gas pipeline systems of Serbia and Bosnia-Herzegovina, in the area of the Republika Srpska.
- Investments on SCADA and modernization of telemetry system at PE Srbijagas gas pipeline system.

It is understood that this upstream congestion at the Ukraine-Hungary border is being resolved.
3.1.4.7 Tariffs

Transport tariffs are of postage stamp type. Energy undertakings calculate and propose tariffs, the RA provides its opinion and issues methodologies but the final approval of the prices is given by the Government. AERS has published methodologies for the calculation of:

- Transportation systems access and use prices,
- Distribution systems access and use prices
- Natural gas prices for tariff consumers (wholesale and retail)

Tariffs for the two largest distribution companies in Serbia are given at the following table (after VAT of 8%).

<table>
<thead>
<tr>
<th>Companies / Groups of buyers</th>
<th>1/1/2007 (EUR/m³)</th>
<th>1/7/2007 (EUR/m³)</th>
<th>31/12/2007 (EUR/m³)</th>
<th>1/1/2008 (EUR/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households (D3)</td>
<td>0.313</td>
<td>0.291</td>
<td>0.290</td>
<td>0.290</td>
</tr>
<tr>
<td>Other buyers connected to the distribution network with the operating pressure lower than 4 bar (Small industry) (I1)</td>
<td>0.320</td>
<td>0.310</td>
<td>0.317</td>
<td>0.360</td>
</tr>
<tr>
<td>District Heating Systems</td>
<td>0.279</td>
<td>0.259</td>
<td>0.258</td>
<td>0.258</td>
</tr>
<tr>
<td>Industry (I4-1)</td>
<td>0.286</td>
<td>0.277</td>
<td>0.283</td>
<td>0.321</td>
</tr>
<tr>
<td>Company 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households (D3)</td>
<td>0.329</td>
<td>0.305</td>
<td>0.305</td>
<td></td>
</tr>
<tr>
<td>Other buyers connected to the distribution network</td>
<td>0.329</td>
<td>0.322</td>
<td>0.333</td>
<td></td>
</tr>
</tbody>
</table>

3.1.5 Outline of supply and demand forecasts

The Table below summarises in a comparative way the key infrastructure, market and demand forecasts for the four gasified CPs, which have been illustrated separately in the respective sub-sections.

---

### Parameter | Unit | BiH | Croatia | FYROM | Serbia
--- | --- | --- | --- | --- | ---
**Transmission system**<br>Size of transmission network | Km | 191 | 2085 | 98 | 2140
Transmission network per capita | km/mn.inhab | 48 | 474 | 48 | 275
**Distribution system**<br>Size of distribution network | Km | 975 | 17426 | 52 | 10500
Distribution network per capita | km/mn.inhab | 245 | 3960 | 25 | 1310
**Import**<br>Import Capacity | Mcm/h | 0.1 | 0.2 | 0.1 | 0.5
Max design capacity | Bcm/y | 1.05 | 1.84 | 0.8 | 6.1
Import volume | Bcm/y | 0.38 | 1.06 | 0.08 | 2.53
Available capacity | Bcm/y | 0.36 | 0.78 | 072 | 3.57
**Exports**<br>Annual export volume (*) | Bcm/y | 0 | 0 | 0 | 0.38
**Indigenous gas**<br>Annual gas production | Bcm/y | 0 | 2.35 | 0 | 0.26
**Final consumption**<br>Total consumption (*) | Bcm/y | 0.38 | 3.09 | 0.08 | 2.3
Of which Russian gas (*) | Bcm/y | 0.38 | 1.06 | 0.08 | 2.1
**Gas demand forecast 2010** | Bcm/y | 0.5 | 4.2 | 0.4 | 3.1
**Gas demand forecast 2015** | Bcm/y | 0.8 | 5.7 | 0.6 | 3.5
**Gas demand forecast 2020** | Bcm/y | 1 | NA | 0.8 | NA
**Gas demand forecast 2025 (ECA study)** | Bcm/y | 1.4 | 4.2 | 1.2 | 3.6

In addition, figure 8, presents the gas supply and demand forecast for all 7 EnC Members according to the recent SEE Gasification Study. Apparently there will be significant rise in gas demand and in parallel reduction of indigenous production by 2025 leading to a supply gap, signifying a definite need for new investments in the region.
Figure 8 Demand and Supply Forecasts for Contracting Parties

Source SEE Gasification Study
3.2 REGULATORY SYSTEMS

This section comprises an analysis on the gas regulatory regime of all 7 EnC CPs. As an introductory note we should quote the Deadlines for implementation of the EC legislature according to the Energy Community Treaty:

- Directive 2003/55/EC to be implemented by 1st July 2008
- Regulation 1775/2005/EC by 31st December 2008

It should be noted that though Members of the Energy Community committed themselves to being in compliance with the EU Gas Directive within one year of accession to the Treaty, in practice, the requirements of the Directive have been difficult to meet and the process has been extended over a longer period.

3.2.1 Albania

General issues-market structure

Due to the absence of gas market the regulatory framework is at the early stages of development. The Ministry of Energy has plans to transpose EU requirements into national gas legal and technical framework, which would enable participation of Albania in the regional gas network interconnection projects. In parallel work is being done in infrastructure planning, establishment of regulatory framework and creation of gas policy.

Regulation

The Energy Regulatory Entity (ERE) shall be the responsible body for regulation of the natural gas activities except the activity of natural gas exploration and production. Organigramme of ERE is presented in Appendix 7.

Legislation - Compliance with EU Acquis

The Ministry of Economy/Trade/Energy has elaborated the Gas Law which was expected to be approved by the Government and the Parliament within June 2008, and which transposes the requirements into national gas legal/-technical framework. In parallel:
- approval procedures, preparation the for technical rules and standards has started.
- the new law takes into consideration only one Regulatory Authority for both sectors, electricity and gas (Regulatory Authority of Energy).
Table below indicates progress dimensions in Albania as of May 2008.

**Table 12 Albania: Progress on EU Acquis**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Status</th>
<th>Level of Implementation (LOI)</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public service obligation and customer protection</strong></td>
<td>Partly fulfilled</td>
<td>3</td>
<td>More detailed specifications criteria for customer vulnerability. This could be done in the market rules.</td>
</tr>
<tr>
<td><strong>Monitoring security of supply</strong></td>
<td>Instruments for the monitoring of security of supply are foreseen in the gas act.</td>
<td>3</td>
<td>Mechanisms for their practical implementation to be specified in market rules.</td>
</tr>
<tr>
<td><strong>Technical rules</strong></td>
<td>Technical rules are included.</td>
<td>2</td>
<td>More detailed mechanisms for their practical implementation, to be specified in the market rules.</td>
</tr>
<tr>
<td><strong>Unbundling provisions and access to accounts</strong></td>
<td>Provisions incorporated in the draft gas act</td>
<td>3</td>
<td>Modifications to comply fully with 2003/55/EC.</td>
</tr>
<tr>
<td><strong>Third party access</strong></td>
<td>Provisions on the TPA are available</td>
<td>3</td>
<td>Further rules to make the system operational (in the market rules)</td>
</tr>
<tr>
<td><strong>New infrastructure and exemptions</strong></td>
<td>Rules for new infrastructure have been developed (in line with Directive 2003/55/EC)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Market opening</strong></td>
<td>Relevant provisions are included</td>
<td>2</td>
<td>More details are needed.</td>
</tr>
<tr>
<td><strong>Cross border trade mechanism</strong></td>
<td></td>
<td>1</td>
<td>Compliance until the end of 2008 with Regulation 1775</td>
</tr>
<tr>
<td><strong>Regulation 1775/2005/EC</strong></td>
<td>Some provisions on tariffs for network access and TPA</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>


Scoring:
1: Bottlenecks
2: Some provisions available
3: Some provisions missing
4: All provisions available

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29 Gas sector-the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
3.2.2 Bosnia and Herzegovina

General issues-market structure

Coordination of activities in the gas sector is done by the Ministry of Foreign Trade and Economic Relations (MOFTER) and will remain so until new legislation is put into force. A key policy priority is to implement the regulatory framework in the energy sector, including the enactment of a Gas Law at the State level, since gas sector is still not regulated. Three companies own the transmission network in BiH, namely BH-Gas Sarajevo, Gaspromet Pale and Sarajevo-gas Lukavica. Regarding the two former:

- BH-Gas is the operator in the Federation of Bosnia and Herzegovina (FBiH), the sole wholesale supplier and the biggest gas carrier within BiH, operating 68% of the transmission pipeline.
- Gaspromet Pale is the operator in the Republika Srpska (RS) since the end of 2007.

There are 4 gas distributors 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%). In total, distribution customers represented 48% of total consumption in 2007.30

Regulation

Work on drafting of the legislation (Draft Gas Law) has recently commenced. Legislation for the establishment of the regulator is pending. Currently there is no gas regulator though there is a proposal to widen the responsibilities of the State Electricity Regulatory Commission (SERC) – which regulates the electricity transmission system in BiH - to include gas. The formulation and interpretation of duties of a regulatory body for gas, will be a complex task due to the highly sensitive and complex political system. Existing regulatory commissions are satisfied with their own work and reluctant to change their current status. Particular provisions implemented in the two political entities are:

- Republika Srpska (RS): the Regulatory Commission for Energy (RERS) has some responsibilities on natural gas. A Gas Law has been passed in September 2007, assigning among others the following regulatory competencies in the gas sector to RERS:
  o prescribe methodologies for calculation of costs of generation, transport, distribution, storage and supply of natural gas and calculation of costs of connection to the network;
  o establish tariff system for access and use of system for generation, transport, distribution and storage of natural gas and tariff system for supply tariff customers with natural gas;
  o grant and revoke licenses for operation in natural gas sector;
  o prescribe conditions for buyers to obtain the status of eligible buyers;
  o approve general conditions for supply and technical rules for operation of system operators;
  o dispute settlement between parties in the gas sector

30 http://www.erranet.org/AboutUs/ Members/Profiles/BosniaAndHerzegovina
According to the RS Law, as of 1/1/2008 all customers except households would be eligible, however this is more theoretical than practical since there is currently little possibility of alternative suppliers.

- **FBiH:** a gas market decree has been issued, but no Gas Law is existing. Legal unbundling between transmission and distribution is reported, but not between either of them and supply activities. There is no regulator on gas and FERK – The regulatory Commission for Electricity on FBiH - has currently no jurisdiction on natural gas.

**Market Opening**

There is no market opening yet. The law in the RS foresees the possibility for RERS to define a threshold for the status of eligible customers.

**Unbundling**

In RS activities are performed by three independent companies, one engaged in transmission and TSO, one in transmission, distribution and supply of end buyers, and one in distribution and supply.

BH Gas currently is a bundled sales and transportation operator with no shippers on the system.

**Legislation - Compliance with EU Acquis**

Primary legislation is still pending and approximation with the acquis until present has been limited.

An expert group was established in order to develop and propose the proper frame for the gas sector in BiH – in line with the requirements of the Directive 2003/55/EC. Until present progress has been slow due to complex procedure and the specific political structure. Additional efforts in the elaboration and in the implementation are required, mostly with respect to the allocation of competences of the regulatory authorities, in the authorization procedure, with regard to customer protection, in particular vulnerable customers, and unbundling requirements are urgently needed.

**Regulation 1775-Network Code**

Gas Promet has developed a draft network Code, whereas BH Gas has no Code yet, since there is no Gas Law yet in place. With regard to the Regulation 1775/2005/EC it can be stated that these requirements are being dealt with – jointly with the rules of the Directive 2003/55/EC. At present there is no TPA or capacity allocation mechanism and balancing rules will be defined in the transmission grid code.

**Training requirements**

A requirement by both BH Gas and Gas Promet there for regulatory and commercial training and assistance for the new gas industry structure, specifically related to the circumstances in BiH has been noted.

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31 ECRB, National Report BOSNIA AND HERZEGOVINA, Ref: ECRB-S-Version 4, 4 September 2008
3.2.3 Croatia

General issues-market structure

There is one producer/wholesaler/storage operator in Croatia, INA. The company, which controls 100% of the wholesale market. INA is owned by the Hungarian oil company MOL Rt (by 47,155 %), the Republic of Croatia (by 44,836 %) and institutional and private investors (own 8,009 %).

There is also one gas transport company which is the TSO, (Plinacro – legally unbundled, state owned), that was separated from INA in 2001 as a subsidiary and transferred to direct state ownership in 2002. Finally there are 38 distribution companies/public utility supply companies, 8 are joint ventures, 25 are municipal companies, 4 are privately owned, and one is state owned.

The wholesale price is set by Governmental decree whereas the eligibility level is set by the Gas Law. Market has been fully opened since 2008.

Regulation

The gas sector is regulated by the Croatian Energy Regulatory Agency (HERA). The Agency was founded in 2005 as the successor to the Energy Regulatory Council that was founded in 2002. The Agency is obliged to apply regulations to protect market competitiveness relating to energy activities and offering technical assistance to the Croatian Competition Agency. HERA has competences on licensing, methodologies for transmission tariffs, methodologies for transit tariffs and dispute resolution. It monitors market rules but does not issue them. This is done by the Ministry. An organigram of the Agency is presented in Appendix 7.

Market Opening

From 1 August 2007 all non households are eligible customers whereas from 1 August 2008 there is full liberalisation of the gas market, however the wholesale supply is still entirely controlled by the same incumbent company.

Unbundling

Legal and ownership unbundling of the single TSO (Plinacro) has been effected. The TSO is under direct state control since 2002. Public service activity concerning gas transport is performed by Plinacro, hence separating transport activities from INA. Regarding DSOs, accounting unbundling has been implemented in most of them whereas legal unbundling is currently in progress.

Legislation - Compliance with EU Acquis

A Gas Market Law was introduced in 2007, harmonising the framework with Directive 2003/55, Directive 2004/67 and partly Regulation 1775 followed by several amendments. The Law clarified many details of the regulatory framework more specifically, eligibility status, market activities, regulated TPA, tariff methodologies, regulated activities that are conducted as a public service (gas transport, distribution, storage, managing the LNG terminal and supply for tariff consumers). It also regulates rules and measures for activities in the sector including LNG and determined INA as the supplier of natural gas for tariff consumers in Croatia
Secondary legislation that is in place includes:
- Grid Code for Access to the Gas Pipeline Transportation System ("Official Gazette", No. 126/03)
- Tariff system for Natural Gas Transportation ("Official Gazette", No. 32/06, 03/07)
- The Decree on Security of Natural Gas Supply ("Official Gazette", No. 112/08)

With regards to transposition of Regulation 1775 the following actions have been implemented:
- Setting of non-discriminatory rules for access conditions to natural gas transmission systems
- Tariffs (or methodologies used to calculate them) for access to the transmission network
- Establishment of the transmission system operator
- The Regulatory Authority responsible for monitoring of the implementation

At present, the following secondary legislation is being developed:
- The Rulebook on the Natural Gas Market Organisation (new)
- Grid Code for Natural Gas Transportation (new)
- Tariff system for Natural Gas Transportation (amendments)
- General Conditions for Gas Supply (new)

An outline of the progress in relation to the EU acquis is presented below:
Table 13 Croatia: Progress on EU Acquis

<table>
<thead>
<tr>
<th>Issue</th>
<th>Status</th>
<th>LOI</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service obligation and customer protection</td>
<td>Provisions on PSO are in the Gas Act.</td>
<td>4</td>
<td>More detailed specifications- could be provided for in the market rules</td>
</tr>
<tr>
<td>Monitoring security of supply</td>
<td>Provisions for the monitoring of security of supply are included;</td>
<td>4</td>
<td>More detailed rules for the practical operation of the system are needed.</td>
</tr>
<tr>
<td>Technical rules</td>
<td>Relevant technical rules are available.</td>
<td>4</td>
<td>Detailed mechanisms for their practical implementation - could be done in the market rules</td>
</tr>
<tr>
<td>Unbundling provisions and access to accounts</td>
<td>Relevant provisions are available</td>
<td>4</td>
<td>Rules for practical operation - could be provided for in the market rules</td>
</tr>
<tr>
<td>Third party access</td>
<td>Provisions are included in the legislation;</td>
<td>4</td>
<td>Rules for practical operation – to be included in the market rules to make the system operational</td>
</tr>
<tr>
<td>New infrastructure and exemptions</td>
<td>Rules for new infrastructure have been developed (in line with the Directive 2003/55/EC)</td>
<td>4</td>
<td>Rules for practical operation to be included in the market rules to make the system operational.</td>
</tr>
<tr>
<td>Market opening</td>
<td>Since August 1, 2008 all customers</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Cross border trade mechanism</td>
<td>Some provisions available</td>
<td>2</td>
<td>Compliance until the end of 2008 with Regulation 1775</td>
</tr>
<tr>
<td>Regulation 1775/2005/EC</td>
<td>Compliance on tariffs for network access and TPA</td>
<td>3</td>
<td>Particular needs on CAP mechanisms and CM, balancing rules and derogations and reporting</td>
</tr>
</tbody>
</table>


Scoring:
1: Bottlenecks
2: Some provisions available
3: Some provisions missing
4: All provisions available

Regulation 1775 – Network Code

The present Network Code is based on the dominance of INA on supply and import. A new Network Code to be in compliance with Regulations on the natural gas market and general conditions for the natural gas supply, and achieve compliance with Regulation 1775 is being worked on and expected to be completed by the end of 2008. Main elements to incorporate are:

- TSO services (providing firm and interruptible services, and long and short term services; the price of interruptible capacity shall reflect the probability of interruption; offering both long and short term services);

32 Gas sector-the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
• Principles of capacity allocation mechanisms and congestion management procedures;
• Transparency requirements (publishing detailed information regarding all available services and conditions; publish information on technical data on relevant entry points in a user friendly standardized manner);
• Balancing rules and imbalance charges
• Development of harmonized transportation contracts and procedures on the primary market to facilitate secondary trade of unused capacity (UIOLI).

Information regarding capacity reservation has not been published yet. The preparation of an information system to provide support to commercial gas transmission management (Gas Transmission Management System) is in the progress. Method of calculation and publishing of information concerning available capacities, in compliance with EU acquis, is also to be elaborated within this information system. The “Less than 3” rule will apply regarding transparency and relevant compliance with the Regulation 1775 will be achieved as reported.

3.2.4 FYROM

General issues-market structure

The concept of the gas market is defined in the Law on Energy, Official Gazettes 63/2006 and 36/2007) which has created the prerequisites for the development of the gas market, including provisions for legal and financial unbundling of the transmission, distribution and supply functions.

However the market is still very small and at present there is only one supplier (importer), Makpetrol AD Skopje (share holding company) with license for the supply of tariff consumers connected to transmission system, whereas wholesale market is absent. Makpetrol is the former state oil and gas company and since 1998 a totally private joint-stock company and the biggest company in FYR Macedonia for distribution and trade with oil products oil derivates and gas distribution.

The TSO is GA-MA JSC, responsible for transportation of natural gas and management of the gas system. It is 50% owned by the government and 50% by Makpetrol. Reforms in the gas sector implemented so far include:

- Separation of the public services from the commercial activities
- Separation of the ownership of the transport infrastructure from the transport operation and transport system operation of natural gas as a public service
- Establishment of an independent company for transport services under regulated conditions
- Granting concessions for gasification, distribution and supply of tariff consumers for a specified territory and determined period for investors.
Regulation

The regulator for gas is the Energy Regulatory Commission (ERC), established in 2003, with responsibilities among others on licensing, transmission tariffs, market rules and dispute settlements. An organigram of ERC is presented in Appendix 7.

Market Opening

Eligibility can be applied to customers with annual consumption above 10 Mcm as well as retail suppliers to tariff customers (about 40% of the market). On 2007 ERC brought a resolution by which the company “Toplifikacija AD” – Skopje is announced as an eligible customer of natural gas, which applied from 01.01.2008.33

Until present 7 licenses for performing energy activities in the sector of natural gas have been issued, from which 4 are licenses for trade with natural gas.

Unbundling

Accounting and functional unbundling is required by the Energy Law and the TSO has been unbundled legally until present.

Legislation - Compliance with EU Acquis

Many crucial provisions of the Directive 2003/55/EC have still not been transposed in the primary legislation. Particular regulations developed recently concerning natural gas are:

- Rulebook on the method and conditions for regulating prices for transmission, distribution and supply of gas (94/05)
- Tariff systems for transmission and retail (94/05)
- Tariff system for supplying the consumers which are connect on the transmission system,
- Rulebook on the method and conditions for issues changes and revokes of the licenses.

Status of gas regulation, in relation to compliance with the acquis, is presented below:

33 http://www.erranet.org/AboutUs/Members/Profiles/Macedonia2
Table 14 FYROM: Progress on EU Acquis

<table>
<thead>
<tr>
<th>Issue</th>
<th>Status</th>
<th>LOI</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public service obligation and customer protection</strong></td>
<td>Partially in line with Directive 2003/55/EC.</td>
<td>3</td>
<td>More details in particular with regard to provisions on the appointment of a supplier of last resort and with respect to provisions for vulnerable customers' protection - It is envisaged that these rules should be part of the Conditions for Natural Gas Supply.</td>
</tr>
<tr>
<td><strong>Monitoring security of supply</strong></td>
<td>Rules are provided for in the law;</td>
<td>3</td>
<td>Detailed rules for the operation of the system could be included in the market rules.</td>
</tr>
<tr>
<td><strong>Technical rules</strong></td>
<td>The provisions are to some extent available. The Transmission Grid Code is under preparation.</td>
<td>2</td>
<td>ERC is in the phase of development of a distribution grid code although there is no DSO in place currently.</td>
</tr>
<tr>
<td><strong>Unbundling provisions and access to accounts</strong></td>
<td>Unbundling rules and access to accounts' provisions are foreseen in the law, but not fully in compliance to the Directive 2003/55/EC</td>
<td>2</td>
<td>Further details for practical operation can be provided for in the market rules</td>
</tr>
<tr>
<td><strong>Third party access</strong></td>
<td>No sufficient provisions on TPA. The Rulebook on the Conditions, Manner and Procedure for granting and Depriving of the Capacity of Eligible Customer (OG 49/07) has been issued.</td>
<td>3</td>
<td>Detailed rules on TPA are foreseen to be part of the Transmission Grid Code</td>
</tr>
<tr>
<td><strong>New infrastructure and exemptions</strong></td>
<td>Rules for new infrastructure are partially available.</td>
<td>2</td>
<td>Missing provisions, in particular provisions dealing with New Infrastructure in accordance with the Art. 22 of the Dir. 2003/55/EC.</td>
</tr>
<tr>
<td><strong>Market opening</strong></td>
<td>Available provisions have to be accommodated with the requirements of the Treaty.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Cross border trade mechanism</strong></td>
<td></td>
<td>1</td>
<td>Compliance until the end of 2008 with Regulation 1775</td>
</tr>
<tr>
<td><strong>Regulation 1775/2005/EC</strong></td>
<td>Some provisions on tariffs for network access and TPA and transparency</td>
<td>1</td>
<td>Needs compliance in all areas</td>
</tr>
</tbody>
</table>


Scoring:
1: Bottlenecks
2: Some provisions available
3: Some provisions missing
4: All provisions available

34 Gas sector-the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
Regulation 1775 – Network Code

The Network Code has been elaborated by GA-MA. The procedure is currently at a final stage. The Code will comprise provisions allowing full compliance with Regulation 1775. It will address, amongst other things, TPA, congestion management, balancing, capacity allocation etc. Information that is being published is still limited, there is no information on capacities whereas rulebooks and tariffs are not published in English yet. The web site of the TSO is under construction.

Training requirements

Staff from the TSO has been involved in training programs in Russia, Italy, Germany, and the UK whereas staff from ERC has attended the summer school program which IS organized by ERRA (Energy Regulators Regional Association) in Budapest. A requirement for further capacity building on regulatory matters as been expressed.

3.2.5 Montenegro

Currently there is no gas market in Montenegro. Existing legislation foresees powers of the regulator Energy Regulatory Agency of Montenegro (ERA) in the gas sector but in practice due to absence of gas infrastructure and supply there is no practicing of this competence. Therefore, regulatory frame is at the early stages of development.

The only important document prepared until present is the draft Law on production.

No concrete actions towards approximation with the acquis have been elaborated until present.

3.2.6 Serbia

General issues-market structure

Legal and regulatory framework for natural gas market has been evolving. The Energy Law came into force in August 2004. The Ministry of Energy and Mining is the responsible body granting authorisation for all natural gas facilities construction and refurbishment. The entire gas infrastructure is regulated except from transit to BiH.

Concerning key market players, TSO is the public enterprise “Srbijagas”, established in 2005 from the restructuring of the National Oil and Gas Company of Serbia, into three different companies. Srbijagas, which owns 97% of gas transport network, is an integrated fully state owned public enterprise performing natural gas transport, distribution, storage, trade and supply to tariff customers. Yugoros gaz, a joint venture of Srbijagas (25%), Centrex (25%) and Gazprom (50%), owns 67.5km of high pressure pipelines in southern part of Serbia, i.e. the remaining 3% of transport network.

Concerning distribution, 72% of the market is served by Srbijagas and 28% by 32 other distribution companies with different kind of ownership (private and public) responsible for distribution and supply of natural gas in northern part of Serbia.

Regarding trade, Srbijagas performs wholesale and retail trade for captive customers (regulated prices) and wholesale trade for the open market, whilst 30 DSOs have been
issued licenses for natural gas retail (regulated prices) and 10 companies have been issued licenses for trade for eligible customers in Serbia by the end of 2007.

TPA is regulated according the Energy Law for transmission, storage and distribution and the network code is under preparation. There is negotiated TPA in upstream pipeline network.

**Regulation**

The licences for gas activities are granted by the Energy Agency of the Republic of Serbia (AERS), the competent regulatory body for gas. The Agency was established in 2005, and according to the Energy Law has responsibility for licensing, price regulation (pricing methodologies and tariff systems for transmission, distribution, end-user prices for captive customers as well as methodologies for determination of network connection charges) and dispute resolution (on TPA and connection to networks).

**Market opening**

In 2008 the Council of AERS passed a decision by which all non-household customers could obtain eligibility regardless of annual consumption. The Decision is applied as of February 23rd 2008\(^{35}\). The result of this Decision is a potential market opening of 90%. Full market opening should be reached by 1 January 2015.

**Unbundling**

The TSO has accounting and functional unbundling, but not legal or ownership. Legal separation is foreseen at the amendments of the Energy Law.

All DSO have less than 100,000 customers. Legislation does not require companies to legally unbundle distribution and supply activities. It is expected that such obligation will be introduced also through the amendment of the Energy Law in compliance with 2003/55/EC Natural Gas Directive. The activities of DSO and supply are unbundled within the distribution companies in terms of accounting.

**Legislation - Compliance with EU Acquis**

The following legislature is under preparation:

- Amendments of Energy Law – under preparation by the Ministry of Energy and Mining
- Network codes for transmission and distribution - in preparation process (to involve congestion management methodology)

The secondary legislation is mostly completed and nonetheless, the new structure is seen to be mostly compatible with 2003/55/EC Natural Gas Directive. Some features of gas regulation in Serbia, in relation to compliance with the acquis, are presented below:

\(^{35}\) Only one customer has so far exercised the right to become eligible and Srbijagas still currently supplies this customer.
Table 15 Serbia: Progress on EU Acquis

<table>
<thead>
<tr>
<th>Issue</th>
<th>Status</th>
<th>LOI</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public service obligation and customer protection</strong></td>
<td>The Energy Law contains provision with regard to PSO.</td>
<td>2</td>
<td>More detailed specifications, which could be included in the market rules—taking the specifics of Serbia into account—are needed.</td>
</tr>
<tr>
<td><strong>Monitoring security of supply</strong></td>
<td>Provisions for the monitoring of security of supply are included.</td>
<td>4</td>
<td>More details for the practical operation of the system are needed; the role of the regulatory authority has to be clarified; Art. 41 of the Treaty should be taken into consideration.</td>
</tr>
<tr>
<td><strong>Technical rules</strong></td>
<td>Relevant rules are available but the tasks of the system operators are not completely in line with 2003/55/EC.</td>
<td>4</td>
<td>Needs: Detailed rules for the practical operation could be done in the market rules.</td>
</tr>
<tr>
<td><strong>Unbundling provisions and access to accounts</strong></td>
<td>The available provisions need clarification with regard to unbundling requirements.</td>
<td>3</td>
<td>Provisions for the compliance programme missing. The rights of access to accounts should be precisely determined; the rules for practical operation could be provide for in the market rules. TSO has not yet been legally unbundled</td>
</tr>
<tr>
<td><strong>Third party access</strong></td>
<td>Provisions on the third party access are available.</td>
<td>4</td>
<td>The definition of costs; TPA provisions for storage facilities in line with Directive 2003/55/EC; more detailed rules to make the system operational.</td>
</tr>
<tr>
<td><strong>New infrastructure and exemptions</strong></td>
<td>Provisions for new infrastructure (Article 22 of the Directive 2003/55/EC) are to some extent available;</td>
<td>1</td>
<td>Provisions have to be developed; rules for the practical operation have to be included in the market rules to make the system workable.</td>
</tr>
<tr>
<td><strong>Market opening</strong></td>
<td>Provisions with regard to market opening are available; since end of February 2008, all non-households customers are eligible.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Cross border trade mechanism</strong></td>
<td></td>
<td>1</td>
<td>Compliance until the end of 2008 with Regulation 1775</td>
</tr>
<tr>
<td><strong>Regulation 1775/2005/EC</strong></td>
<td>Some provisions on tariffs for network access and TPA</td>
<td>2</td>
<td>Needs: CAP and CM, balancing rules, transparency, derogations, reporting</td>
</tr>
</tbody>
</table>


Scoring:
1: Bottlenecks
2: Some provisions available
3: Some provisions missing
4: All provisions available

36 Gas sector—the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
Regulation 1775 – Network Code

Transmission Network Code is in process of preparation. Nominations, allocations, balancing tolerance and congestion management should be part of Network Code.

It must be noted that currently nominations and gas allocation procedures for shippers face problems due to the lack of daily meters at MMRS exit points as well as lack of SCADA and software for nomination and trading. In addition the procedure for capacity contracts in case of decreased entry capacity, prices for balancing gas in the absence of relevant gas market price and balancing tolerance are additional areas that are being dealt with. Balancing period will be 1 day.

Regarding transparency, capacity contracting procedure and tariff system modification which include interruptible capacity should be implemented in 2009 together with TSO obligation to publish all information about capacity. Information about gas prices is published (Government approved them on 9 October 2008). All tariff elements will be published also.

Full compliance with 1775/2005 will be possible when all exit points are equipped with daily meters and will have adequate IT solutions to deal with capacity and natural gas trading on daily level.

Training requirements

A TA for Srbijagas will start shortly including calculating physical capacity of transmission system, technical and market rules implementation, advancement of the gas market, interoperability with transmission systems of neighboring countries etc. A TA also seems to be required in certain aspects of the Network Code preparation.

3.2.7 UNMIK

General issues


Regulation

Existing legislation foresees powers of the regulator in the gas sector, to the fully-independent Regulator (Energy Regulatory Office - ERO). ERO, established in 2004, is a completely autonomous entity from any Governmental Department to exercise economic regulation in the energy sector (Electricity, District Heating and Natural Gas. ERO has competences on licensing, methodologies for transmission and transit tariffs, market rules and dispute resolution. However it should be noted that in practice due to absence of gas infrastructure and supply there is no practicing of this competence. ERO’s organizational structure is presented in Appendix 7.

Legislation - Compliance with EU Acquis

Regulatory frame is at the early stages of development. The Ministry of Energy and Mining has elaborated the draft Law on Gas which transposes partially the requirements of the Directive 2003/55/EC into a national gas legal/technical framework. This will enable
UNMIK to participate in the regional gas network. Based on the provision of the Law the following status regarding approximation of legislation can be noted:

Table 16 UNMIK: Progress on EU Acquis

<table>
<thead>
<tr>
<th>Issue</th>
<th>Status</th>
<th>LOI 37</th>
<th>Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public service obligation and customer protection</td>
<td>The provisions in line with the requirements of the Directive 2003/55/EC.</td>
<td>3</td>
<td>Role of the TSO, related to the transit, is not clearly determined.</td>
</tr>
<tr>
<td>Monitoring security of supply</td>
<td>The rules for the security of supply issues are not explicitly determined,</td>
<td>2</td>
<td>The Law on Energy does not clarify whether these provisions are applicable “just” for electricity, or generally for energy (including gas provisions with respect to the scope of the safeguard measures as well as the provisions regarding the duration and the provisions).</td>
</tr>
<tr>
<td>Technical rules</td>
<td>The relevant rules are mostly in line with the Directive 2003/55/EC.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Unbundling provisions and access to accounts</td>
<td>The unbundling requirements are almost entirely consistent with the requirements</td>
<td>3</td>
<td>Provisions for the unbundling of accounts for eligible and non-eligible customers are still missing.</td>
</tr>
<tr>
<td>Third party access</td>
<td>Provisions on the TPA are available</td>
<td>3</td>
<td>Clarification with respect to granting TPA. The provisions of Art. 18 (2) of the Dir. 2003/55/EC are needed. Clear rules should be used to describe what steps could be taken in the event of a refusal of access to the system</td>
</tr>
<tr>
<td>New infrastructure and exemptions</td>
<td>The provisions are almost entirely consistent with Article 22 of Dir. 2003/55/EC.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Market opening</td>
<td>No progress made</td>
<td>2</td>
<td>Open market for all customers has to be developed</td>
</tr>
<tr>
<td>Cross border trade mechanism</td>
<td></td>
<td>1</td>
<td>Compliance until the end of 2008 with Regulation 1775</td>
</tr>
<tr>
<td>Regulation 1775/2005/EC</td>
<td>Some provisions on tariffs for network access and TPA</td>
<td>1</td>
<td>Needs compliance in all areas</td>
</tr>
</tbody>
</table>


Scoring:
1: Bottlenecks
2: Some provisions available
3: Some provisions missing
4: All provisions available

37 Gas sector-the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
4 FIELD VISITS

Representatives of the Regulatory Authorities in the Contracting Parties were sent the
Information Request letter, which is attached as Appendix 4. Responses to the
Information Request were sought prior to the field visits, and responses were received
from the Croatian, Serbian and FYROM regulatory authorities. Because of the difficulties
in initially arranging meetings in BiH, a response to the information request was not
received but all the relevant issues were discussed in the meetings.

The general structure of the field visit was to arrange a combined meeting with the
regulatory authority and the TSO to go through each item in the Information Request, as
well as discussing the overall Study and the issues that are being addressed. In BiH,
separate meetings were held with BH Gas and Gas Promet.

Meetings were held on the following dates:

Croatia – October 20th
Serbia – October 21st
FYROM – October 30th
BiH – November 5th

Meeting reports, including responses to the information request, are included in Appendix
8.
5 INITIAL CONCLUSIONS

5.1 OPERATIONAL DEVELOPMENTS OF GAS TRANSMISSION

According to the TOR for the study, the Consultant will investigate the operational developments of gas transmission under Third Party Access in Contracting Parties and the EU Member States with which they are interconnected, with a view to:

- identifying the necessary steps for the full integration and interoperability between neighbouring Contracting Parties and EU Member States;
- promoting good practice in gas transmission and compliance with Regulation on Conditions for Access to the Gas Transmission Networks, Regulation 1775;
- promoting good practice in gas balancing taking into account the relevant ERGEG guidelines;
- promoting the eventual adoption of Common Business Practices defined by EASEE-gas;
- adopting transparent capacity calculation methodologies and their publication, taking into account the relevant ERGEG Guidelines;
- illustrating the necessary methodological improvements to the personnel of transmission system operators and regulatory authorities;
- identifying the main related requirements including network enhancements, metering and other equipment, software, and the necessary personnel training.

In the conclusions below, each of the above areas is reviewed in turn, discussing the issues in each Contracting Party.

5.1.1 Necessary Steps for Full Integration and Interoperability

Interconnections within the area are currently limited, normally to one per Contracting Party. Bosnia and Herzegovina only interconnects with Serbia, Croatia only with Slovenia, Serbia has an import point with Hungary and an export point with Bosnia and Herzegovina, while FYR of Macedonia only interconnects with the Bulgarian system and has no connections with any of the other Contracting Parties. There are plans for additional interconnections to diversify supply as discussed below.

As a consequence the prospects for full integration and interoperability are limited. As a first step, however, it is recommended that detailed Interconnection Agreements (IAs), between TSOs, at all the interconnection points – both between Contracting Parties and EU Member States – be put in place, using the EASEE-gas Common Business Practice (2005-002/01)

A “Balancing Shipper” type of IA will probably be adequate as a first step. The IA between Bosnian and Serbian TSOs should include all TSOs involved, i.e. BH Gas, Sarajevo Gas Lukavica, Gas Promet and Srbijgas.

5.1.2 Promoting Good Practice in Gas Transmission and Compliance with Regulation 1775

The main topics addressed by Regulation 1775 and the associated guidelines include:
Study on Improvement of Interconnection, Interoperability, Transparency and Harmonisation of Operational Rules for NG Transportation in the Energy Community

Final Report

- The criteria for setting tariffs for TPA
- A common minimum set of TPA services
- Common Rules regarding contractual congestion of networks
- Information in particular on technical requirements and available capacity
- Rules on fair balancing systems
- Common basic requirements for trading of capacity

These topics should generally be covered in the Network Code of the TSO. Network Codes are being developed by most TSOs in the Contracting Parties. In Croatia the TSO and regulatory authority seem confident it will be fully compliant with Regulation 1775 and the same situation exists in FYR of Macedonia.

In Serbia, the Network Code is being developed and the necessary systems are under development. Open issues include: congestion management, balancing prices and tolerance levels. The TSO is also seeking greater clarity regarding the separation of responsibilities between TSO and shippers.

In Bosnia and Herzegovina, Gas Promet is developing a Network Code. However, BH Gas cannot make any progress on unbundling, Network Codes etc. until a Gas Law is passed and a proper regulatory authority is set up.

Currently, there is only one shipper on all the TSOs’ systems. In each case the single shipper is the incumbent gas supply company, and in the case of BH Gas the company has not been unbundled yet. As a consequence it is unlikely that the new Codes will be tested to any great extent in the foreseeable future.

A copy of the FYR of Macedonia draft Network Code has been received by the Consultants but none of the others are available in English.

In respect of tariffs, currently all the TSOs use a postage stamp transmission tariff, where there is one, which would enhance harmonization between the Contracting Parties.

5.1.3 Promoting Good Practice in Gas Balancing

The main thrust of the ERGEG guidelines, as they relate to cross border trade, is that TSOs should endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate gas trade as already required by Regulation 1775.

No balancing rules currently exist in the Contracting Parties, although they are being developed as part of the draft Network Codes in Croatia, Serbia and FYR of Macedonia. Balancing is currently seen as a technical, operational issue and, outside Croatia which has storage available, systems are balanced through linepack and, in some cases, peak gas imports and/or supply interruption. Storage is also being developed in Serbia.

5.1.4 Promoting the Eventual Adoption of EASEE-gas CBPs

The EASEE-gas Common Business Practices (CBPs) largely cover issues such as information provision and exchange in addition to the many issues that would be covered in an Interconnection Agreement – gas quality, nominations, allocations, matching process, measurement, balancing. Since there are no IAs in
place among the Contracting Parties, the main issues that are covered in the EASEE-gas guidelines, have not yet been addressed. However, as noted above, the implementation of harmonised detailed Interconnection Agreements between TSOs would go along way towards ensuring that the CBPs were adopted.

5.1.5 Adopting Transparent Capacity Calculation Methodologies

On 15 June 2007 ERGEG launched a public consultation on Calculation of Available Capacities\textsuperscript{38}. This public consultation focussed on the understanding of the various issues related to capacity calculation and was not yet a consultation on any kind of guidelines or recommendations. ERGEG sought views on ways for greater transparency, greater consistency and optimisation of available capacity calculation throughout the EU’s gas transmission networks. As a consequence of the public consultation ERGEG are developing a GGP on capacity calculation.

In Croatia and Serbia, work is in hand on the methodology of calculating capacity and the publication of information on available capacity.

5.1.6 Necessary Methodological Improvements to Personnel

In the past training had largely been on technical matters and the TSOs were mostly staffed by engineers. It was generally felt by the Contracting Parties that both TSOs and regulatory authorities would benefit from training and assistance on regulatory and commercial operations in the new gas industry environment. It was emphasised, however, that such training needed to be specific to the circumstances of the Contracting Party and very general training would not necessarily be beneficial. Ongoing assistance in commercial operational matters would also be helpful.

5.1.7 Network Enhancements, Metering and Other Equipment

Investment in metering and control equipment is ongoing in the Contracting Parties:

- In Bosnia and Herzegovina metering is done on a daily basis and BH Gas has partial SCADA system.

- In Croatia metering of entry and exit points is available on an hourly basis and there is a project in place for remote reading. A SCADA system has also been installed.

- In FYR of Macedonia the metering system at the border has been installed recently (3 years ago) and is quite sophisticated (ultrasonic). Gas quality is monitored regularly. However, improvement of downstream metering is necessary, which will help in the appropriate determination of system losses.

- In Serbia a project for a new SCADA system is being outlined, while a programme to install dataloggers is in hand and should be mostly completed by end 2010.

\textsuperscript{38} Understanding and Issues – An ERGEG Public Consultation Paper C06-CAP-06-03
5.2 **CAPACITY CONSIDERATIONS**

According to the TOR for the study, the Consultant will analyze current capacity availability as well as allocation and congestion management methodologies, starting from results of the 2007 Gas Survey, with a view to:

- Describing existing capacity allocation methods;
- Ascertaining to what extent reduced pipeline use is due to lack of demand, capacity reservation by long term contracts, or other causes including upstream difficulties;
- Diversified supplies and increased market liquidity;
- Suggesting remedies aimed at improving existing capacity and its use in the short and medium term;
- Suggesting new methodologies for capacity allocation and congestion management to be included in the new market rules;
- Proposing criteria for harmonisation of the market rules in the Contracting Parties.

In the conclusions below, each of the above areas is reviewed in turn, discussing the issues in each Contracting Party.

5.2.1 **Existing Capacity Allocation Methods;**

All the Contracting Party TSOs currently are single shipper systems and in Bosnia and Herzegovina unbundling has yet to take place. As noted above Network Codes are being drafted to provide TPA services and it is anticipated that capacity allocation mechanisms will be incorporated in the Codes. Congestion management has been identified as an open issue in the draft Network Code for Serbia.

5.2.2 **Issues of Reduced Pipeline Use**

The situation in respect of the use of pipeline capacity differs from TSO to TSO:

- In Bosnia and Herzegovina the internal system has capacity issues at peak but that is in part due to upstream constraints. This could be resolved through more internal compression but BH Gas and Gas Promet differ on where compression should be located.

- In Croatia capacity on the internal system is more than sufficient to meet existing demand and can be increased by use of compression. However at Rogatec – the Slovenian entry point – technical capacity is unclear. The capacity given is the contractual amount but technical capacity may be higher (provided adequate delivery pressure). Plinacro – the TSO – is not a party to the contract between INA and the Slovenian TSO. Capacity at Pula is underutilised so there is scope for more offshore production fields to be tied in.

- In FYR of Macedonia capacity on the internal system is more than sufficient to meet existing demand. No capacity issues are encountered since gas consumption is significantly lower than the overall capacity. However on some occasions during peak gas usage in Greece during winter, pressure falls but this problem will be fixed shortly through the utilisation of the 2\textsuperscript{nd} compressor station in Bulgaria. However, upon completion of 2 new CHP power plants, a substantial increase in demand may mean that capacity constraints might occur in 2012-2013.
• In Serbia capacity on the internal system will be more than sufficient to meet existing demand, when the new storage facility starts up (5 Mcm/day deliverability). Capacity utilisation at the Serbian-Hungary border point is only just over 50%, but there are potential upstream capacity constraints in Ukraine. A simple TSO to TSO agreement is in place for meter readings.
• The main issue would appear to be upstream difficulties particularly in Ukraine. It is reported that these upstream capacity constraints are in the process of being resolved but it remains to be seen the extent to which this will be achieved.

5.2.3 Diversified Supplies

The Contracting Parties have a number of plans to diversify supply and transport capacity:

• In Bosnia and Herzegovina there are potential additional connections with Croatia in the north, south and west but in the longer term effective diversification, of supplies and capacity, may require additional connections with new pipeline projects from the east. The proposed Croatian LNG terminal may also provide opportunities for diversification.
• In Croatia connections are planned to Hungary as well as a new LNG terminal, expanded Slovenian capacity and possibly the IAP project.
• In FYR of Macedonia the proposed gas ring may provide a connection to other Contracting Parties and the IAP project may also diversify supplies.
• In Serbia a connection to Croatia was mentioned and any new pipelines to the region, from the east in particular would improve diversity.

Apart from the possible LNG terminal on the Croatian coast, plus any additional connection to Italy, the main route to diversify supplies would be effectively from the south east through Turkey and/or the LNG terminal of Greece.

5.2.4 Improving Existing Capacity Use

Apart from some peak capacity issues in Bosnia and Herzegovina, existing capacity on the internal transmission systems is largely underutilised. Projects to increase gas demand in the Contracting Parties could be accommodated to increase utilisation of existing capacity, with additional compression and storage projects in Serbia and Bosnia and Herzegovina, in particular, providing the required peak capability. However, any significant increase in demand would require the alleviation of upstream constraints and/or the diversification of gas supply and transportation capacity.

5.2.5 New Methodologies for Capacity Allocation and Congestion Management

All the Contracting Party TSOs currently are single shipper systems and in Bosnia and Herzegovina unbundling has yet to take place. As noted above Network
Codes are being drafted to provide TPA services and it is anticipated that capacity allocation mechanisms will be incorporated in the Codes.

5.2.6 Harmonisation of Market Rules

Since market rules have yet to be defined, progress on harmonisation can proceed at the same time as the drafting of the rules. Proposals on the scope of such harmonisation are provided in Chapter 6.

5.3 BALANCING REGIMES

According to the TOR for the study, the Consultant will analyze current methods used for balancing transmission networks including resort to storage facilities, with a view to improve the viability of the network and facilitate trading and entry of new suppliers:

- Examine possible alternatives and any difficulties to implement them;
- Propose a roadmap towards more advanced and market-oriented balancing regimes, also considering the ERGEG Guidelines on storage and flexibility services.

In the conclusions below, each of the above areas is reviewed in turn, discussing the issues in each Contracting Party.

5.3.1 Alternatives for Balancing Transmission Networks

The Contracting Parties are each confronted with differing circumstances:

- In Bosnia and Herzegovina - Linepack and interruption currently balance the system, although in the future storage maybe a possibility.
- In Croatia INA, the gas supplier and owner of the storage facility currently balances the system under direction from the TSO. Storage is the main balancing tool but INA can renominate to both suppliers and customers.
- In FYR of Macedonia no storage is planned and linepack is currently used to balance the system.
- In Serbia the use of peak capacity at the border and domestic production is used to balance the system, combined with interruption of large users. Proposed storage facilities would help.

The issues associated with commercial balancing have not yet been addressed by the Contracting Parties, although they should be in the Network Codes that are being drafted.

5.3.2 Roadmap towards more Advanced and Market-Oriented Balancing Regimes

In view of the fact that commercial balancing regimes have yet to begin being developed, and that competitive, liberalised markets are some way off, it is premature to begin discussion of market-oriented balancing regimes. The key principles are covered in the Guidelines for Good Practice for Gas Balancing which include the need for TSOs to ensure compatibility of balancing regimes (tolerances, imbalance charges etc) in order to facilitate gas trade across borders of different TSO systems. TSOs shall endeavour to harmonise balancing regimes and streamline structures and levels of balancing charges in order to facilitate trade.
Where it is justified that balancing regimes (tolerances, imbalance charges, balancing periods etc) remain different between interconnected networks, “standardised agreements”, often in the form of operational balancing agreements (OBAs), and procedures between TSOs should be put in place in order to facilitate gas trade, and cooperation in the physical balancing, on a daily basis, of their respective systems. If necessary, these “standardised agreements” could be incorporated as part of the relevant Interconnection Agreements between TSOs.

In the more advanced balancing systems, shipper imbalances can be “cashed out”, maybe on a daily basis, if a liquid market for gas exists. However, in the absence of a liquid market and/or a balancing price that is seen as being independently determined i.e. not by the shippers or the TSOs, then a physical “make-up” balancing regime is likely to be a better initial option. The structure of such a regime is discussed in the preliminary proposals.

5.4 CONTRACTING PARTIES WITH NO CURRENT GAS SYSTEM

The Contracting Parties with no current gas system – Albania, Montenegro and UNMIK – are all in the early stages of developing their regulatory systems. In the case of Albania and UNMIK gas laws have been drafted. In terms of the objectives of this study, therefore, and the timescales involved for these Contracting Parties to develop their systems, it should be possible for them to be brought into whatever procedures and regulations are put in place in terms of interoperability, interconnection and harmonisation.

5.5 GENERAL CONCLUSIONS

It was noted in the Introduction (taken from the Terms of Reference) that “the final report will also suggest, for each Contracting Party, the main remedial actions that are necessary to remove such obstacles, and suggestions for the harmonization of technical market rules, aimed at increasing market integration and liquidity. Proposed solutions will be based on those adopted in the European Union and consider, as far as feasible, the best practices of the EU Member States”.

The EU Directives, guidelines, regulations and also the ERGEG and EASEE-gas codes and common business practices are largely focused on the large complex gas transmission systems found in the larger EU Member States such as the UK, Germany, France, Italy, Netherlands and Spain. The transmission systems in the Contracting Parties are much smaller, relatively simple systems which do not necessarily require a lot of detailed complex rules. While it is important that the Contracting Parties follow the broad principles of the various directives, regulations and guidelines, any proposals and recommendations need to be appropriate for the respective transmission systems.

Based on the preliminary desk research and the visits to the respective TSOs and regulatory authorities, the preliminary conclusions are as follows:

- There are no TSO to TSO Interconnection Agreements (IAs) at the respective transfer points in any of the Contracting Parties. Common IAs based on the EASEE-gas common business practices should be put in place at all the current (5) transfer points.
- Network Codes are currently being developed in all the Contracting Parties, apart from BH Gas in the Federation of Bosnia and Herzegovina, although no drafts have been seen, other than the one provided by FYR of Macedonia. It is not possible, therefore,

39 Albania has a very small amount of domestic gas production.
to assess if they conform to Regulation 1775, guidelines on balancing etc and to what extent they are harmonized with neighbouring TSOs.

- Upstream capacity constraints in Hungary and Ukraine were identified as issues in a number of the Contracting Parties and these are likely to limit market development. The diversification of both gas supply and transportation, away from traditional sources via Ukraine is an urgent requirement, particularly from a security of supply perspective. It is reported that these upstream capacity constraints are in the process of being resolved but it remains to be seen the extent to which this will be achieved.

- In the context of the need to diversify, the planning and coordination of investment requirements and upstream capacity and supplies would benefit Bosnia and Herzegovina, Croatia and Serbia immediately and FYR of Macedonia ultimately.

- The lack of knowledge and expertise in the commercial and regulatory implications of the changing gas market environment was identified by most TSOs and regulatory authorities. Specific assistance and training, tailored to the needs of the Contracting Parties, would benefit all the TSOs and regulatory authorities.

- In Serbia the TSO identified open issues with the draft network code in the areas of congestion management, balancing charges and tolerances and the separation of responsibilities between the TSO and shippers.

- In FYR of Macedonia, the remoteness from other Contracting Parties is an issue and the prospect of diversification of supplies and transportation may be longer term than for other Contracting Parties, although separate interconnections with EU member states are possible.

- In Bosnia and Herzegovina, there is a complex structure with 3 TSOs – BH Gas, Sarajevo Gas - Lukavica and Gas Promet – in a relatively small gas market, which is considered to result in more barriers, towards both harmonization and the investment required to grow the gas market and ensure the reliability of energy supplies, compared with the other Contracting Parties.

- In Croatia, there is a lack of clarity in the respective roles of Plinacro (TSO) and INA (gas supplier), with INA performing some roles, including the interconnection arrangements at the transfer point with Slovenia, that should be performed by the TSO in an unbundled environment.
6 INITIAL PROPOSALS

The Contracting Parties Transmission System Operators (TSOs) are still in the relatively early stages of developing the commercial and operational parameters through which they will undertake natural gas transportation in the new market environment, although some, such as Croatia, are relatively more advanced than others.

In this context, there would appear to be few, if any, significant obstacles to improving interconnection, interoperability, transparency and harmonisation of the operational rules. It should be said, however, that each Contracting Party TSO appears to be developing the commercial and operational parameters somewhat in isolation from each other. This is not necessarily in line with the targeted creation of a single regulatory environment for gas trade, to which the Contracting Parties are committed based on the Energy Community Treaty.

The preliminary proposals outlined below draw largely on the general conclusions in section 2.5 above.

Contracting Party TSO Working Group

A Contracting Party TSO Working Group (TSOWG) should be set up, probably under the auspices of the Energy Community, with a remit to ensure that all the rules, regulations and procedures necessary for harmonisation and interoperability both within the Contracting Parties and with neighbouring EU Member States, are adopted and implemented. The TSOWG, once established, could take responsibility for ensuring the remaining proposals below are implemented. In the future the TSOWG could also provide a link between the EC and the proposed Network of Transmission Operators under the third EC package for gas. Ideally, this TSOWG should also include TSOs from neighbouring countries to be really effective.

Interconnection Agreements

Common TSO to TSO Interconnection Agreements (IAs) should be put in place at all interconnection points both between Contracting Parties and also EU Member States. The IAs should be based on the EASEE-gas common business practices (CBP). The CBP requires that an IA between two TSOs should cover both technical and commercial interoperability issues including the following:

- Matching – the exchange of information, to arrive at matched quantities, based on nominated quantities and taking into account constraints
- Rules for Flow Control – agreements on rules of how flow control will be handled at interconnection point, and rules on changing flow rates
- Measurement Principles of gas quantities and gas quality, in line with international standards, taking into account procedure, accuracy and quality assurance, allocation of differences, metering corrections, exchange of metering data, access to calibration data and audit reports
- Gas Quality Specifications
- Allocation Rules which ensure consistency, description of allocation method and close out period for revision to allocations
- Procedures for balancing shipper flows and dealing with imbalances
- Co-ordination of Operation
- Information Exchange between adjacent TSOs
• Exceptional Events
• Changes to the IA

The IAs will effectively cover many of the issues necessary for harmonisation and interoperability. More detail on the requirements for an IA are included in Appendix 1.

**Network Code Harmonisation**

The respective network codes in the Contracting Parties TSOs should be harmonised with each other and with the proposed IAs. The respective Network Code drafts currently being prepared should be compared to ensure that they do not conflict with each other and allow for the simple and effective transportation of gas across the Contracting Parties. For example an approach for the convergence of balancing regimes should be sought, enabling the efficiency of cross border flows, which will be essential in the medium to long term, despite the current small market sizes and few entry-exit points. The Network Codes must also focus on enhancing information provision and transparency, regarding services offered by TSOs, in compliance with Regulation 1775.

Only one country, at present, has provided its Draft Code in English, and therefore no preliminary conclusions can be made as to the level of harmonisation achieved. However, at a minimum, the Network Codes should be harmonised as far as possible in the areas of:

• Defining (i.e. entry/exit, point-to-point, postal system) and booking capacity, including dealing with capacity overruns and congestion management, the time of the gas day;
• The process of, and timetable for, nominations and renominations, scheduling gas flows, and the procedures for allocating gas flows to shippers after the gas day;
• The calculation and resolution of shipper imbalances,;
• Gas specification, including dealing with off-specification gas;
• Publication of information and method of publication; and
• System emergencies, and the procedures for dealing with them, and the arrangements for dealing with operational difficulties, which may restrict the flow of gas on the day and/or reduce the availability of capacity.

The general aim of the harmonisation of the Network Codes would be for the different transmission systems to operate as smoothly as though they were a single system.

**Initial Balancing Regimes**

As noted in the conclusions, in more advanced balancing systems, shippers can be “cashed-out” on a daily basis, where a liquid trading market for gas exists. For the Contracting Parties, however, a liquid trading market is some way off. As part of the Network Codes, therefore, it would be recommended that a physical “in-kind” or “make-up” balancing regime is initially put in place. In such a “make-up” regime, each shipper has a running imbalance account and is generally obligated to keep this account as close to zero as possible, by making up any negative imbalance on one day with a positive imbalance on subsequent days. Shippers can be incentivised to maintain the zero imbalance through regulated charges for not reducing imbalances within a defined period. Make Up balancing regimes can also be used in Interconnection Agreements at the cross border points.
**Investment Planning**

The TSOs should produce, annually, a collective “10 Year Development Statement”, similar to those produced by TSOs in the EU Member States. The statement, or plan, would cover demand and supply forecasts (both annual and peak), the requirement for transportation capacity both on the Contracting Parties TSOs and requirements for upstream capacity and any commercial and regulatory developments which are likely to impact the TSOs.

**Upstream Capacity: TSO Booking**

Ideally, the Contracting Parties TSOs should take responsibility for contracting capacity on upstream pipelines, with the gas suppliers / shippers then booking capacity on a “virtual” pipeline system from the point at which they take title to the gas, through to their end user. The appropriate back-to-back agreements with shippers and regulatory rules would need to be put in place to ensure that the TSOs were not left with any investment in stranded capacity. The idea behind this is that ultimately this could promote competition in the various markets since, if end users opted to change supplier, that supplier could easily gain access to the upstream capacity as it could be automatically incorporated in the normal booking of capacity made when the end user changes. This structure would help to prevent the hoarding of capacity by the incumbent gas suppliers.

**Upstream Capacity: Collective Booking**

The Contracting Parties TSOs could also collectively contract for capacity on upstream pipelines as a consortium, enabling more efficient use of capacity. This may help stimulate investment in expanding existing routes and building new ones. As a consortium the Contracting Parties TSOs could make a larger booking on upstream pipeline systems than if they were booking on their own. They may also be able to book less capacity than they would if they each had to individually cover their own capacity requirements. Once the total capacity had been booked it could then be allocated between the TSOs as required with procedures for simple capacity transfers between TSOs as and when necessary.

**Improvement of metering**

Despite recent plans for new meters and SCADA systems, lack of metering in noted in several cases, e.g. in FYR of Macedonia downstream metering is not accurate, in BiH SCADA is partially used, and also in Serbia lack of adequate metering has been reported. Therefore modernisation of metering infrastructure should be seen as a priority. As an initial area of work, a simple audit of metering and technical, including software, requirements could be undertaken to identify the potential system gaps which could maybe attract donor support.

**Harmonisation of Transportation Tariffs**

Currently the Contracting Parties TSOs transportation tariff methodologies are all postage stamp. This structure is helpful to harmonisation and interoperability. If any changes are made to tariff methodologies, perhaps moving towards the entry – exit methodology favoured in many EU Member States, then such changes should be co-ordinated and harmonised.
Technical Assistance and Training for TSOs

The conclusions identified a lack of knowledge and expertise, on behalf of TSOs and regulatory authorities, in the commercial and regulatory implications of the changing gas market environment. Specific assistance and training, tailored to the needs of the Contracting Parties, would benefit all the TSOs and regulatory authorities.
APPENDIX 1 EASEE GAS COMMON BUSINESS PRACTICES

A.1.1 Secondary Capacity Trading

Earlier attempts to form a task force on the topic of Secondary Capacity trading have been made in the past. However, there was considerable variation in the level of commitment which made it difficult to achieve an aligned outcome across the various industry segments. By the end of 2006 the issue had increased in importance, generating considerable interest across all segments of the industry. So it was appropriate for EASEEgas to renew its efforts in this area and a revised Secondary Capacity trading task force was formed.

The secondary capacity trading task force had the goal of drafting a Common Business Practice (CBP) which would facilitate the Secondary Capacity market by researching existing problems in the different markets and finding a workable solution to improve the market conditions. Following completion of a consultation questionnaire by Shippers and TSO’s concerning their capacity markets, the group found that the biggest barrier to Secondary Capacity trading is the length of time it takes for capacity to be transferred between Shippers in the systems of a TSO. Additionally, the processes surrounding the transfer of capacity are different in the different systems, making capacity trading on a cross border level less efficient.

Whilst developing this CBP, the task force was aware that other European groups were also engaged in discussions on the topic of Secondary Capacity markets. The task force kept a close watch on these developments and took part in these discussions where required to ensure alignment of ideas. The EASEEgas task force was represented as a member of the ERGEG secondary market enabler group, was a guest speaker at one of the EFET gas committee meetings and had a visit from one of EFET’s members to discuss the EFET capacity market workgroup. The work of the task force found support and corresponded with the findings and conclusions of the other groups. Some of the task force’s terms and definitions were adjusted in an attempt to harmonise terminology across the industry groupings.

Below are some of the task force’s findings which can be helpful in understanding the background and thinking behind the CBP itself.

There is a clear relation between the primary and secondary market, which should be reflected in the secondary market products that are facilitated by the TSO. The TSO will facilitate the trade of capacity products that are available on the primary market. It is not required of the TSO to facilitate any products that are not available on the primary market, unless market parties demonstrate a clear need for such products. All markets are assumed to have implemented Regulation 1775/2005 on a national level. Other aspects of secondary capacity trading will also be discussed in the CBP, although the primary subject is the transfer of capacity.

The requirements of the capacity transfer process are one of the most important issues of the CBP. To this end a sub task force has drafted a proposal, which has been reviewed and refined by the complete task force. The results of these discussions can be found in chapter 3 of the CBP.
On the basis of all these requirements, it is the task force’s recommendation that an automated system with a web based customer interface is implemented by the TSO to transfer capacity. This web based interface is accessible to all Shippers at all times and provides a quick and easy overview of the outstanding and completed capacity transfers. It is a tool which is currently used in the market for several other purposes, which means that market parties are familiar with it and won’t need extensive training to use the tool.

When an automated system with a web based interface is used, it is possible to expand the capacity transfer system with other functionalities, such as a real time overview of available primary capacity and a bulletin board or trading platform. Another advantage of using a web based interface is the fact that Shippers will not have to implement a messaging system to communicate with the TSO’s capacity transfer system. A Shipper will simply log into the (protected) website and can view and respond to any outstanding, rejected or processed transfers or add new requests for a capacity transfer.

Coordination and harmonisation at the stage of development and implementation of this web based system will avoid extra costs at a later stage and will increase the possibilities for cross-border trading of capacity. The presence of the mentioned terms and conditions which the Shippers have to sign up to before getting access to the capacity transfer system, as well as the fact that these only need to be signed up for once, is a vital part of the capacity transfer process. It allows for capacity transfers to be processed quickly, as this process is completed before any transfer requests are made and it doesn’t need to be repeated for every trade.

TSO’s have the role of facilitators in the Secondary Capacity trading process and aim at developing Secondary Capacity trading facilities that are readily available to the market. In order to develop appropriate capacity trading services, monitoring of market requirements should be undertaken to ensure that Secondary Capacity trading functionalities evolve in conjunction with the liquidity of the market, in order to avoid non-market compliant developments being undertaken.

The lead times related to capacity transfer transactions should be aligned to those applicable to the commodity market. For example, it seems reasonable to apply the same closing hours for the day-ahead capacity market as those in operation in the dayahead commodity market. In order to promote the development of the capacity market, capacity transfer transaction lead times should evolve as described in section 5 of the CBP. These lead times depend on the deadlines for transaction requests on one hand and on the response time of the TSO’s on the other hand.

As within-day capacity transactions require more advanced IT developments, it is reasonable for the TSO’s to evaluate the need for within day transactions in conjunction with the development of liquidity in the capacity market. If the TSO’s evaluate that the development of a within day market for Secondary Capacity is required, TSO’s will develop a capacity transfer process which meets the request deadlines for within day capacity transactions, as mentioned here above.

The lead times for day-ahead and longer term capacity transfer as well as within day capacity transfer are not compatible with the terminal and storage IT system in which the transfer of capacity done through the secondary market has to be implemented: in fact (in France) secondary storage capacity has to be entered in the IT system before 1 pm for the next gas day since the calculations (rights, conditional offer, non-used storage rights and matching with the transportation capacity) of each clients begin at 2 pm. The main difference with the transportation is that the storage rights for one gas day are linked to the allocation of storage capacity the day before (since it is a function of the inventory level). It
is therefore suggested to adjust the lead times to the way the certain market is set up. However, TSO’s should strive to set the lead times at the latest possible time, to optimise the use of the secondary capacity market.

This CBP reflects minimum requirements and does not exclude the desirability of introducing or maintaining additional provisions between individual parties. The gas market, and therefore the Primary Capacity market, is continuously developing. As the products on the secondary market are linked to the products that are available on the Primary Capacity market, the secondary market for capacity will have to keep adapting to incorporate the developments of the primary market. The CBP has tried to reflect the changing nature of the market in the requirements as much as possible. However, some market changes may not have been anticipated.

The TSO are the facilitators of the secondary trading of capacity rights. They develop and operate the platforms that allow Secondary Capacity to be easily transferred between Shippers. Each TSO adapts its platform at the level of development of the secondary market, so that the functionalities of the platform would not restrain the liquidity of the secondary market. In the first steps of development of the secondary market, the TSO can play a role of intermediation between Shippers willing to transfer capacities, in order to trigger the activity on the market.

As the secondary trading of capacity develops, the role of the TSO shall progressively focus on the administration of an electronic platform allowing all the relevant types of transfers of capacity. The level of automation of the platform shall increase with the level of activity of the market.

The Shippers are the holders of transportation capacity and are responsible for making the market in Secondary Capacity.

**Seller/Holder**

As the seller of System capacity to a third party, the seller will enter a bilateral contract for the sale/transfer of the capacity. The seller will define the product offered for sale/transfer by indicating on a common agreed platform (e.g. TSO Bulletin Board):

- Location
- Quantity and whether the quantity may be disaggregated into smaller bundles subject to a minima.
- Price and payment terms
- Nature of sale or trade (Assignments, Transfer or SubLets)

A seller may also enter such a sale/transfer of capacity by acceptance of a posted buy bid. The seller will warrant that they have legal title to the product offered. The seller will comply with the prequalification requirements set by the TSO operating that System. Such requirements should not be unduly onerous and would normally be satisfied by being a registered user of that TSO’s network.

Subject to the arrangements for the trade the seller will be responsible for any original charges/penalties arising from the primary sale not transferred as part of this transaction (i.e. other than Assignments).

The seller will also inform the relevant TSO(s) in accordance with agreed timescales when the sale or trade has been agreed. All such changes (aside from SubLets) will be reflected in each party's capacity account with that TSO. This may be an automated part of the
process in the event that the platform for capacity transfer is common (this is the case for Transfer and could also be the case for Assignment).

**Buyer/Receiver**

The buying Shipper may accept any bid on the terms posted. Any variation of the terms should be regarded as a new bid. As the buyer of System capacity from a third party, the buyer will enter a bilateral contract for the sale/trade of the capacity. The buyer will comply with the prequalification requirements set by the TSO operating that System. Such requirements should not be unduly onerous and would normally be satisfied by being a Registered User of that TSO’s network. The buyer will also inform the relevant TSO(s) in accord with agreed timescales when the sale or trade has been agreed. All such changes (aside from SubLets) will be reflected in each party's capacity account with that TSO. This may be an automated part of the process in the event that the platform for trading is common (this is the case for Transfer and could also be the case for Assignment).

Shippers should be able to enter into more than one type of trade to transfer the use of capacity from one party to another. Standard terms and conditions should be used to facilitate the transfer of capacity. Trade structures may include:

**Novations** – The Receiver is contractually fully substituted for the Holder. All rights and obligations are transferred from the Holder to the Receiver and the Holder is no longer involved in any way for the quantity of capacity that has been Novated. A Novation requires agreement of the TSO, Holder and Receiver.

**Assignments** – The Receiver is contractually substituted for the Holder, and the Assignment is communicated to the TSO. All rights are transferred to the Receiver and payment for the capacity transferred is to be made by the Receiver instead of the Holder.

**Transfers** – Transportation capacity is transferred from the Holder to the Receiver in the TSO’s System. Contractual rights including payment and credit obligations do not transfer remaining with the Holder and the Transfer is communicated to the TSO.

**Sublets** – A third party utilises a Shipper’s transportation capacity through private arrangements with the Shipper. Contractual and operational obligations with the TSO do not transfer, and the private arrangements are not visible to the TSO. The Shipper remains the owner and user of the capacity in the TSO's System.

Market structures describe the way in which market parties find each other, when they wish to transfer capacity on the secondary market. Similar to the development of different trade structures, different market structures have appeared in the national and regional markets.

EASEEgas recommends TSO’s to implement a market structure that supports the processes as described in this CBP, enabling the TSO to handle very short lead times with a minimum of manual actions. This market structure consists of a capacity transfer process, under the responsibility of the TSO, which provides Shippers with easy access when informing the TSO of a trade.

In addition to the possibility to transfer capacity, the capacity transfer process could include a trading platform. This system will facilitate market development and ensures that capacity products (both long and short term) are available on the secondary market. The main function of the process is to facilitate transfer of capacity from one trader to the other. However, EASEEgas strongly advises the TSO’s to include the following functionalities;
A screen, which allow Shippers to post and accept offers and bids,
A space to post messages with additional information surrounding the secondary market,
An alert function, which informs Shippers on request of certain offers or bids being posted (via email, text message or popup)
Link with neighbouring TSO's systems to optimise cross border capacity trades

The system should have the flexibility to be expanded with other functionalities, such as;

- Real time primary capacity information.

Since the basic requirement of the capacity transfer process is the facilitation of capacity Transfers, this capacity transfer process will support and aid other continuous capacity measures and trade platforms. The aim of implementation of a capacity transfer process should be to enable all commercial market activities surrounding the Secondary Capacity market. However, centralisation of all supply and demand of Secondary Capacity will increase liquidity and transparency of the market. The CBP therefore suggests using the capacity transfer system to post offers and bids where possible, before using any other available methods, such as SubLet.

The process description for Novation has been taken out of the main body of the CBP, as the CBP and capacity transfer process are mainly focussed on Transfer and Assignment. However, the transfer of capacity after the contractual arrangements for Novation have been concluded could take place via the capacity transfer process according to below process.

**Novation**

The Holder shall notify the TSO of the intention to transfer Primary Capacity to the Receiver. Subject to the agreement of all parties, and the Receiver entering into the required contractual agreements with the TSO, the TSO shall transfer the capacity (and all of the rights and obligations that go with the capacity) from the Holder to the Receiver. The Holder may novate all or part (subject to any minimum quantity limits imposed by the TSO) of its capacity to a Receiver.

The TSO (or the operator of the capacity transfer process) shall define the terms & conditions under which Shippers can use their capacity transfer facilities. These terms & conditions will be transparent, freely available to all parties and easily accessible. They will be designed to facilitate capacity trade, enable the reasonable recovery of costs and protect all participating parties in case of credit issues, fraud and any other issues that are also covered in Primary Capacity deals. Shippers will be required to sign before any capacity transfer can be requested. Standard contracts between the TSO and Shippers, as well as between two Shippers are highly recommended, as these will shorten transaction lead times and will avoid misunderstandings.

The TSO shall have the right to levee a transaction charge for the transfer of capacity for Assignments and Transfers. This charge is based on actual costs, incurred by the TSO whilst facilitating the transfer. As EU regulation has not yet been fully implemented in all countries of Europe, the TSO’s of these countries might encounter problems surrounding the implementation of the CBP. When national regulation doesn't oblige the TSO’s to implement a web based system, or facilitate secondary capacity trading in general, retrieving the costs for these implementations can be problematic. Therefore the TSO’s will actively encourage the national regulators to implement article 8 of Regulation
1775/2005 and engage in discussions to ensure compliance with EU regulation. The TSO’s will implement the CBP when there are no restrictions put in place by the regulator.

A.1.2 EASEE Gas CBP on Interconnection Agreements

The term ‘interoperability’ is normally used to mean the technical ability to ensure safe flow of gas from one pipeline to another, possibly built with different technical specifications, in a different country, by a different operator. In this respect interoperability has been achieved in Europe generally over the last four decades of development in international trade. Indeed approximately 60% of gas consumed in Europe crosses at least one border. Clearly the traditional methods have been successful in managing cross-border trade safely but additional mechanisms are now being developed to manage commercial operations in a competitive market.

Historically the pipeline systems used to import gas from both outside and inside Europe (from Russia, Algeria, Norway and Netherlands etc) were built in conjunction with gas purchase and sale contracts as the ‘necessary infrastructure’ required to deliver the gas from seller to buyer with no involvement of third parties. Typically the gas supply contract would specify a physical location where ownership of gas would pass from seller to buyer. The seller was responsible for providing the infrastructure upstream of the delivery point and the buyer (or buyers) would be responsible for the infrastructure downstream of the delivery point.

Frequently European gas utilities co-operated to contract for gas in sufficient quantity to justify the development of expensive long distance pipeline systems. For example the extensive pipeline system from Russia was built by Gazprom and its partners in the Eastern bloc countries as far as the Czech German border. Gaz de France and Ruhrgas jointly built the Megal pipeline which transmits the gas to markets in Germany and France. Alongside the gas supply contract there were contracts dealing with interoperability between the Czech system and the Megal pipeline and between the Megal pipeline and the French system.

Historical interconnection arrangements are essentially agreements between two parties who are both owners of the gas (shippers) and owners and operators of their respective pipeline systems (TSOs). There has already been a great deal of progress towards unbundling of the gas undertakings so that the ownership of the pipeline is at least legally separate from ownership of gas, as required by the gas Directive, and as time goes by the number of shippers involved in transit of gas from one pipeline to the next will increase. These developments clearly mean that the historical ‘carrier to carrier’ arrangements for interoperability which were embedded in long term gas supply contracts are no longer a workable model for the new gas market.

As the European market becomes more fluid, the percentage of third party gas will increase. As a consequence, TSOs have started to amend ‘carrier to carrier’ agreements with new Interconnection Agreements which provide standard, flexible, easy-to-manage arrangements for the non-discriminatory treatment of shippers.

Work on Interconnection Agreements has been carried out by industry organisations such as Gas Transmission Europe (GTE) and this has culminated in ‘Common Business Practice’ on Interconnector Agreements which was approved by EASEE-gas in September 2005.
A CBP on Interconnection Agreements was approved in September 2005. The CBP describes the scope of an Interconnection Agreement to be established by two adjacent TSOs, describing how to facilitate interoperability of the grids. It is meant to be applied at all cross-border points and where suitable to all other major interconnection points. Implementation by TSOs was to be not later than 1 October 2006 and progress with implementation is discussed in Section 2.8 below.

The generic term Interconnection Agreement (IA) is used in Europe to define an agreement established between two TSOs, whose systems are connected at a particular Interconnection Point (IP). IA has much the same meaning as Operational Balancing Agreement in North America. However, the CBP also uses the term Operational Balancing Account (OBA) to describe one approach to allocation rules, which form part of an IA, and we will use OBA in the European, rather than the American, sense in the reminder of this document.

The CBP requires that an IA between two TSOs should cover both technical and commercial interoperability issues including the following:

- Matching
- Rules for Flow Control
- Measurement Principles of gas quantities and gas quality
- Gas Quality Specifications
- Allocation Rules
- Co-ordination of Operation
- Information Exchange between adjacent TSOs
- Exceptional Events
- Changes to the IA

Matching

The CBP requires:

- There shall be a description of the exchange of information, based on pairs of shipper codes, needed to arrive at confirmed quantities identical for both TSOs and to enable the TSOs to schedule the flow at the IP.
- Such process shall be based on the quantities as nominated by the upstream and downstream shippers to their respective TSO (for best practise see CBP 2003-002/01), taking constraints into account if applicable
- The result of such matching procedure shall be the confirmed quantities, which shall be communicated to the shippers (for best practise see CBP 2003-002/01).

Some explanation of the matching process is needed in order to understand the CBP. In the integrated industry structure gas flow was managed under carrier to carrier agreements. Communication was necessary between the Control Centres of the upstream and downstream utilities. In the new structure, as a minimum, the gas supply arms of the companies must be unbundled from the TSOs and communications between

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the TSO and affiliated shippers has to be on an arms length basis. Hence, there is a need for coordination between at least four parties (two TSOs and two shippers) if the TSOs are to schedule the correct volume to flow at the IP every day. As the market liberalises and new shippers start to flow gas at the IP, so the number of parties involved at an IP will increase.

In a competitive gas market, the IP is not just the point at which the systems operated by two TSOs physically connect. It is also the point at which various shippers trade gas. For each transaction there will be a seller who is normally a shipper on the upstream system and a buyer who is a shipper registered on the downstream system.

Prior to each gas day the shippers on both pipelines nominate to each TSO the quantities they intend to deliver or receive at the interconnection point. All notices from the shippers have to include information with regard to the receiving or delivering shippers in the adjacent transmission system in order to allow for a matching process. To protect anonymity, nominations at the IP may refer to shippers on the adjacent system using ‘shipper codes’ in place of names.

Ideally, the nominations made by shippers delivering gas at the IP from the upstream transmission system will match nominations of those shippers receiving gas at the IP for flow into the downstream transmission system. In practice this may not always be the case and there needs to be a process for reconciling any differences. Where nominations from pairs of counterparties agree they can be confirmed by both transporters. However, if the nominations made by two counterparties do not agree the transporters will confirm a flow quantity by taking the lower value of the two nominations. The process of nomination and renomination (described below) provides the shippers with opportunities to adjust their nominations before the gas day.

Separate recommendations are available on the process for receiving nominations from shippers to be used in the matching process41 contained in CBP 2003-002/01 makes recommendations on:

- The gas day
- Nomination scheme
- Message Content

Gas Day

The CBP defines the gas day as 06.00 Local Time to 06.00 Local Time on the next day within a given time zone and specific provisions are required for IPs at the interface of two time zones.

Nominations Scheme

The Nominations scheme requires communication between each TSO and its respective shippers and between the two TSOs. It should be clear that TSOs do not have direct communication with shippers on the adjacent pipeline; only with shippers registered on their own system. However, TSOs share information as necessary for the matching process. At present the EDIG@S communication process is widely used for electronic communications in the European gas market. However, backup systems have to be provided in case of communications problems.

It is also agreed that nominations can be sent at all times. However, only the last applicable nomination that was sent before a nomination deadline will be taken into account. This principle is sometimes referred to as ‘buffering nominations’.

The nomination scheme sets out a timetable for shippers to send nominations and renominations to TSOs and for TSOs to send matching notices and confirmation notices to shippers. The time reference used in the nomination scheme is ‘Coordinated Universal Time’ (UTC), which is for practical purposes equivalent to Greenwich Mean Time.\(^\text{42}\) The timings set out in Table 1 refer to the winter period. All times are one hour earlier during the summer-time period\(^\text{43}\). So for example, the first shipper deadline would be at 12:00 during summer time.

**Table 17 Recommended Nominations Timetable**

<table>
<thead>
<tr>
<th>Shipper Deadline</th>
<th>TSO Deadline on D-1</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>13:00</td>
<td>Shippers Submit Nominations to TSOs</td>
</tr>
<tr>
<td></td>
<td>14:00</td>
<td>TSOs send matching notices to their shippers</td>
</tr>
<tr>
<td>2</td>
<td>15:00</td>
<td>Shippers Submit Revised Nominations to TSOs</td>
</tr>
<tr>
<td></td>
<td>17:00</td>
<td>TSOs send confirmation notices to their shippers</td>
</tr>
<tr>
<td><strong>Renominations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>19:00</td>
<td>First Renomination Deadline</td>
</tr>
<tr>
<td></td>
<td>21:00</td>
<td>SOs send revised confirmation notices to their shippers</td>
</tr>
<tr>
<td>4</td>
<td>23:00</td>
<td>Shippers Submit Revised Nominations to TSOs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TSOs send revised confirmation notices to their shippers</td>
</tr>
</tbody>
</table>

* All times are 1 hour earlier during the Summer time period

Source: EASEE-gas CBP 2003-002/01

Shippers are required to submit transport nominations to their respective TSOs for transportation on Gas Day D by the first shipper deadline. All nominations arriving after said deadline will be ‘buffered’ until the next nomination deadline for shippers. Each TSO then has to send a ‘matching notice’ to their respective shippers having submitted a nomination before the First Shipper Deadline. This implies that, between the First Shipper

\(^{42}\) UTC is equivalent to mean solar time at the prime meridian (0° longitude) as defined and recommended by the International Radio Consultative Committee (IRCC), a predecessor organization of the ITU-T, and maintained by the ‘Bureau International des Poids et Mesures’ (BIPM). (CCIR Recommendation 460-4, or ITU-T Recommendation X.680 (7/94), contains the full definition.)

Deadline and the First TSO Deadline adjacent, TSOs exchange information with regard to the nominations received from their respective shippers.

The matching notice includes the last nomination of the shipper, as received by the TSO before the first shipper deadline, without any change being made by the TSO. At this stage shippers also receive information on nominations made by their counterparties to gas sale and purchase deals taking place at the IP. This enables all shippers to check whether or not the nominations made by their counterparties for receipt (or delivery) at the IP agree with their own nominations for delivery (or receipt) of gas at the IP.

In the event that the nominations do not agree one or both shippers have the opportunity to revise or correct their nominations before the second shipper deadline. The second shipper deadline has been added by EASEE-gas in order to allow shippers to correct or revise their nominations. Nominations arriving after the First Shipper Deadline will be considered as nominations for the Second Shipper Deadline.

By the second TSO Deadline, TSOs must send a ‘confirmation notice’ to their respective shippers having submitted nominations before the First or Second Shipper Deadline. The confirmation notice will confirm to the shipper the (hourly or daily) quantities of gas that will be scheduled to flow on Gas Day D. The confirmed quantities will take into account the shipper’s nomination, contractual provisions between the shipper and the TSO, constraints (if any) and the ‘lesser rule’. The calculation of the confirmed quantities will be done by the TSOs between Second Shipper Deadline and Second TSO Deadline.

As a general principle and as a minimum requirement, renominations should be received at the latest two (2) full hours before the relevant hour bar before becoming effective. Furthermore, the number of messages should be limited to the necessary information to be exchanged. As long as there is no new information, no additional message should be sent. However, in order to get a confirmation that a message has been received by the counterparty, an electronic acknowledgement should be requested.

After the initial nomination process, which ends at the Second TSO Deadline, TSOs should allow for renominations in order to handle new nominations or re-nominations that arrived after the Second Shipper Deadline. However, as there is no real need to have a continuous process before the Gas Day and in order to limit the number of nominations, TSOs should allow for at least two additional re-nomination deadlines.

Finally the CBP recommends that TSOs allow Within Day renominations. As from two (2) hours before the start of Gas Day D until three (3) hours before the end of Gas Day D, TSOs will allow for a continuous re-nomination process, taking into account a two (2) full hour lead time as from the hour bar. At the end of this period, TSOs will issue a confirmation notice to confirm the rescheduled quantities of gas for Gas Day D.

The global quantity determined through this reconciliation and confirmation process is described as the ‘Scheduled Quantity’. The Scheduled Quantity is subsequently profiled and scheduled to flow at the interconnection point.

An important aspect of an IA is how constraints are taken into account during the matching process. In CBP 2005-003/01, a Constraint is defined as an unplanned event that, for a certain limited period, causes available transport capacity to be less than the sum of the confirmed quantities. A Constraint may occur when a critical element (e.g. a compressor) in the transmission system has a sudden decrease in availability, resulting in a lower

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transmission capacity across the delivery point. Another example of such an occurrence would be severe pipe damage making it necessary to decrease the pressure in a section of the transmission grid. The TSO operating the affected system shall define the duration and the remaining transport capacity, and shall take immediate corrective actions in order to recover the necessary capacity.

Constraints may also arise due to gas quality problems. When gas is qualified as off-specification (according to the specified limits in the Interconnection Agreement) the receiving TSO is not obliged to accept the gas. The downstream/receiving TSO shall define the quantity of off-specification gas that can be transported, while the upstream TSO, who delivers the off-specification gas, shall take immediate corrective actions in order to bring the gas properties back on spec as soon as possible.

The TSO who has to take action according to the previous paragraphs shall inform without delay the adjacent TSO about the nature, and expected duration of the constraint. Both TSOs shall keep each other informed about all relevant issues and the progress in solving the constraint and about any relevant changes in the magnitude of the constraint.

The TSOs shall stay in close contact with each other in order to mitigate the consequences of the constraint as much as possible. Both TSOs shall cooperate as much as possible in order to solve the constraint in the shortest possible time. Both TSOs shall promptly inform their respective shippers with respect to the relevant interconnection point about the nature and expected duration of the Constraint.

A Constraint may affect the quantities that were confirmed to the shippers before the constraint took effect. A new set of confirmed quantities for each pair of shippers shall be established for the constraint period, and a new matching cycle shall commence. The net flow shall be in accordance with the sum of the new confirmed quantities. The shippers shall be advised about the new confirmed quantities. Any revision of the constraint shall initiate a new matching cycle, which will lead to revised confirmed quantities. Each shipper shall be informed about his changed confirmed quantities as soon as practicable.

The flow control shall be based upon the agreements between the TSOs as a result of their communication about the magnitude of the constraint, in accordance with the previous paragraph. The normal nomination rules as agreed between TSO and Shippers shall apply. Shippers shall not be obliged to re-nominate during a constraint. The allocation of the delivered quantities shall be according to the agreed allocation rules.

Message Content

All notices from the shippers shall include information with regard to the receiving or delivering shippers in the adjacent transmission system in order to allow for a matching process. Information with regard to shippers in an adjacent transmission system can be submitted in a coded way in order to hide the name of these shippers. Issuing of codes will be administered by the relevant TSO.

All notices, being issued by the TSOs, shall have the same structure and shall be composed of two basic sets of information:

A first block of information relates to the shipper in relationship with its TSO:

- for a Matching Notice, issued by the TSO, it will repeat the nomination of the shipper as received by its TSO
- for a Confirmation Notice, it will give the confirmed quantities of gas, including the delivering or receiving shippers in the adjacent transmission system, that will be scheduled to flow by the TSO.

A second block of information relates to information in relation to the shipper, as received by the TSO from the adjacent TSO in relationship with its delivering or receiving shippers towards said shipper.

- for a Matching Notice, issued by the TSO, it will give the accepted nomination of the delivering or receiving shippers as received by the adjacent TSO in relation to the shipper.

- for a Confirmation Notice, it will give the quantities of gas, for each delivering or receiving shipper, that the adjacent TSO is able or requesting to flow towards or from the shipper.

**Rules for Flow Control**

The CBP recommendation on rules for flow control is as follows:

- The TSOs shall ensure that the flow should be as close as possible to targets, based on confirmed quantities.

- The TSOs shall agree on how to handle the flow control at the IP (stating the party who shall manage the steering of gas flow) in order to maintain the accuracy of the flow control.

- Rules for changing flow such as flow transition (where applicable), minimum flow, batch flow and ramp-up or down rates shall be included in the IA. The consequences for shippers’ allocations shall be communicated to shippers in a timely, transparent and consistent manner.

The TSOs need to agree how to handle control of flow both upstream and downstream of the IP to ensure that the actual flow of gas from one system to another is as close as possible to the quantity agreed in the matching process. The IA also needs to include rules for changing gas flows including ramp-up and ramp-down rates.

**Measurement principles**

The CBP recommendation on measurement principles is as follows:

- The measurement principles and methods used for allocation shall be agreed between the TSOs at the IP and shall be in line with the national and international standards and applied consistently by the TSOs.

- They shall refer to the measurement procedure, an agreed accuracy and a quality assurance policy (i.e. technical audit/verification procedures). The adjacent TSOs at the IP shall have the right to attend such audit/verification and shall have the ability to review and comment upon such reports generated as a result of such audit/verification.
c. Steering differences and measurement corrections shall be allocated according to the allocation rules contained in the IA. There shall be consistency between the rules in the IA and the rules detailed in the agreements between TSOs and shippers.

d. Any metering correction should be settled according to the applied allocation rules and handled by the affected parties. A closeout period shall be defined, and after the closeout period, any correction shall be handled by and for the account of the TSOs.

e. The IA shall include description of the exchange of metering data between the TSOs at the IP.

f. Access to calibration or audit reports should be made available to the balancing party(ies), at their reasonable request.

Allocation Rules

The CBP recommendation on Allocation Rules is as follows:

a. TSOs shall ensure allocation rules are consistent at both sides of the IP.

b. There will be a description of the allocation method applied at the IP as well as the fallback methodology to be applied in case of exceptional events.

c. The allocation of the metered quantity shall always be based on the confirmed quantity. The different alternatives for allocation rules shall be one of the following:

- **Operational Balancing Account** ("OBA"), where the steering differences will be allocated to the balancing account of the TSOs. The confirmed quantities will be allocated to the shippers.

- **Balancing Shipper**, where the steering differences will be allocated to the balancing account of the balancing shipper(s). The confirmed quantities will be allocated to the non-balancing shippers.

- **Pro-Rata quantities allocated** rule (in the particular case of contra-flow the quantities allocated to the shippers will be the confirmed quantities in the contra flow direction).

d. It must at all times be clear to shippers which allocation methodology is in operation at the IP. If, for operational reasons a fallback allocation methodology is utilised then all affected shippers should be notified promptly, without delay and as far as possible simultaneously. Full details of the allocation methodologies shall be communicated to shippers when appropriate.

e. A reasonable closeout period shall be adopted for any revision to allocations (in any event not greater than 12 months).
The Parties to an IA intend that the quantity of gas actually delivered and received each day at each Interconnection Point will equal the confirmed quantities agreed as part of the Matching process for that IP. However, in the real world there will be times when the metered flow at the IP will be greater or less than the confirmed quantities and there needs to be clear rules on how this discrepancy will be handled in determining the balancing account of shippers on both systems. This process is known as ‘allocation’.

Before considering the three alternative methodologies provided in the CBP, we consider how the allocation of discrepancies can have a material financial impact on shippers.

Consider the following simplified system consisting of two TSOs with a single Interconnection Point, IP (Figure 2).

Gas enters the system of TSO1 at point A, transfers to the system of TSO 2 at the Interconnection Point (IP) and exists at point D on the TSO2 system. Following the matching process let us say that the scheduled quantity of gas to be delivered by TSO1 and to be received by TSO2, on behalf of their respective shippers, was 100 units. Table 2 shows a hypothetical set of confirmed quantities before the day.

There are three pairs of shippers exchanging gas at the IP in our example. TSO1 is to deliver 80 units of gas to the IP on behalf of shipper A and TSO 2 is to receive 80 units of gas at the IP on behalf of shipper 1. Similarly, 15 units are to be delivered and received for shippers B and 2 and 5 units are to be delivered and received for shippers C and 3.

It should be noticed that at the IP the confirmed quantities for each pair of shippers matches in the sense that confirmed exists from TSO1 (for shippers A, B and C) are exactly equal to the confirmed entries to TSO 2 (for shippers 1, 2, and 3).

Also shown in the table are the entries at A on TSO1 and exits at D on TSO 2 because we want to use this hypothetical example to illustrate the impact that different
allocation methods will have on the balancing accounts of shippers on both systems. We note that, on the basis of the confirmed quantities, each shipper has a perfect balance on the respective TSOs with entry at A equal to exit at B on TSO 1 and entry at C equal to exit at D on TSO2.

Now it is the role of the TSOs, subject to the Rules for Flow Control agreed and set out in the IP, to ensure that actual flow on the Day will equal the confirmed quantities resulting from the matching process on day D-1. However, as already noted, in the real world it is not always possible to achieve this. Now suppose the actual flow through the IP was 103 units. We further suppose that entry at A and exit at D are both equal to the confirmed quantities of 100 units. Physically this could result in a reduction of linepack on TSO1 and an increase in linepack on TSO2.

Taking the system as a whole, the shippers have balanced the volume of gas entering at point A and leaving at point D. Consequently, shippers would not face imbalance charges if the entire system was operated by a single TSO. However, in practice each of the TSOs operates separate balancing regimes and depending on the allocation methodology in the IP, shippers could face imbalance charges in both systems despite being in balance overall.

Against this background we can compare the three allocation rules specified by EASEE-gas, namely:

- Operational Balancing Account
- Balancing Shipper
- Pro rata allocation

**Operational Balancing Account (OBA).**

In this approach the shippers set up an operational balancing account which will hold the (cumulative) imbalance in flows between the two operators. Any discrepancy is allocated to the OBA and Shippers are allocated their confirmed quantities. It is often said that shippers are allocated ‘whole’ meaning that they are allocated the confirmed quantities.

The allocated quantities using an OBA are shown in Table 3.

<table>
<thead>
<tr>
<th>Table 19 Allocation Using an OBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocated on Transporter 1 Exit</td>
</tr>
<tr>
<td>Entry</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>80 Shipper A</td>
</tr>
<tr>
<td>15 Shipper B</td>
</tr>
<tr>
<td>5 Shipper C</td>
</tr>
<tr>
<td>0 OBA</td>
</tr>
<tr>
<td>100 Total Allocated Quantities</td>
</tr>
<tr>
<td>100 Metered Flow</td>
</tr>
</tbody>
</table>

In this case all shippers are protected from risk of imbalance charges in relation to operational problems beyond their control as the imbalance is treated purely as a matter between the two TSOs. Each shipper in this case has an exact balance on both TSOs with
allocation at the entry point equal to allocation at the exit point. The Operational Balancing Account between the TSOs is adjusted at the end of the day to reflect an over-delivery of 3 units by TSO1 to TSO2.

Frequently the imbalances are resolved on a payment ‘in kind’ basis. The TSOs agree to maintain the imbalance account as close to zero as possible. So in the above example, an imbalance account of 3 would be carried over to the next day and under the agreement the scheduled quantity for the next day would be reduced by 3 to attempt to correct the imbalance.

Alternatively the imbalance can be settled in cash terms. This method, known as cash-out, is sometimes used in North America where it is possible to base the cash out price on transparent market prices. However, in Europe where traded gas markets have not been widely developed, in-kind settlement is often the only realistic option.

OBAs are becoming the dominant allocation method at IPs in NW Europe including most of the entry points for Norwegian gas to Europe (excluding UK which uses the Pro Rata method) and along the borders between Netherlands, Belgium, Germany and France. OBAs are used less in Eastern Europe although one example exists at the IP between Ukraine and Slovakia.

OBAs are also used at entry points for LNG in Belgium, France, and Spain.

The advantages of OBAs are:

- OBAs protect shippers from imbalances which occur for operational reasons and therefore are no fault of their own.
- Since they remove the risk of uncertain imbalance charges that can arise with other allocation methods, OBAs lower barriers to entry for new shippers and are therefore helpful in promoting cross-border trading and competition.

Balancing Shipper.

In this case one pair of shippers – usually the shippers with the largest percentage of gas capacity at either side of the IP - takes responsibility for the entire discrepancy, which is allocated to the Balancing Shipper’s account. All other shippers are allocated their confirmed quantities.

In Table 4 below, Shipper A is the Balancing Shipper and receives an allocation of 83 units at point B – an increase of 3 units compared to the confirmed quantity 80 units. This results in an imbalance on TSO1 of -3 units (80 entry – 83 exit). Shipper A may have to pay an imbalance charge but Shippers B and C are allocated whole so do not face imbalance charges.

Shipper 1 is allocated 83 units entry at point C resulting in an imbalance on TSO2 of +3 units (83 entry -80 exit). The imbalances could result in shipper A being penalised on both networks, if the imbalance is outside of the tolerance bands.

Shipper 2 and Shipper 3 are allocated their confirmed quantities and so avoid any imbalance charges.
Table 20 Allocations Using a Balancing Shipper

<table>
<thead>
<tr>
<th>Entry</th>
<th>Allocated on Transporter 1</th>
<th>Allocated on Transporter 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exit</td>
<td>Entry</td>
</tr>
<tr>
<td>80</td>
<td>Shipper A</td>
<td>83</td>
</tr>
<tr>
<td>15</td>
<td>Shipper B</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Shipper C</td>
<td>5</td>
</tr>
<tr>
<td>100</td>
<td>Total Allocated Quantities</td>
<td>103</td>
</tr>
<tr>
<td>100</td>
<td>Metered Flow</td>
<td>103</td>
</tr>
</tbody>
</table>

This approach requires a pair of shippers being willing to offer a balancing service to other, smaller, shippers. This will often be the incumbent gas supplier on either side of the IP. The rationale for such a service is that large incumbent shippers have larger portfolios of gas supply with greater flexibility and also have strong cash flow positions which enable them to manage the risk exposure to imbalance charges. On the other hand new entrants may be deterred from entering the market if they face uncertain imbalance charges in the absence of an OBA.

Pro-rata allocation. Under this approach the discrepancy is allocated to all shippers in proportion to their confirmed quantities.

As shown in Table 5, the discrepancy is allocated between all shippers in proportion to their confirmed quantities. Consequently all shippers are out of balance on their respective TSOs and may have to pay balancing penalties.

Table 21 Allocations Using the Pro-rata Method

<table>
<thead>
<tr>
<th>Entry</th>
<th>Allocated on Transporter 1</th>
<th>Allocated on Transporter 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exit</td>
<td>Entry</td>
</tr>
<tr>
<td>80</td>
<td>Shipper A</td>
<td>82.40</td>
</tr>
<tr>
<td>15</td>
<td>Shipper B</td>
<td>15.45</td>
</tr>
<tr>
<td>5</td>
<td>Shipper C</td>
<td>5.15</td>
</tr>
<tr>
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<td>Total Allocated Quantities</td>
<td>103</td>
</tr>
<tr>
<td>100</td>
<td>Metered Flow</td>
<td>103</td>
</tr>
</tbody>
</table>

The Pro-rata method may be appropriate at IPs which are shared by two or more large shippers. However, in most European contexts the IP is dominated by the marketing affiliates of the TSO and third party shippers account from only a tiny proportion of throughput. The pro-rata method is the least conducive to development of competition since the risk of uncertain balancing charges represents a major barrier to entry for new shippers.

Furthermore, and in spite of progress towards unbundling, shippers are concerned that TSOs continue to discriminate in the favour of their marketing affiliates. Potential entrants are therefore likely to be nervous of the pro-rata system since it means that failure by the TSO to achieve the confirmed quantities at the IP could result in imbalance charges for them.
Co-ordination of Operation

The CBP Recommendation of Co-ordination of Operations is as follows:

*The TSOs shall inform each other in a regular and orderly manner of all relevant matters that might affect the operation of their respective grids (e.g. maintenance).*

This recommendation mirrors the requirement of Regulation 1775/2005 that TSOs should communicate and keep each other informed of relevant matters and events which could impact on grid operation either side of the IP including maintenance periods.

Information Exchange

The CBP Recommendation on information exchange is as follows:

*The TSOs shall agree on the data and reports to be exchanged and the timing and means for the transmission of such data taking into account EASEE-gas recommendations and in any event as soon as practicable.*

Exceptional Events

The CBP Recommendation on exceptional events is as follows:

*In case of an exceptional event, the TSOs will contact each other as soon as possible and coordinate the necessary actions with a view to correcting the event with as minimal effect upon shippers as possible.*

As far as reasonably practicable there shall be consistent and simultaneous communication between TSOs and affected shippers.

Changes to the IA

Finally there needs to be agreement on procedures for modifying the IA if and when such modification becomes necessary or desirable. Shippers should be consulted on any changes likely to impact on their rights and obligations at the IP.

Role of a Matching Agent

A Matching Agent is set up under an agreement between all Shippers delivering gas, and/or receiving gas, at the Interconnection Point. A Matching Agent should be independent of the shippers and can perform both the matching of nominations before the day and the allocation of actual flows after the day.

A Matching Agent may be necessary either because shippers do not have confidence that the TSOs at the Interconnection Point can guarantee confidentiality of information or if one, (or both) of the Transporters at the Interconnection Point does not agree to an OBA due to technical or commercial reasons. Issues related to confidentiality of information or most likely to arise when TSOs are also Traders at the Interconnection Point

A Matching Agent is set up under an agreement between all Shippers delivering gas, and/or receiving gas, at the Interconnection Point. A Matching Agent should be
independent of the shippers and can perform both the matching of nominations before the day and the allocation of actual flows after the day.

As with an IP, matching can be based on the lesser of rule or any other pre-agreed rule. Allocations are usually done on the pro-rata method, but any other method can be applied with agreement of the shippers.

The set up and administration of Agents will require, once off, Shipper resources with respect to legal drafting, meetings and workshops. There is also an additional cost associated with the administration of the Agent, i.e. matching has to be performed on a day to day basis. These administration costs are borne by the Shippers operating at the interconnection point usually on a ‘per-throughput’ basis.

Matching agents have been used in the UK since before the liberalization of the gas industry. Historically the matching agents were employed to allocate gas flows on offshore pipelines which were shared by multiple producers each with separate contracts with British Gas. As the matching agent system was already in place it was natural to adapt them to the new circumstances when the Network Code was introduced.

Implementation of Interconnection Agreements in Europe

A summary of allocation methods currently in use in Europe is included as Table 7. The information is based on a map produced by GTE and published on their website45.

45 www.gie.com
Table 22 Allocation Mechanisms in Europe

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>Belgium</td>
<td>OBA</td>
</tr>
<tr>
<td>Norway</td>
<td>Germany</td>
<td>OBA</td>
</tr>
<tr>
<td>Norway</td>
<td>France</td>
<td>OBA</td>
</tr>
<tr>
<td>Norway</td>
<td>UK</td>
<td>PR</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Belgium</td>
<td>OBA+BS</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Germany</td>
<td>OBA+BS</td>
</tr>
<tr>
<td>Belgium</td>
<td>Luxembourg</td>
<td>PR</td>
</tr>
<tr>
<td>Belgium</td>
<td>France</td>
<td>OBA+BS</td>
</tr>
<tr>
<td>Denmark</td>
<td>Sweden</td>
<td>BS</td>
</tr>
<tr>
<td>Germany</td>
<td>Poland</td>
<td>OBA</td>
</tr>
<tr>
<td>Germany</td>
<td>Czech Republic</td>
<td>OBA+PR</td>
</tr>
<tr>
<td>Germany</td>
<td>Austria</td>
<td>BS</td>
</tr>
<tr>
<td>Germany</td>
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<tr>
<td>Germany</td>
<td>France</td>
<td>OBA</td>
</tr>
<tr>
<td>Germany</td>
<td>Luxembourg</td>
<td>PR</td>
</tr>
<tr>
<td>Austria</td>
<td>Germany</td>
<td>OBA</td>
</tr>
<tr>
<td>Austria</td>
<td>Slovenia</td>
<td>Mix</td>
</tr>
<tr>
<td>Austria</td>
<td>Hungary</td>
<td>OBA</td>
</tr>
<tr>
<td>Austria</td>
<td>Italy</td>
<td>Other</td>
</tr>
<tr>
<td>From</td>
<td>To</td>
<td>Allocation</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Austria</td>
<td>Other</td>
</tr>
<tr>
<td>France</td>
<td>Switzerland</td>
<td>OBA</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Italy</td>
<td>Other</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Italy</td>
<td>Other</td>
</tr>
<tr>
<td>Libya</td>
<td>Italy</td>
<td>Other</td>
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<tr>
<td>UK</td>
<td>Ireland</td>
<td>Other</td>
</tr>
<tr>
<td>UK</td>
<td>Interconnector</td>
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<tr>
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<td>Slovakia</td>
<td>OBA</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Poland</td>
<td>Other</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Hungary</td>
<td>Other</td>
</tr>
<tr>
<td>Belarus</td>
<td>Poland</td>
<td>Other</td>
</tr>
<tr>
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<td>Lithuania</td>
<td>PR</td>
</tr>
<tr>
<td>Czech</td>
<td>Germany</td>
<td>OBA + PR</td>
</tr>
<tr>
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<td>Poland</td>
<td>Germany</td>
</tr>
<tr>
<td>Hungary</td>
<td>Serbia</td>
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<tr>
<td>Slovenia</td>
<td>Croatia</td>
<td>Mix</td>
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<tr>
<td>Yugoslavia</td>
<td>Bosnia H</td>
<td>BS</td>
</tr>
<tr>
<td>Latvia</td>
<td>Lithuania</td>
<td>PR</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Russia (Kal)</td>
<td>PR</td>
</tr>
</tbody>
</table>

OBA = Operational Balancing Account  
BS = Balancing Shipper  
PR = Pro-rata  
Source: Gas Transportation Europe

A.1.4 Harmonisation of the Allocation Information Exchange

In 2006, an issue was raised by a Shipper according to which the current allocation mechanisms at the various interconnection points represented a barrier to the allocation of quantities delivered under Long Term Contracts on one hand and short term trading quantities on the other hand.

The Executive Committee of EASEEgas agreed with the Business Rules Working Group investigating this issue and, if needed, develop a CBP on Allocations. To this end, a Task Force was created in April 2006 within the Business Rules Working Group with a view to harmonizing allocation deadlines and messages. The objective of the Task Force was initially the harmonisation of timings and messages used by all organisations involved in the delivery of gas to improve technical interoperability across Europe.

Due to the complexity of the suballocation mechanisms between Shippers and Traders/Buyers/Sellers, the Task Force decided to focus on the primary allocation mechanisms, i.e. the processes carried out by the TSOS acting as the parties responsible for Allocation, which consists in apportioning the quantities to their respective shippers at an Interconnection Point.

This CBP, strongly linked to the CBP on Interconnection Agreement and to the CBP on the Harmonization of the Nomination and Matching process, is the corner stone on which sub-
allocation mechanisms (timing and messages) will be built. It is envisaged that the Sub-allocation and secondary allocations will be addressed by the Task Force focusing on the operational aspects of gas sales agreements.

A.1.5 Harmonisation of Units

The following units have been approved for use in gas business transactions across interface points. For the purpose of this CBP, interface points are defined as the physical cross-border points where gas sale/purchase/trade may be taking place, but also the business interfaces between gas companies, for example the operational procedure for nominations and confirmations between a TSO and shippers. The CBP to be implemented on or before 1/10/2005.

Units to be used

- **Pressure**: bar
- **Energy**: kWh (with a combustion reference temperature of 25 °C)
- **Volume**: m³ (at 0 °C and 1.01325 bar) (normal m³)
- **Gross Calorific Value**: kWh/m³ (normal m³) (with a combustion reference temperature of 25 °C)

A.1.6 Gas Quality Specifications

With the implementation of a single internal gas market in Europe, the existence of different requirements throughout Europe regarding natural gas quality have appeared to be a potential barrier for interoperability of natural gas networks. These differences in requirements come in multiple forms. Firstly, there is not a unique set of parameters used within Europe for defining the gas specifications. Secondly, values for common parameters may be different from country to country. Finally, in some cases national authorities either approve or specify the gas quality, while in other countries the specifications have been developed by the gas industry. Arrangements will need to be put in place to facilitate interoperability within Europe in such a way that gas quality requirements do not unnecessarily restrict trading at cross-border points.

The 5th meeting of European Gas Regulatory Forum identified in February 2002 the need for rapid and tangible solutions to remove technical obstacles for interoperability of the different natural gas networks and gas qualities. The Forum invited GTE (Gas Transmission Europe) in liaison with relevant stakeholders, to set out an action plan and a time-schedule for solving issues in relation to technical interoperability and to present them at the Forum’s meeting in October 2002.

Awaiting the start-up of an ad-hoc working group within EASEE-gas, GTE prepared a position paper for harmonisation of gas quality specifications and units, which was presented at the 6th meeting of the European Gas Regulatory Forum in October 2002. The Forum agreed on the action plan proposed by GTE and therefore invited EASEE-gas in liaison with GTE, OGP (International Organisation of Oil and Gas Producers) and

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46 Conclusions of the 5th European Gas Regulatory Forum meeting”, Madrid 7-8 February 2002
47 Conclusions of the 6th European Gas Regulatory Forum meeting”, Madrid 30-31 October 2002
consumer/trading interests, to take the lead in facilitating the implementation of the following agreed actions on gas specifications:

"Initiate immediate discussions among all relevant stakeholders (upstream to downstream) of the proposal presented by GTE at the 6th meeting of the Madrid Forum with regard to streamlining interoperability for high calorific gas qualities in terms of

(i) combustion properties;
(ii) Gross Calorific Value and
(iii) additional components.

EASEE-gas shall be the forum for these discussions, which shall include:

- Consistent approach on combustion properties;
- Review the billing arrangements that lead to restriction in the GCV range;
- Agreement on common values on gas specifications (additional components).

The scope for widening gas quality specifications shall also be analysed including cost-benefit analysis and recommendations shall be made if appropriate."

In order to accomplish the European Gas Regulatory Forum action plan, the Executive Committee of EASEE-gas defined the following scope of work:

- Define parameters relevant for harmonisation,
- Agree on common values and/or ranges for gas specification parameters,
- Develop consistent approach on combustion properties,
- Propose billing arrangements that accommodate the agreed specifications, taking into account safety, costs, benefits and the image of natural gas.

Areas for gas quality harmonisation shall be limited to cross border and EU entry points for high calorific gas, including LNG import terminals and excluding areas of production and isolated systems where production, transportation and utilisation are combined. The proposal for the Common Business Practice on Harmonisation of Natural Gas Quality was finalised by the GQHWG on the 14th of December 2004

A.1.7 Edig@s

In 1983, Distrigas in Belgium, Gaz de France in France, Ruhrgas in Germany and Gasunie in the Netherlands signed a document on a standard way of sending and receiving operational data and messages between the dispatching centres. This document was called the GASNETProtocol. Ten years after, beside the four "owners" of the protocol, another 10 companies, national and international, are using this protocol for their data exchange. At the end of 1995 one of the users, Statoil Norway, who experienced first problems raised by a lot of messages to handle, initiated to look for a more international standard for communication. In May 1996, a Workgroup was formed, in which Statoil and each of the owners was represented by one member. The first goal of this Workgroup was to make an inventory of all the messages used, to gather them and to choose an international EDI standard.

At the end of 1996, EDIFACT was chosen as the standard syntax for the development of the Edig@s messages. In 2007, more than 120 companies use Edig@s for their operational requirements with their business partners.

Electronic Data Interchange or simply EDI is the exchange of structured business information between trading partners in an organised, standardised manner, using agreed
communication methods. The major advantage of EDI is that it permits the rapid transmission and comprehension of data from computer to computer, making the control of the commercial activities far more efficient and cost effective. In addition, the ability to exchange information through EDI offers an opportunity for the data to be fed directly into the in-house system application, thereby saving time on data preparation and data re-entry. The elimination of data re-entry, such as a web-based man machine interface, also caters for the elimination of associated errors, the direct transfer of data from one application to another safeguards the integrity of the data.

As the data transmitted is no longer meant to be read by an operator, but is destined to be integrated into the in-house application, this data can be reduced to strictly dynamic data in coded form whenever possible. This caters for compact data transmissions.

Those are only a few examples of the multiple advantages linked to EDI. Properly implemented EDI offers a wide range of opportunities to make business more efficient. At the beginning of Edig@s, EDIFACT has emerged as the global multisectorial standard, which permits to transmit data between partners. The initial versions of Edig@s (prior to Version 4.0) made use of a subset of the EDIFACT syntax with specific “gas” codes. The Edig@s workgroup defined the messages needed for the gas market and developed them to cover the gas companies requirements.

With the new Version 4.0, the Edig@s workgroup has taken the opportunity to introduce XML as an alternative syntax in addition to the existing EDIFACT syntax. The main justification for introducing the XML syntax is that XML has now become the international interchange standard for levels of the IT industry including information exchange. It is better structured and is supported by an extremely large number of software products.

A.1.8 Edig@s Release Periods

EDIG@S has become the de facto electronic message standard used in the exchange of commercial information between Traders & Shippers, TSOs, DSOs and Producers within the European Gas Supply Chain. The EDIG@S standard specifies the business information requirements and the way it must be structured in an electronic document.

The Edig@s standard covers the kernel phases of the dry gas process flow within the European Gas Supply Chain. There have been a number of versions of Edig@s over the years many of which are still in use. The support of multiple versions of Edig@s is both time consuming and costly for the companies that have to deal with a multitude of parties using different versions. The aim of the CBPs is to:

- Recommend the use of the latest version of Edig@s so that the most pertinent functionality and technology is promoted across the industry;
- Rationalise the number of versions that have to be supported;
- Propose a timetable for the transition from older versions to the newer recommendation.
- Diminish the overall costs for the European Gas Industry by reducing the portfolio of different technologies that is required for communication between parties.

The Business Rules Working Group identified a number of processes that required the development of Edig@s messages. The messages in question were developed by the Edig@s workgroup using the EDIFACT syntax. Since that development, technology has advanced and there has been a move from industry to make use of the new technology, XML, rather than EDIFACT. Consequently Edig@s has produced V4.0 Of its electronic documents which supports both the new XML syntax and the older EDIFACT syntax.
The CBPs recommend the use of the current version of the Edig@s protocol (V4.0) for the exchange of sales, infrastructure and service information between parties in the European gas market. It also confirms that the previous version V3.2 shall continue to be supported until V4.0 is replaced by a newer version. It also describes a transition period over which support for older versions (V2.0 and V2.2) will be phased out. In agreement with the Executive Committee the Edig@s WG will from now on support only two versions of Edig@s, the current version and the preceding version. Details of how the process works and how the versions are approved are described in the CBP “Edig@s Release Periods”.

Version 4.0 proposes two different electronic document syntaxes for its implementation: EDIFACT and XML. Up to version 4.0 only the EDIFACT syntax has been supported. The CBPs define a second transition period over which the EDIFACT format of Version 4.0 will be phased out.

The Executive committee of EASEEgas, based on the recommendation of the Edig@s Message, Codification and Maintenance workgroup, is responsible for authorizing the initialization and publication of a new Edig@s version. The Executive committee of EASEEgas, based on the recommendation of the Edig@s Message, Codification and Maintenance workgroup, is responsible for determining the timescale for releasing and retiring Edig@s versions.

A new official version shall be published approximately every 2 years. Each draft version shall be published 2 months prior to release on the Edig@s homepage for comments. On publication, a disposition of comment will be made available. The previous official version will become a supported version. A new version has a 4 year lifecycle (2 official + 2 supported years).

A.1.9 Company and Connection Point Identifier Coding

A specific topic was proposed by Trader & Shipper segment representatives in the middle of 2004: it concerned codes and names used in messages exchanged for gas transport and delivery in systems across Europe. It was pointed out that location points, as well as names of companies and other information, are often referred to by two or more different names, causing duplications and a waste of efforts in management of databases, contracts, etc., with consequent costs.

Consequently a request was made in order to obtain recommended streamlined encodings that could solve this question. This request led the EASEE-Gas Executive Committee to set up the “Codes and Definitions” working group, with the purpose to establish the real encoding needs and to detect a streamlined solution, possibly among standard encodings. In particular the aim of the working group was indicated as follows:

- to achieve a streamlining of codifications to be used in official messages exchanges between Gas Market parties;
- to issue a CBP containing the recommended codifications.

The “Codes and Definitions” working group was given the responsibility of establishing the real encoding needs and detecting a streamlined solution, possibly among standard encodings.

A.1.10 Message Transmission

The section covers the following two Common Business Practices (CBPs):

- 2007/001/01 Message Transmission Protocol
Both of the CBPs have been developed in parallel and are reliant on each other's adoption. The reason that two CBPs have been developed, rather than one combined CBP is largely historic. For practical purposes they should be regarded as a single entity.

EDIG@S has become the de facto electronic message standard for commercial messages between Traders & Shippers, TSOs, DSOs and Producers within the European Gas Supply Chain. The EDIG@S standard specifies the business information and the way it must be formatted as an electronic document. However, it does not specify how the message must be transmitted between the sending and receiving organisations or the data networking protocol. At present there is no common standard for the data network or the way in which EDIG@S messages are transmitted. This means that although it is possible to purchase applications that generate and translate EDIG@S documents, the way in which they must be sent or received depends on how the other party has implemented EDIG@S. This means that in practice it is not possible to implement a single EDIG@S gateway for an organisation as the choice of technology used is typically agreed on a bilateral basis. Today EDIG@S messages are transmitted using X25, Dial-up ISDN and private data networks. Various transmission protocols are used including OFTP, FTP and AS2.

The aim of the CBPs is to:
- Enable organisations to implement a single EDIG@S gateway that can seamlessly communicate with all other organisations using EDIG@S.
- Reduce overall costs for the European Gas Industry by reducing the portfolio of technology that is needed to communicate with each other.
- Support the increased adoption of EDIG@S by simplifying the required technical architecture.
- Increase the security and reliability of EDIG@S messaging to meet current business needs.

Support the transmission of EDIGAS messages in whatever file-based formats are defined in the prevailing EDIGAS standard.
APPENDIX 2 REGIONAL GAS PROJECTS IMPACTING CONTRACTING PARTIES

The majority of the new gas pipelines that are planned to transport gas from Russia or the Caspian region, aiming to enhance EU security of gas supply and diversify from traditional sources, are expected to cross the SEE region. Those projects are of particular interest for ENC Members since they will open the possibility to increase existing sources of gas supply and meet projected increasing demand. A reference of these initiatives and very brief outline information are presented in the following paragraphs:

Turkey-Greece-Italy (TGI) Pipeline:
It is the first independent pipeline of natural gas from the Caspian region to Europe. The project consists of two sections: Greek onshore from Komotini to Thesprotia coast, being developed by DESFA S.A. and the offshore Interconnector Greece-Italy (IGI) 206 km from Thesprotia coast to Otranto (Poseidon Pipeline) to be developed by Edison and Depa. Total capacity will be 11.5 Bcm/y. It should be noted that for the IGI part there is a TPA exempted capacity of 8 Bcm/y (Edison: 6.4 Bcm/y; Depa 1.6 Bcm/y).

Nabucco:
The project is based on a concept backed by EU-US, to transport gas from Azerbaijan and Middle East through Turkey to Central Europe via Bulgaria, Romania and Hungary. The maximum capacity of the pipeline will be in the order of 31 Bcm/y. The company leading the project is OMV-Austria. National companies have been founded in the respective transit countries, however investment decision is yet to be taken.

South Stream:
This project is a result of discussions between ENI and Gazprom, with regards to the extension of Blue Stream. The pipeline will cross the Black Sea from the Russian to the Bulgarian coast and then be directed to Italy and Central Europe through two branches, the latter crossing potentially Bulgaria, Greece, Hungary, Serbia, Slovenia and Austria, in that sense being of particular regional interest. Nevertheless, precise routing, capacity and implementation plan of this pipeline are yet to be decided. The feasibility study will be prepared by Saipem.

White Stream:
The concept was developed by GUEU (USA) and refers to the transmission of gas from Georgia through Romanian or Ukraine to the EU. Sources of gas will be Azerbaijan and Eastern Caspian whereas final capacity may reach 32 Bcm/y. The SEE region could take supply through transmission branches via Romania.

Trans-Adriatic Pipeline (TAP)/Ionian-Adriatic Pipeline (IAP):
The projects are promoted by EGL and refer to the transportation of gas from Middle East via Turkey, Greece and Albania. The TAP will be connecting Italy across the Adriatic, with a capacity of 10 Bcm/y (expandable to 20 Bcm/y) For the IAP there are two scenarios with 5 Bcm/y and 10 Bcm/y capacity respectively.

Both above pipelines will potentially constitute half of the SEE Energy Community Ring (ECR) should it be developed. ECR concept was developed within the SEE gasification study, by overlaying the branch pipelines from each separate major import transmission pipeline, which in some sections form a ring connection.
APPENDIX 3 NEIGHBOURING COUNTRIES WITH EXISTING OR POTENTIAL CONNECTIONS

A.3.1 Greece

Gas market

The National Natural Gas System includes the main high pressure gas transmission pipeline from the Greek-Bulgarian borders to Attica, with a total length of 512 km, high pressure branches of 564 km total length linking the various regions of the country with the main pipeline, the LNG Terminal on the island of Revythousa (with a send out capacity of 1000 m3 LNG/hr and two LNG storage tanks of total a 130,000 m3 LNG), as well as additional facilities and infrastructure that service the entire Gas Transmission System. Annual consumption at present is in the range of 4 Bcm/y, 75% of which corresponds to electricity production, whereas through an upgrade of compressor stations the network can sustain a market of 9 Bcm/y.

Figure 10 Greek Gas System

Source: DESFA
Main features of gas market and present infrastructure are:

**Table 23 Greece: Gas Market and Infrastructure**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2007)</td>
<td>Bcm/y</td>
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</tr>
<tr>
<td>Gas demand forecast 2010</td>
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<td>6.3</td>
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<td>Gas demand forecast 2015</td>
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</tr>
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<td>Gas demand forecast 2020</td>
<td>Bcm/y</td>
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</tr>
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<td>Import capacity</td>
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<tr>
<td>LNG Terminal</td>
<td>Km</td>
<td>≈ 1000</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈ 3800</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td></td>
</tr>
</tbody>
</table>

(*): Source: DESFA

(**): Source: Gas Survey, ECRB, 2008

There is no physical (or contractual) congestion experienced in the NGS, either nationally or on the interconnection points, since the total capacity of the Greek Natural Gas Transmission System is estimated at around 6.5 to 7 Bcm/y per annum, while the existing market size is approximately 4 Bcm/y. For the time being there is no gas transit through Greece.

The table below presents the maximum technical capacity (LF=1) for each import points and contracted ones:

**Table 24 Greece: Import Capacity**

<table>
<thead>
<tr>
<th></th>
<th>Capacity (Bcm/y)</th>
<th>Contracted on long term (Bcm/y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greek-Bulgarian Border</td>
<td>5.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Greek-Turkish Border</td>
<td>7.5</td>
<td>0.75</td>
</tr>
<tr>
<td>LNG Terminal</td>
<td>5.4</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Liberalisation status**

Pursuant to article 28.3 of the Gas Directive (2003/55/EC) and due to the ten-year derogation period granted to Greece in November 1996, the full opening of the market has to be realized three years at the latest after the expiry of the derogation period (i.e. November 2009), subject to the milestones set therein. Some of the major milestones implemented toward transposition with the Directive are:

1. Establishment of the Hellenic Gas Transmission System Operator (HGTSo) in February 2007, under the name of “DESFA S.A.”, being the owner and operator of the National Natural Gas System.
2. Approval and enactment of the Standard Transportation Agreement (STA) for access of third-parties to the Transmission System. The STA includes all necessary provisions for access to the high-pressure grid that will eventually be incorporated in the Network Code, currently under drafting.
3. Additions to the TPA tariffs put into force in March 2006, in order to accommodate the cases of peaking power plants and address potential competition problems in the electricity sector.

Price developments: There is no organized wholesale market for gas and therefore there are no any published data available for wholesale prices. Only the gas distribution companies (EPA) publish their prices for sale of gas to end customers. Transmission
tariffs are set by the TSO and approved by the RAE, under a postage-stamp tariff methodology. There are no transit tariffs yet. 

Market Opening: Currently, gas-fired CHP-generators with annual consumption over 9 Mcm/year and all gas-fired power producers are eligible customers. Eligibility right will be expanded to other customer categories, according to the milestones for market opening set in the Gas Law. Despite the fact that almost 70% of the market is open to competition, the Greek incumbent DEPA S.A. remains, for the time being, the only importer and supplier of natural gas in the country.

Outstanding issues within gas regulation are:

- Network Code: is currently under public consultation procedure. The Code includes among others rules for booking of capacity, capacity allocation, balancing rules etc.
- Model Capacity reservation/transportation agreement in case of creation of new capacity: to be included in the network code

The Regulatory Authority of Energy (RAE), established in 2000, is responsible for regulating the gas sector include among others competencies in tariff setting, licensing, market monitoring, unbundling etc.

**Contractual arrangements-issues affecting the EnC CPs**

Not existing. Currently, the Greek system is only interconnected with the Bulgarian transmission system in the northern border of the country. There is actually no integration between the Greek and the Bulgarian natural gas markets, mainly due to the fact that the pipeline transporting gas to Greece through Bulgaria is a dedicated transit pipeline, exempted from the implementation of a TPA regime which applies to the rest of Bulgarian national network. This is also the case for the transit pipelines upstream of Bulgaria. Also a new interconnection with Turkey is operational since 2007.

However, the recent natural gas dispute between Russia and Ukraine from 6/1/2009 to 19/1/2009 was an opportunity for closer cooperation between the TSOs of the Bulgarian and the Greek natural gas networks. The Greek natural gas pipeline network supported the Bulgarian one (a reverse flow). Gas from the Greek LNG terminal of Revithousa was supplied through the Greek gas network system to Bulgaria during the last two days of the gas crisis, following an official request for assistance from the Bulgarian government. During the 19th and 20th of January, DEPA delivered approximately 2.8 million m3 of gas to the Greek-Bulgarian border.
A.3.2 Hungary

Gas market

Main features of gas market and present infrastructure are:

Table 25 Hungary Gas Market and Infrastructure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>15.6</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>17.2</td>
</tr>
<tr>
<td>Import capacity</td>
<td>Mcm/h</td>
<td>2.2</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈ 5000</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td>≈ 72000</td>
</tr>
</tbody>
</table>

The natural gas imported is primarily of Russian origin. Even the natural gas bought through the HAG line from Gaz de France and from E.ON Ruhrgas is of Russian origin. 18% of the import from the East comes from Turkmenistan. According to the forecast of the TSO the expected gas consumption values in the next three years are:

- 2007: 15.60 Bcm/y
- 2008: 16.00 Bcm/y
- 2009: 16.00 Bcm/y

The current capacity of domestic production and import are as follows:

- Domestic production: 2.75 Bcm/yr
- Import
  - HAG (western direction): 4.42 Bcm/y
  - “Testvériség” (east): 15.33 Bcm/y

The extent of long-term gas supply contracts are as follows:

- Panrusgas: 9 Bcm/y until 2015
- E.On Ruhrgas: 500 Mcm/year until 2015
- Gaz de France: 600 Mcm/year until 2012
- O&G, Eurobridge: 900 Mcm/year until 2008
- Bothli Trade AG: 900 Mcm/year until 2014

There are 5 UGS sites in Hungary with a total capacity to store 3.5 Bcm/y and withdrawal capacity 47.5 Mcm/d. Furthermore and additional strategic storage facility will be constructed by MOL Nyrt, with 1.2 Bcm/y working gas capacity and 20 Mcm/d withdrawal capacity. MOL will start the construction in 2007 in Szőreg in South-Hungary.

The domestic gas transmission pipeline system’s maximum capacities are ensured by the TSO as follows:
Table 26 Capacity of Hungarian Gas System

<table>
<thead>
<tr>
<th>Source</th>
<th>Capacity (10^9 m³/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic production</td>
<td>10.5</td>
</tr>
<tr>
<td>IMPORT HAG</td>
<td>12.1</td>
</tr>
<tr>
<td>Source: Western</td>
<td>3</td>
</tr>
<tr>
<td>Russian</td>
<td>6</td>
</tr>
<tr>
<td>IMPORT BEREGBSZÁSZ</td>
<td>30</td>
</tr>
<tr>
<td>Source: Russian</td>
<td>25</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
<tr>
<td>UGS</td>
<td>47.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.1*</td>
</tr>
</tbody>
</table>

Liberalisation status

The Hungarian Energy Office was created in July 1994 and is responsible for the licensing, administrative control and supervision and the consumer protection in the field of natural gas. The Office is a central administrative body, government office, it is supervised by the Minister of Economy and Transport, and it has substantive tasks and competences. In the framework of its administrative tasks the Office issues, modifies and revokes the licenses in the field natural gas supply, and competence in the regulated transmission tariffs preparation.

Market structure: There is one transmission company, one wholesaler, one storage company, one TSO, 10 distribution companies /public utility supply companies, 3 LPG supplier, 14 natural gas traders, cross-border traders. Wholesale and end-user prices are regulated.

40 % of natural gas market was opened on January 1st, 2004, covering all customers except household. On 1 July 2008 market would be fully opened.

The national gas transmission network is operated by a single TSO (MOL Földgázzállító Zrt.), while 11 regional distribution system operators are active in the distribution systems Directive 2003/55/ was fully adopted by Hungary, through the Act on Natural Gas Supply XLII/2003 (GET) and Act on its amendment LXIII/2005.

Contractual arrangements-issues affecting the EnC CPs

Natural gas flows of the cross-border points:

- Mosonmagyaróvár (West): 8 Million m³/day imported gas for domestic use;
- Beregdaróc (East): 30 Million m³/day imported gas for domestic use + 12 Million m³/day transit towards Serbia.

There are contractual congestions at Beregdaróc eastern cross-border point. The contracts are generally valid for long term. More than 50 % of cross-border capacities are bound by long term contracts. No secondary capacity trade has developed in Hungary, as there is no relevant market demand.
A.3.3 Italy

Gas market

The gas market in Italy is in the 3rd position in the among EU countries in terms of size. Natural gas consumption in Italy is in the range of 84.9 Bcm/y in 2007. Indigenous gas production is was approximately of 11 Bcm/y at the same year falling from 15.5 Bcm/y in 2001, being dominated by Eni which holds the largest quota 80% of natural gas produced. Dependence on foreign suppliers is rising year by year: in 2006 gas imports rose by 5.4% covering 87.5% of consumption. It is expected that domestic production will continue its downward trends and fall to 3.5 Bcm/y by 2020.

Import capacity in 2006 was in the range of 94 Bcm/y rising from the previous year by approximately 3.2 Bcm/y of which to the benefit of access not reserved for long term contracts. At the same year the total demand in the gas sector, expressed as volumes of gas sold on the wholesale and retail markets (including, thus, resale) reached 134.3 Bcm/y.

Main features of gas market and present infrastructure are:

Table 27 Italy Gas Market and Infrastructure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2007) (*) of which:</td>
<td>Bcm/y</td>
<td>84.5</td>
</tr>
<tr>
<td>Residential and tertiary sectors</td>
<td>Bcm/y</td>
<td>28.5</td>
</tr>
<tr>
<td>Industry</td>
<td>Bcm/y</td>
<td>21.4</td>
</tr>
<tr>
<td>Thermoelectric</td>
<td>Bcm/y</td>
<td>34.1</td>
</tr>
<tr>
<td>Losses</td>
<td>Bcm/y</td>
<td>0.1</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>99.5</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (**)</td>
<td>Bcm/y</td>
<td>108</td>
</tr>
<tr>
<td>Gas demand forecast 2020 (**)</td>
<td>Bcm/y</td>
<td>128</td>
</tr>
<tr>
<td>Import capacity</td>
<td>Mcm/h</td>
<td>11.4</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈ 34000</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td>≈ 24000</td>
</tr>
</tbody>
</table>

(*) Source: Snam Rete Gas
(**) Source: SEE Gasification Study
Procurement is based mainly on non EU sources, in particular:

- 35.6% from Algeria (9% LNG and the rest via pipeline with entry to the national network at Mazara del Vallo)
- 29% from Russia, via the Tarvisio and Gorizia entry points.
- 19.5% Northern Europe, via the Passo Gries, 12.1% of which from the Netherlands and 7.4% from Norway.
- 9.9% from Libya through the Gela entry point.

4.1% of import volumes are regassified at the Panigaglia terminal, including those procured from Algeria.

There are 6 entry points for gas imports: Tarvisio, Gorizia, Gries Pass, Mazara del Vallo, Gela and the LNG regasification terminal in Panigaglia. Domestically produced gas is injected at 67 entry points from the production fields or from their collection and processing centres. The gas storage areas are also connected to the transportation network (2 virtual

\[49\] Source: Snam Rete Gas
points of entry). The exit points of the national gas pipeline network are composed of 17 withdrawal areas (that is, territorial aggregations of re-delivery points) generally coinciding with regional administrative borders from 5 interconnection points with international gas pipelines for exports (Tarvisio, Gorizia, Gries Pass, Bizzarrone, Republic of San Marino) and from two exit points towards storage hubs.

**Liberalisation status**

The Gas Regulator (Regulatory Authority for Electricity and Gas), was established in 1995 and its functions include the setting and updating of tariffs and the establishment of the rules on access to infrastructures and on the supply of services relating to transportation, LNG regasification and storage.

With effect from 1 January 2002, transport is subject to legal unbundling from all other gas activities, except storage, which must, in any case, be accounted and managed separately from transport. Storage is subject to legal unbundling from all other gas activities, with the exception of transport. Distribution is subject to legal unbundling from all other gas activities.

Snam Rete Gas is the main Italian operator for the transmission and dispatching of natural gas in Italy and the only Italian operator that re-gasifies liquefied natural gas. The company owns about 96% of transmission lines in Italy and the only plant for regasification of LNG.

**Contractual arrangements-issues affecting the EnC CPs**

There is no interconnection with the 7 EnC Members.

Planning and implementation of new gas import has been in process during the last years. The most important ones to mention are:

- The IGI project with start up expected in 2012. For this project there is an exemption of access to third parties for 80% of the transport capacity for a period of 25 years.
- The TAP project, comprising gas pipeline connecting Italy with producers in the Middle East via Turkey, Greece, Albania across the Adriatic (see par. 4.3).
- The Galsi project, eventually delivering 10 Bcm/y of Algerian gas to Italy via Sardinia, is currently at the stage of preparation of an inter-government agreement between Italy and Algeria.
A.3.4 Slovenia

Gas market

Slovenia is connected with the gas transmission networks of Austria (the Ceršak MRS), Italy (the Šempeter MRS) and Croatia (the Rogatec MRS). In 2006 the gas transmission network consisted of 741 kilometres of pipelines with a nominal pressure of more than 16 bars, 219 kilometres of the pipelines with a nominal pressure of less than 16 bars, 173 metering-regulation stations, 41 metering stations and a compressor station in Kidričev. In 2006 1.09 Bcm/y were transported to customers in Slovenia, while 1.69 Bcm/y were transit.

Figure 12 Slovenia Gas System

The transmission network is heavily used, especially the transmission path in the direction Ceršak–Rogatec–Šempeter. The average monthly utilization of this path was between 78 and 90 percent, and the average daily utilization was just below 97 percent. The transmission path in the direction Ceršak–Rogatec is also heavily loaded, as in the summer months its average monthly utilization was up to 90 percent, while the average daily utilization was up to 99 % . In that context, in 2006 there were 17 expected transmission interruptions covering a total of 125 hours on 237 days of the year. Main features of gas market and present infrastructure are:
Table 28 Slovenia Gas Market and Infrastructure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2006) (*)</td>
<td>Bcm/y</td>
<td>1.1</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>1.3</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>1.5</td>
</tr>
<tr>
<td>Import capacity</td>
<td>Mcm/h</td>
<td>0.6</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈1000</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td>≈3100</td>
</tr>
</tbody>
</table>

The TSO is Geoplin plinovodi, d. o. o., operating as an independent legal entity. Geoplin plinovodi, is owned by Geoplin, d. o. o., which is a supplier of natural gas. Investments in the gas transmission network are carried out on the basis of the long-term development plan prepared by Geoplin for the period 2005–2014. In 2007 most of NG, over to 50%, was supplied from Russia, 30 % from Algeria, and 19 % from Austria.

Liberalisation status

As of 1 July 2007 market is fully opened, according to the provisions of Directive 2003/55. The Energy Agency, established in 2004, carried out the role of regulation at the gas sector. The Agency has among others a decisive role on issuing and revoking licenses, settles disputes, proposes methodologies for transmission and tariff charges (pending governmental approval) and oversees effective unbundling, transparency and competition within the market.

Contractual arrangements-issues affecting the EnC CPs

There is interconnection with Croatia, at the Rogatec metering station.

A.3.5 Bulgaria

Gas market

Bulgaria is a key gas transit country, with around 16 Bcm/y of Russian gas currently passing through the Bulgarian system to Turkey, smaller flows to Greece and even smaller flows to the FYR of Macedonia. Bulgaria’s own consumption of gas is met primarily from imports (around 2.9 Bcm/y), with domestic production, mainly from the Black Sea, contributing the remainder (0.3 Bcm/y). For added security of supply, Bulgaria has 0.45 Bcm/y of storage at a UGS facility at Chiren in its natural gas system. The Bulgarian transmission ring has capacity of 6 to 7 Bcm/y, only half of which is used at present.

Demand is presently around 3.3 Bcm/y and is forecast to grow to 6.3 Bcm/y by 2025. This could be higher if gas is used for power generation, rather than the presently anticipated investments in hydroelectric and nuclear generation. At present, gas demand is roughly evenly divided between district heating, the chemicals industry (principally fertilisers) and households.

Main features of gas market and present infrastructure are:
Table 29 Bulgaria Gas Market and Infrastructure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual gas consumption (2006) (*)</td>
<td>Bcm/y</td>
<td>3.3</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>NA</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>NA</td>
</tr>
<tr>
<td>Gas demand forecast 2025 (ECA study)</td>
<td>Bcm/y</td>
<td>6.3</td>
</tr>
<tr>
<td>Import capacity</td>
<td>Mcm/h</td>
<td>3</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈ 2500</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td>NA</td>
</tr>
</tbody>
</table>

(*) Gas Survey, ECRB, February 2008

Liberalisation status

100 % of the market is open for eligible customers. There are 2 production companies, 1 transmission and 48 distribution companies. The Regulator for Gas is the State Energy and Water Regulatory Commission. On 15 January 2007, Bulgargaz EAD was restructured into BULGARGAZ – HOLDING EAD through unbundling of newly established sole owner trading companies—BULGARTRANS Gaz EAD- is functioning as combined operator, involved in the storage, transit transmission and transmission of natural gas and BULGARGAZ EAD acting as public supplier of natural gas and the related purchase and sale.

Contractual arrangements-issues affecting the EnC CPs

There is one interconnection point with FYROM at Zidilovo.

A.3.6 Romania

Gas market

The Romanian natural gas National Transmission System (NTS) has the following features:

Transmission System
- 12,990 km high pressure pipelines (with diameters between 150 and 800 mm and pressure between 6 and 50 bar)
- 6 compression stations
- Around 1,200 adjusting and measuring stations
- Over 800 cathodical protection stations and 570 gas odorization facilities.

The pipelines were built during 1927 and 2004, and 8,158 km of them, representing 68.89% of the total length, have exceeded the normal functioning duration.

Transit

There are three transit pipelines with a total length of 500 km, pressures of up to 55 bar and diameters of 1,000 mm, 1,200 mm and, respectively, 1,400 mm. Total capacity of these dedicated pipelines amounts to 28 Bcm/y.

In March 2007, there were 2,589,308 gas customers, out of which 2,462,566 were households.
UGS

There are 8 underground storage sites with a total capacity, in 2006, of 2.85 Bcm. forecasted to reach 4 Bcm by 2013.

Main features of gas market and present infrastructure are:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Capacity</td>
<td>Bcm/y</td>
<td>&gt; 30</td>
</tr>
<tr>
<td>Annual gas consumption (2006) (*)</td>
<td>Bcm/y</td>
<td>17.2</td>
</tr>
<tr>
<td>Domestic production</td>
<td>Bcm/y</td>
<td>12.1</td>
</tr>
<tr>
<td>Imports</td>
<td>Bcm/y</td>
<td>5.91</td>
</tr>
<tr>
<td>Gas demand forecast 2010 (*)</td>
<td>Bcm/y</td>
<td>18.1</td>
</tr>
<tr>
<td>Gas demand forecast 2015 (*)</td>
<td>Bcm/y</td>
<td>19.1</td>
</tr>
<tr>
<td>Import capacity</td>
<td>Mcm/h</td>
<td>4.4</td>
</tr>
<tr>
<td>Transmission lines</td>
<td>Km</td>
<td>≈ 13000</td>
</tr>
<tr>
<td>Distribution lines</td>
<td>Km</td>
<td>≈ 32000</td>
</tr>
</tbody>
</table>

(*) Gas Survey, ECRB, February 2008

At present Romania depends entirely on a unique natural gas supplier, namely Russia.

**Liberalisation status**

Market is 100% opened since 1 July 2007 as per Directive 2003/55. ANRE is the responsible regulator for the gas sector after taking all attributions, budget, financing sources, staff and the rights and obligations of the previous gas regulator ANRGN, thus achieving the unification of the two regulatory authorities. Responsibilities of ANRE include: Licensing, Transmission tariffs, Transit tariffs, Market Rules, Dispute Resolutions. Currently regulated third party access is applied. The gas sector has been unbundled in separate companies for exploration, production and storage, transport, transit and dispatching and distribution. The gas sector at present comprises:

- One National Transmission System Operator – SNTGN Transgaz SA Mediaş
- 6 producers: Petrom, Romgaz, Amromco, Toreador, Wintershall Mediaş, Aurelian Oil&Gas
- 3 underground storage operators: Romgaz, Amgaz, Depomureş
- 34 companies for gas distribution and supply to captive customers - Distrigaz Sud and E.ON Gaz Romania are the largest ones
- 76 suppliers on the wholesale market.

**Contractual arrangements-issues affecting the EnC CPs**

There is no interconnection with the 7 EnC Members.

International gas transit is aimed to be developed, with the following overall objectives:

- Developing the transit capacity from the Russia to Bulgaria, Turkey, Greece and FYROM;
Study on Improvement of Interconnection, Interoperability, Transparency and Harmonisation of Operational Rules for NG Transportation in the Energy Community

Final Report

- Upgrading the existing measuring stations of Isaccea and Negru Voda;
- Upgrading the compression station in Cogealac;
- Rehabilitating DN 1,000 mm transit pipeline;
- Setting up on the Romanian territory of transit capacities integrated into the corridor for transmission of gas from the Caspian Sea area to Western Europe;
- Continuing the works on Szeged (Hungary) – Arad (Romania) pipeline with a view at eliminating the dependency on a sole gas source and connecting the NTS to the European gas grid;
- Performing the interconnection on the route Cernăuţi (Ukraine) – Siret (Romania) with a view at improving the supply of natural gas to North-Eastern Romania;
- Developing a new import point, around Negru Vodă, in order to supply gas to Southern Dobrogea.

Current initiatives plans for upgrading the transmission system and improving interconnections and the security of supply and comprise the following projects:

Table 31 Romania Gas Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Length (km)</th>
<th>Cost (Mn Lei)</th>
<th>Deadline (put into operation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interconnection with the Bulgarian transmission system, in Russe – Giurgiu area</td>
<td>8</td>
<td>3.4</td>
<td>2008</td>
</tr>
<tr>
<td>Continuing the works on the Szeged (Hungary) – Arad (Romania) pipeline</td>
<td>2</td>
<td>35</td>
<td>2008</td>
</tr>
<tr>
<td>Romania-Ukraine Interconnection pipeline</td>
<td>41</td>
<td>36.2</td>
<td>2009</td>
</tr>
<tr>
<td>New import point, around Negru Vodă, in order to supply gas to Dobrogea</td>
<td>5.5</td>
<td>5.5</td>
<td>2008</td>
</tr>
</tbody>
</table>

APPENDIX 4 – INFORMATION REQUEST LETTER

ENERGY MARKETS PARTNERS LLP
37 Barnards Hill, Marlow
Buckinghamshire
SL7 2NX, United Kingdom.
Telephone: +44(0) 184 420 2326
Facsimile: +44(0) 184 420 2134
E-mail Address: mikefulwood@aol.com

DATE: ??

Name
Address 1
Address 2
Address 3

Dear ?

ENERGY COMMUNITY STUDY

Energy Markets Partners LLP (EMP) has been engaged by the Energy Community to undertake a Study on Improvement of interconnection, interoperability, transparency and harmonisation of operational rules for natural gas transportation in the Energy Community. The Contracting Parties, as members of the Energy Community, for this study are Albania, Bosnia & Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Serbia and UNMIK.

Of the seven member countries listed above, only four: Bosnia & Herzegovina, Croatia, FYROM and Serbia have existing gas transmission systems in operation. However, all of the other countries are interested in developing gas markets and will be included in the study with the National Regulatory Authority being the main source of information.

The final report to be produced as the outcome of this contract will identify any operational obstacles including technical difficulties to the improvement of interconnection, interoperability, transparency and effectiveness of natural gas transmission in the energy community, with a view to improved gas trade and network utilization. These topics are briefly discussed below.

The final report will also suggest, for each Contracting Party, the main remedial actions that are necessary to remove such obstacles, and suggestions for the harmonization of technical market rules, aimed at increasing market integration and liquidity.

Proposed solutions will be based on those adopted in the European Union and consider, as far as feasible, the best practices of the EU Member States.
The Consultant will investigate the operational developments of gas transmission under Third Party Access in Contracting Parties and the EU Member States with which they are interconnected, with a view to:

- identifying the necessary steps for the full integration and interoperability between neighbouring Contracting Partners and EU Member States;
- promoting good practice in gas transmission and compliance with Regulation on Conditions for Access to the Gas Transmission Networks, Regulation 1775;
- promoting good practice in gas balancing taking into account the relevant ERGEG guidelines;
- promoting the eventual adoption of Common Business Practices defined by EASEE-gas;
- adopting transparent capacity calculation methodologies and their publication, taking into account the relevant ERGEG Guidelines;
- illustrating the necessary methodological improvements to the personnel of transmission system operators and regulatory authorities;
- identifying the main related requirements including network enhancements, metering and other equipment, software, and the necessary personnel training.

Analyze current capacity availability as well as allocation and congestion management methodologies, starting from results of the 2007 Gas Survey, with a view to:

- Describing existing capacity allocation methods;
- Ascertaining to what extent reduced pipeline use is due to lack of demand, capacity reservation by long term contracts, or other causes including upstream difficulties;
- Diversified supplies and increased market liquidity;
- Suggesting remedies aimed at improving existing capacity and its use in the short and medium term;
- Suggesting new methodologies for capacity allocation and congestion management to be included in the new market rules;
- Proposing criteria for harmonisation of the market rules in the Contracting Parties.

Analyze current methods used for balancing transmission networks including resort to storage facilities, with a view to improve the viability of the network and facilitate trading and entry of new suppliers:

- Examine possible alternatives and any difficulties to implement them;
- Propose a roadmap towards more advanced and market-oriented balancing regimes, also considering the ERGEG Guidelines on storage and flexibility services.

In order to undertake this study, EMP will need to collect information on the transmissions system operator (TSO) and the regulatory system. As a consequence EMP intends to arrange visits and meetings with the TSOs and regulatory authorities where Contracting Parties have existing gas transmission networks, which are located in Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia and Serbia. For Contracting Parties that do not currently have gas transmission, the Consultant will gather information submitted by their National Regulatory Authorities by electronic and/or paper means.
There is already a considerable amount of information available on the Energy Community website, including the 2007 Gas Survey report and various presentations by stakeholders from Contracting Parties and sponsors of projects proposed for development in the region. However, further more detailed inputs from the Contracting Parties would be beneficial as soon as possible to reduce the amount of information that will be needed to be gathered during the field trips. We would therefore seek the following information from the Contracting Parties to be sent to EMP prior to, or at, the meetings which will be arranged:

1. Technical operating information on the transmission system, including design capacity of each element of the gas supply system and typical flow rates;
2. System entry points and exit points with associated design capacities and typical ranges of actual flow rates (daily and seasonal variations);
3. Details of interconnection points with neighbouring systems and any Interconnection Agreements in place;
4. Details of metering systems at entry and exit points and how metering data is corrected to standard conditions and transferred to the central control location.
5. Details of facilities and equipment (including software) which are available for the efficient and safe operation and maintenance of the gas system.
6. Procedures relating to the control of the gas system and the balancing of supply and demand.
7. Details of gas storage facilities (including effective capacity and discharge rates) and their modes of operation.
8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.
10. Training programmes for gas transmission system operators and/or regulatory authority personnel.
11. Existing Network Code (if any) with details of nominations and allocations procedures and the gas balancing regime, balancing charges and tolerances.
12. Existing gas transportation contracts, including for internal supply and any arrangements for the transit of gas between neighbouring countries;
13. Details of projects ongoing and/or planned to expand system capacity or to improve system operation;
14. Any regulatory laws, licences, rules and regulations which govern the operation of the transmission system, including any proposals on new initiatives or amendments to existing rules; and
15. Details on tariff structure, methodology and current tariff levels.
16. Policy on transparency. What information is published on your website regarding technical capacity, contracted and interruptible capacity and available capacities and over what time frame. Are tariffs published on your website or in other format.
17. Do you provide a user-friendly tariff calculator for users to determine tariffs for specified routes.
18. Is the above information posted in English as well as the national language?

It would be helpful to receive as much of the information as possible before our planned visits and meetings but, in any event, it would be the purpose of the meeting to go through the information list and also discuss any other issues that may arise.

Replies should be emailed to MIKEFULWOOD@AOL.COM.
Yours sincerely

Mike Fulwood
Energy Markets Partners LLP
APPENDIX 5 – DEFINITIONS

The definitions below are derived from the definitions used in the Regulation.

**Cross Border Entry Exit Capacity:** Capacity, expressed preferably in energy unit or in normal cubic meters per time period, of the natural gas pipeline network at a regional or national boundary, whereby the booked exit capacity from one System is followed by the booked entry capacity into the other System.

**Entry Exit System:** The set of EntryExit points and the pipes that connect these points where the flows are nominated and then measured to serve the equilibrium of DemandSupply inside the Region.

**Primary Capacity:** Capacity, expressed preferably in energy unit or in normal cubic meters per time period, whichever is traded directly by the TSO.

**Region:** For the purpose of the present document, Region is “the geographical area served by the gas transportation pipeline network managed by a single transport operator. This network is connected with the neighbouring regions [networks] with a few and well identified interlink [interconnection] points”. The operator has all the means to fully control flows and pressures inside the network.

**Secondary Capacity:** The total or part of the capacity to which the Shipper is entitled in accordance with the provisions of a transportation contract and which is being traded on the market by this Shipper.

**Shipper:** A network user confirmed as meeting all requirements set by the TSO to get access to the System.

**System:** Any transmission networks, distribution networks, LNG facilities and/or storage facilities owned and/or operated by a natural gas undertaking, including linepack and its facilities supplying ancillary services and those of related undertakings necessary for providing access to transmission, distribution and LNG in any area to which Regulation 1775/2005, PB L 289/3 or any amendment or replacement thereto applies.

**Type of allocation mechanisms**

(a) **OBA**

The allocation of the quantities of natural gas (re)delivered at the Interconnection Point will be equal to the quantities confirmed by the TSO after the matching or validation process and taking constraints into account (Confirmed Quantities), and the difference between the sum of the Confirmed Quantities and the metered quantities will be allocated to a balancing account held between adjacent operators.

(b) **Prorata/Deemed**

Allocation of the quantities of Natural Gas (re)delivered at the Interconnection Point shall be performed by the TSO or the allocation agent, according to the following rules:

- for those quantities destined for delivery or offtake in the direction opposite to the physical flow, the allocation of the quantities to the Shipper will be
equal to the Confirmed Quantities in the opposite direction of the physical flow;

- for quantities delivered or offtaken in the direction of the physical flow, the allocation of the quantities to the Shipper will be equal to the metered quantity increased by the Confirmed Quantities for all Shippers in the opposite direction of the physical flow, multiplied by the ratio of the Confirmed Quantities of the Shipper to the total Confirmed Quantity for all Shippers in the direction of the physical flow.

(c) Balancing Shipper

The allocation of the quantities of natural gas (re)delivered at the Interconnection Point will be equal to the Confirmed Quantities for the nonbalancing Shippers, and the difference between the sum of the Confirmed Quantities and the metered quantities will be allocated to an identified and agreed balancing shipper.
APPENDIX 6 – REFERENCES

3. REPUBLIC OF ALBANIA MINISTRY OF ECONOMY, TRADE AND ENERGY, Gas Forum Meeting, Gas Supply in Albania, 16 April 2008 Maribor, SLOVENIA.
5. STATEMENT ON SECURITY OF SUPPLY BOSNIA AND HERZEGOVINA May 2007.
8. Serbia: Gasification Study prepared by ECA, financed by the WB, Presentation by Branka Tubin, Ministry of mining and energy
16. Gas sector-the process of implementation of the EnCT next steps, 2nd Gas Forum, Maribor, 16 April 2008
22. Updates on the planned South Stream Gas Pipeline project, Program Manager South Stream, 2nd Gas Forum -Maribor –16 April 2008, Carlo R. Meriggi
http://www.erranet.org/AboutUs/Members/Profiles/Bulgaria


27. The Hellenic Gas Network And Regulatory Integration Dimitrios Kardomateas, General Manager for Projects, Regulatory Issues & Strategic Planning Maribor, April 2008


34. ITGI Project, Marco Margheri, Head of EU liaison office Maribor 2nd Gas Forum 16 April 2008.


36. TAP, Opening the Eurasia gas corridor, Naske Afezolli, Head of Gas & Power East-Statoil Hydro, 2nd Gas Forum –Maribor, Slovenia, April 16th, 2008

37. Basic characteristics and current development projects in the gas pipeline system of the Republic of Macedonia, Stanisha Nikolovski, Maribor, 16th April 2008

38. Ionian-Adriatic Pipeline, Goran Frančić, Director of Development Division, PLINACRO, 2nd Gas Forum –Maribor, Slovenia, April 16th, 2008


41. ECRB, National Report BOSNIA AND HERZEGOVINA, Ref: ECRB-S-Version 4, 4 September 2008


APPENDIX 7 ORGANISATIONAL STRUCTURE OF ENC MEMBERS REGULATORY AUTHORITIES
1. Albania – Energy Regulatory Entity (ERE)

- **CHAIRMAN** (1)
- **BOARD OF COMMISSIONERS** (4)
  - Chief Sector for Licensing (1)
  - Chief Sector for Market Monitoring (1)
  - Chief Sector for Licensed Monitoring (1)
  - Chief Sector for Tariff Structure (1)
  - Chief Sector for Price Analysis (1)
  - Chief Sector for Legislation (1)
  - Chief Sector for Customer Protection and Public Relations (1)
- **DIRECTOR of Licensing and Market Monitoring** (1)
- **DIRECTOR of Tariff and Prices** (1)
- **DIRECTOR of Legislation and Customer Protection** (1)
- **DIRECTOR for Human Resources, Administration- Finance and Foreign Relations** (1)
- **Secretary of Board** (1)
- **BOARD CONSULTANT** (1)
- **Finance Specialist** (1)
- **IT Specialist** (1)
- **Services** (4)
2. BiH State Electricity Regulatory Commission (SERC)

ORGANIZATION CHART OF THE SERC

- Commissioner
- Chairperson of the Commission
- Commissioner
- Chief of Staff
- Administrative Secretary of the Commission
- Administrative Secretary
- Interpreter
- Interpreter

- Head of Legal Department
  - Senior Lawyer
  - Lawyer
  - Analyst/Assistant

- Head of Tariff and Market Department
  - Analyst

- Head of Licensing and Engineering Department
  - Engineer

- Head of Financial and Administrative Dept.
  - Administrator/Cashier
    - Docket Clerk
    - IT Operator
    - Logistician/Driver
3. Croatia- Energy Regulatory Agency

[Diagram of the organizational structure of the Energy Regulatory Agency in Croatia, including its managing council and divisions like Electricity Division, Gas and Oil Division, Thermal Energy Division, Legal Affairs and Consumer Protection Division, and Support Services Division.]
4. FYROM ERC

[Diagram of organizational structure]

- **Commission**
  - President
  - Vice-President
  - Commissioner
  - Commissioner
  - Commissioner

- **Departments**
  - Economics Department
    - Head of Department
    - Advisor
      - 1 employee
    - Expert
      - 1 employee
  - Technical-Energy Department
    - Head of Department
    - Advisor
      - 2 employees
    - Expert
      - 2 employees
  - Legal Department
    - Head of Department
    - Advisor
      - 1 employee
    - Expert
      - 1 employee

- **Support Staff**
  - Administrator
    - 1 employee
  - Accountant
    - 1 employee
  - Driver
    - 1 employee
4. UNMIK - ERO

BOARD OF ENERGY REGULATORY OFFICE
5 Members

- HEAD OF OFFICE
- PR OFFICER & PERSONAL ASSISTANT

Technical Advisory Group

- POWER SYSTEM EXPERT
- POWER SYSTEM EXPERT ASSISTANT
- POWER PLANT EXPERT
- DISTRICT HEATING & GAS EXPERT

- HEAD OF ENERGY SUPPLY & MARKET STRUCTURE
- MARKET MONITORING EXPERT

HEAD OF CUSTOMER PROTECTION
- PERFORMANCE STANDARDS ANALYST
- CONTROL EXPERT
- DISTRICT HEATING ASSISTANT

HEAD OF PRICING AND TARIFFS
- Cost & Price
- TARIFF STRUCTURES
- REGULATORY ECONOMIST

HEAD OF LEGAL & LICENSING
- LEGAL & LICENSING OFFICER
- LICENSE MONITORING ANALYST

Departments

- HEAD OF CUSTOMER PROTECTION
- HEAD OF PRICING AND TARIFFS
- HEAD OF LEGAL & LICENSING

Administration Office

- HEAD OF ADMINISTRATION OFFICE
- HEAD OF FINANCE & BUDGET DEPARTMENT
- PROCUREMENT MANAGER
- SECRETARIAT & DOCUMENTATION
- IT MANAGER
- TRANSLATOR
- LOGISTICS & HOUSING

5 Members

HEAD OF OFFICE

PR OFFICER & PERSONAL ASSISTANT
## APPENDIX 8 FIELD VISIT MEETING REPORTS

### CROATIA

<table>
<thead>
<tr>
<th>Information Request</th>
<th>Inception Report</th>
<th>Written Response</th>
<th>Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technical operating information on the transmission system, including design capacity of each element of the gas supply system and typical flow rates;</td>
<td>The transmission system comprises 1657 km of pipelines with diameters ranging from DN 80 to DN 700. The total <strong>theoretical capacity</strong> of the transportation system is 2 Mcm/h. The system includes 151 metering and reduction stations (MRS) with 210 metering points, but no compression stations exist.</td>
<td>Transmission system consists of 2,085 km of the main and regional gas pipelines, 1,659 km of which are 50 bar and 462 km are 75-bar. There are 151 exit measuring-reduction stations with 245 measuring lines and 19 entry measuring stations. At the moment, there are no compressors on the transmission system of Plinacro.</td>
<td>No congestion problems are encountered. Capacity can be raised through the increase of pressure above the existing contracted level of 42 bar</td>
</tr>
<tr>
<td>2. System entry points and exit points with associated design capacities and typical ranges of actual flow rates (daily and seasonal variations);</td>
<td>See Note</td>
<td></td>
<td>The capacity given for Rogatec is the contractual amount and therefore not necessarily the true technical capacity. Typical flow rates at Pula are about 36% of the technical capacity which leaves space for new offshore production fields to be tied in</td>
</tr>
</tbody>
</table>
| 3. Details of interconnection points with neighbouring systems and any Interconnection Agreements in place; | There is interconnection only with Slovenia. The capacity is fully booked until 2017. Plinacro indicates a theoretical capacity of 0.73 MNm3/h at 50 bar starting point and 30 bar ending point. Capacity utilisation over the last years ranges between 74% peaking 99%, though reduced substantially in 2007. Reportedly, since 2006 the Croatian network is also | The only interconnection point is Rogatec towards the Republic of Slovenia. There is still no Interconnection Agreement between two TSOs because INA Plc. is the only user of entry capacity and bearer of the Agreement with the neighbouring operator. | Plinarco were unable to confirm that the capacity at Rogatec is fully booked to 2017 as this is governed by the contract between INA and the Slovenian TSO. However the impression that there is no available import capacity for third parties is possibly misleading in that the “technical capacity” of 210,000
interconnected with Italy’s upstream pipelines in the Adriatic, and is directly fed from Croatian Adriatic fields through the beach terminal in Pula and the new Pula-Karlovac pipeline. Capacity of Pula input point is 0.17 Mcm/h. 16% of Croatian gas supplies were transported through this entry point in 2006. Availability of this route may open up some capacity in Rogatec [42].

At present, only one shipper (INA) uses Rogatec interconnection. Allocation rules are not known but it is understood that they are on a negotiated basis, covering both imported Russian gas and repurchase of gas from Italy as a swap from gas directed to Italy from the North Adriatic Croatian gas.

Plinacro are confident that spare capacity would be available on the Croatian side if requested but it is not clear about the Slovenian side. (See also answer to Q8). The only contractual agreement in respect of Rogatec is between INA and the Slovenian TSO. This does not create a problem under present circumstances of INA having a 100% monopoly of imports but Plinacro recognizes that an Interconnector Agreement would be needed in the event of any third party transportation service being requested at Rogatec.

Some gas fields in the Adriatic are joint venture projects involving INA and ENI. Normal operation is for ENI share of production to be delivered by offshore pipeline to Italy and INA’s share is delivered to Pula. Croatian gas can be delivered to Italy and then returned to Croatia via an alternative pipeline route.

4. Details of metering systems at entry and exit points and how metering data is corrected to standard

Turbine flow meters are being used for measuring of gas flow rate. Correction of standard conditions is being performed by associated electronic volume corrector or flow computers taking in consideration m³/h shown at Rogatec is in fact the contractual value under the contract between INA and the Slovenian TSO.
<table>
<thead>
<tr>
<th>Conditions and transferred to the central control location.</th>
<th>Measured gas temperature, measured absolute pressure and average gas composition. At two entry points, underground gas storage and one exit station flow computers are connected to on-line chromatograph. Registration of delivered quantities at hourly basis is being performed at all exit metering points. Project related to the construction of a system for remote reading of all metering places is in the progress.</th>
<th>The remote metering exercise is expected to be completed within 1 year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Details of facilities and equipment (including software) which are available for the efficient and safe operation and maintenance of the gas system.</td>
<td>National Despatching center is equipped with modern SCADA system made in 2006, which is used to monitor, in real time, the most important entry-exit points of the system with around 95% of realised transport. All relevant nodal points of the transport network as well as all block stations of a newly constructed system of 75 bar pressure are being included in the system. SCADA system is connected to simulation model of the transport network, in a real time, for the construction of a current state of the network, look-ahead and predictive simulation.</td>
<td></td>
</tr>
<tr>
<td>6. Procedures relating to the control of the gas system and the balancing of supply and demand.</td>
<td>• At the moment Plinacro has been executing only one Transport Agreement. The only user of this service is at the same time and owner of the underground gas storage. In normal circumstances, of Plinacro determines working regime of the underground storage in compliance with current state and possible short-term predictions. In case of lack of balance larger than the storage capacity, service user intervenes by itself with its buyers or suppliers. • Development of a number of sub-legislation (Ordinance on the organisation of natural gas market, Network rules of transmission system, Rules related to usage of the gas storage system,...) which are to define the manner of reservation and nomination of the way in which the particular part of the gas system is to be</td>
<td>INA which is the sole importer as well as owner of the gas storage system is responsible for balancing the system. Plinacro’s National Dispatching Centre is responsible for nominating injections and withdrawals depending on existing and anticipated conditions (linepack, pressures) in the system. For larger imbalances INA has recourse to re-nominating flows from/to suppliers and customers. A nomination process for transmission, for different suppliers is missing.</td>
</tr>
</tbody>
</table>
7. Existing gas storage facilities (including effective capacity and discharge rates) and their modes of operation.

<table>
<thead>
<tr>
<th>An Underground Gas Storage (UGS) site exists in Okoli (depleted gas field), which was built in 1987 and has a capacity today of <strong>0.55 Bcm/y</strong>. 50 Mcm are reserved for the Slovenian based Geoplin company. The maximum daily compression capacity amounts to 3 Mcm/day, and the maximum capacity of production is 5 Mcm/day. The maximum hourly compression capacity amounts to around 200,000 m³.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>put into operation in 1987 – capacity 350 million m³, well 17, Qₜ₉=3.8 million m³/day</strong></td>
</tr>
<tr>
<td><strong>present state – capacity 558 million m³, well 22, Qₜ₉=5.8 million m³/day</strong></td>
</tr>
<tr>
<td><strong>working cycles of the storage consists of</strong></td>
</tr>
<tr>
<td>160 production days (October-April) 20,000-240,000 m³/h</td>
</tr>
<tr>
<td>200 days of gas injection (April-October) 30,000-160,000 m³/h</td>
</tr>
<tr>
<td><strong>minimum pressure at wellhead during production of gas from the storage is 50 bar</strong></td>
</tr>
<tr>
<td><strong>maximum (initial) pressure in the storage is 196.2 bar</strong></td>
</tr>
<tr>
<td><strong>middle reservoir depth is – 1.750 m</strong></td>
</tr>
</tbody>
</table>

8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.

| None |


| In compliance with Ordinance on acceptable level of technological loss in process of production of oil and gas (OG no. 72/1999) and Regulations on acceptable loss on ullage, wast, malfunction and | See answer to Question 7 regarding development of Network Code |
| Gas Storage to be unbundled and opened to Regulated TPA. |
| The availability of storage and the contribution of domestic production means Croatia has a relatively high level of Security of Supply, compared to other Contracting Parties. |

8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.

| None |

It is not tested whether the upstream systems in Austria and Slovenia could deliver quantities above the contractual levels, if for example a third party should enter the Croatian market and seek to import spot gas from Baumgarten. Compression station is very close to the border and thus it is noted that additional demand could be solved through increasing network pressure.
breakage on the products in the store (OG no. 57/1998, 81/2002 and 203/2003) acceptable losses are up to 1.5%. In the practice they are in the limits from 0.2 to 0.5%.

10. Training programmes for gas transmission system operators and / or regulatory authority personnel.

| None |

The teams in the TSO and NRA dealing with development of Network Code and implementation of Regulation 1775 have good knowledge and understanding of the issues from involvement in industry working groups and on the job training/learning. Provision of for DSOs and other market participants may be a possibility once the documents are agreed.

11. Existing Network Code (if any) with details of nominations and allocations procedures and the gas balancing regime, balancing charges and tolerances; Methodology for setting balancing charges

Existing network code has been published in OG 126/03 as well as on the Plinacro’s internet page. New network code which is to be in compliance with Regulations on the natural gas market and General conditions for the natural gas supply, is being worked on.

Existing Network Code is based on the current reality that INA has 100% interest in gas import and supply. The new Network Code is expected to be complete by end of 2008 but is not currently available in English. The intention is for Network Code to be compliant with Regulation 1775.

Although the market is legally fully open, HERA does not anticipate the arrival of actual competition in the short to medium term. It is recognized however that it is essential to have the network code in place which would apply in the event of any competition emerging.

12. Existing gas transportation contracts, including for

At the moment there is only one Gas Transportation Agreement with INA Plc. as the
<table>
<thead>
<tr>
<th>Internal supply and any arrangements for the transit of gas between neighbouring countries;</th>
<th>only manufacturer and wholesale supplier on the market. Due to the fact that there is only one interconnection, there is no gas transit on the territory of the Republic of Croatia.</th>
</tr>
</thead>
</table>
| 13. Details of projects ongoing and/or planned to expand system capacity or to improve system operation; | In accordance with approved Plan of development, construction and modernisation of the gas transmission system in the Republic of Croatia from 2002 to 2011, Second development-investment cycle 2007-2011 has been planned:  
- Gas pipeline system Slobodnica – Donji Miholjac – Dravaszerdahely (Hungary) DN 800/75 capacity ~ 6.6 bcm/y  
- Gas pipeline system Bosiljevo – Split – Ploče (DN 800/75 capacity ~ 7.5 bcm/y) with planned extension to the Croatian-Monte Negro border, through Monte Negro to Fieri in Albania (Ionian Adriatic Pipeline Project) – IAP DN 1000/75 capacity ~ 10 bcm/y  
- Gas pipeline system Lučko-Zabok-Rogatec (Slovenia) DN 700/75 capacity ~ 5 bcm/y.  
Activities on evacuation-transmission gas pipelines shall be intensified due to the fact that the Croatian government made decision concerning the location of the future LNG Terminal (Omišalj, Krk).  
Croatian companies will have up to 25% interest in the LNG plant though how that will be split between them remains to be negotiated. |
| 14. Any regulatory laws, licences, rules and regulations which govern the operation of the transmission system, including any proposals on new initiatives or amendments to existing rules; and | Primary Legislation:  
- The Law on Energy ("Official Gazette", No. 177/04, 76/07)  
- The Law on Regulation of Energy Activities ("Official Gazette", No. 177/04, 76/07)  
- The Law on Gas Market ("Official Gazette", No. 40/07)  
Secondary legislation:  
- Grid Code for Access to the Gas Pipeline Transportation System ("Official Gazette", No. 126/03)  
- Basic Market Conditions for Access to Natural Gas Transmission System,  
Consultants have downloaded the Primary Legislation and Tariff documents.  
Copies of the draft new Rulebook and Grid Code not available in English |

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(http://www.plinacro.hr/database/plinacro/akti/PLIN-TTU-03-04.pdf)

- Tariff system for Natural Gas Transportation ("Official Gazette", No. 32/06, 03/07)
- The Decree on Security of Natural Gas Supply ("Official Gazette", No. 112/08)

- Subordinate legislation in preparation process:
  - The Rulebook on the Natural Gas Market Organisation (new)
  - Grid Code for Natural Gas Transportation (new)
  - Tariff system for Natural Gas Transportation (amendments)
  - General Conditions for Gas Supply (new)

15. Details on tariff structure, methodology and current tariff levels.

The methodology for tariff calculation is defined by HERA. Capacity is defined as booked capacity by network users for each period, but it is later revised after actual peak. TSO calculates tariffs which are then approved by the Ministry following opinion of HERA.

- **TARIFF SYSTEM determines**: setting of tariff items for usage of transport system, principles of determination of charge for usage of transport system, actions of TSO and users of transport system regarding settlement of charge for usage of transport system, obligation for measurement of daily loads, procedure for carrying out of final settlement
- **REGULATION METHOD**: based on revenue cap regulation of TSO
- **DETERMINATION OF CHARGE (N)** is equal to all transport system users and is determined by "post stamp" principle. Amount of the charge depends on reserved capacity:
  - \[ N = (\sum QMD_p \times T_p) + (\sum QMD_m \times T_m) + (\sum QMD_b \times T_b) \]
  - \( \sum QMD \) (m³/day) is sum of reserved max. daily load for appropriate months (peak, medium, basic) and \( T \) (kn/m³/day) is tariff item amount for transport for appropriate months (peak, medium, basic). Detailed documents have been downloaded by the Consultants.
o **TARIFF ITEMS for 2008**, prescribed by The Government decision, upon Ministry’s proposal and HERA’s opinion:
- peak load months (January, February, November, December) \[ T_{peak} = 4.99 \text{ kn/m}^3/\text{day} \]
- medium load months (March, April, May, June, September, October) \[ T_{medium} = 4.16 \text{ kn/m}^3/\text{day} \]
- basic load months (July, August) \[ T_{basic} = 2.49 \text{ kn/m}^3/\text{day} \]

- **FINAL SETTLEMENT** is carried out by the TSO each user until 31st of January of the next year at the latest.

16. Policy on transparency. What information is published on your website regarding technical capacity, contracted and interruptible capacity and available capacities and over what time frame. Are tariffs published on your website or in other format.

<table>
<thead>
<tr>
<th>Information published</th>
<th>Final settlement</th>
<th>Time frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information regarding capacity reservation have not been published yet. Project related to construction of information system, which is to provide support to commercial gas transmission management (Gas Transmission Management System) is in the progress. Method of calculation and publishing of information concerning available capacities, in compliance with EU directives, is also to be solved within this information system.</td>
<td>Regulation 1775 being implemented. “Less than 3” rule will apply regarding transparency.</td>
<td>31st of January of the next year at the latest.</td>
</tr>
</tbody>
</table>

17. Do you provide a user-friendly tariff calculator for users to determine tariffs for specified routes.

<table>
<thead>
<tr>
<th>Tariff calculator availability</th>
<th>Tariff system simplicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, being planned</td>
<td>Tariff system is relatively simple postage stamp.</td>
</tr>
</tbody>
</table>

18. Is the above information posted in English as well as the national language?

<table>
<thead>
<tr>
<th>Information availability in English</th>
<th>Information availability in the national language</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, being planned</td>
<td>English versions will not be translate until the secondary legislation is settled.</td>
</tr>
</tbody>
</table>
### SERBIA

<table>
<thead>
<tr>
<th>Information Request</th>
<th>Inception Report</th>
<th>Written Response</th>
<th>Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technical operating information on the transmission system, including design capacity of each element of the gas supply system and typical flow rates;</td>
<td>Length of transmission system (km) 2.140 km Transmission system capacity (cm/h) 540,000 cm/h Volume at operating pressure line-pack (cm/bar) 240,000 cm/bar Year of construction from 1960 to 2008 Year of start up from 1962 to 2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. System entry points and exit points with associated design capacities and typical ranges of actual flow rates (daily and seasonal variations);</td>
<td>See note</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Details of interconnection points with neighbouring systems and any Interconnection Agreements in place;</td>
<td>The whole supply of gas is sourced from the north which makes the whole system relatively unreliable. Total import is realized by JP Srbijagas through one entry point at the Hungarian-Serbian border. Thus the capacity of the interconnection is 13 Mcm/day, with maximum contracted capacity being 11 Mcm/day for Serbia and 1.85 Mcm/day reserved for transit to BiH, as mentioned above. Capacity utilisation was in the range of 52-54% during 2006 and 2007. There are difficulties in using more due to upstream congestion in Ukraine-Hungary.</td>
<td>Connection Hungary-Serbia Metering station Kisundorzyma in Hungary, control station Horgos in Serbia Capacity: 12, 5 Mcm/day (11 for Serbia and 1.5 B&amp;H) Capacity for Serbia a. Contracted capacity = 1.1 x Qyear / 365(366) ship or pay obligations Qyear should be defined 5 years in advance b. Guarantee capacity (from contracted capacity to 10 mcm/day) higher price than contracted capacity should be nominated in Typical value of Qyear is 2.4 bcm so contracted capacity would be 7.2 mcm/day. So guaranteed capacity is 2.8 mcm/day booked on a monthly basis. Further quantities are used for peak supply: Serbia currently has no storage as yet (see Q7). A simple TSO to TSO agreement is in place with process for reading and verifying metered flows. Both at entry point from Hungary and exit point to B-H. Currently only one shipper in Serbia so no need of IA but it is recognized that some form of IA</td>
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</tbody>
</table>
border, as well as lack of flexibility tools so that capacity usage is much lower in summer, taking also into account the absence of a storage site.

<table>
<thead>
<tr>
<th>April for next year in monthly breakdown</th>
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</thead>
<tbody>
<tr>
<td>c. Additional capacity (from guarantee capacity to 11 mcm/day)</td>
</tr>
<tr>
<td>sources for gas: Austrian-Hungarian border, UGS in Hu, production in Hu</td>
</tr>
<tr>
<td>It was rented 0.5 mcm/day as a firm and 0.5 mcm/day as an interruptible capacity</td>
</tr>
<tr>
<td>Connection Serbia – Bosnia and Herzegovina</td>
</tr>
<tr>
<td>Metering station Zvornik in Bosnia and Herzegovina</td>
</tr>
<tr>
<td>Capacity: 2 mcm/day, 1.85 mcm/day contracting capacity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Details of metering systems at entry and exit points and how metering data is corrected to standard conditions and transferred to the central control location.</th>
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<tbody>
<tr>
<td>Natural gas volume is measured with metering devices, which are validated by laboratory for gas, and checked by state institute, which makes them officially appropriate for commercial measurement. At most places metering data are corrected to standard conditions by a device itself. Final data from some (minority) of the metering stations are transferred to central control location by telemetry.</td>
</tr>
<tr>
<td>Metering Station is 10 km inside Hungary. No offtake between meter and the border. Srbijagas representatives visit the meter station with MOL representatives to check readings on regular basis (every three months). Check meter on Serbian side 2 km from the borders.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Details of facilities and equipment (including software) which are available for the efficient and safe operation and maintenance of</th>
</tr>
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<tbody>
<tr>
<td>See note</td>
</tr>
<tr>
<td>New SCADA system for commercial purposes is expected to be implemented with funds from IPA 2009.</td>
</tr>
<tr>
<td>6. Procedures relating to the control of the gas system and the balancing of supply and demand.</td>
</tr>
<tr>
<td>7. Existing gas storage facilities (including effective capacity and discharge rates) and their modes of operation.</td>
</tr>
</tbody>
</table>
and dispatch of the stored natural gas into the gas pipeline system is under construction (5 mcm/day planned capacity). Construction 42 km long two-ways gas pipeline Gospodjinci-Banatski Dvor is also under construction.

8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.

Ukraine – Hungary border bottleneck (10 mcm/day for Serbia). Hungarian TSO announced that this capacity will be increased in 2009. So, it can create conditions to increase capacity on border between Hungary and Serbia. Only one partially interruptions was in winter 2006 (about 20 days in January and February) in last 7 years.


Condition of losses

In order to determine how big the losses at gas transmission system are it is necessary to have metering equipment at all entries and all exits from transmission system. The actual condition of losses at transmission system of PE Srbijagas is difficult to determine considering that there’s no metering at all exits from transmission system (Main metering and Regulation Station - MMRS), so the losses are determined based on quantities estimated by gas transmission and metered quantities at appropriate medium pressure networks.

It is necessary to install meters at

Historically transmission and distribution were vertically integrated and meters were not installed at the offtakes. The programme to install meters is in hand and close to being completed. 90% of daily meters will be installed until the end of 2010.
all takeover points between transmission and distribution in order to increase safety and provide monitoring of gas losses at transmission system. According to our estimations the losses of natural gas transmission in 2007 amount to 1%.

Causes of accrued losses

1. Different accuracy classes of commercial meters at which natural gas is being bought and sold. Takeover is performed according to differential +/- 2% and hand over according to turbine, rotation and diaphragm meters +/- 2 до 3 %.
2. For some MMRS, for part of the exit or for the whole MMRS, there is no metering.
3. Inaccuracy – malfunction of commercial meters. When a meter is broken down it means that it measures more or it measures less in relation to allowed error for that type of meter, or it does not measure at all. (the meters are spent and over 30 years in age)
4. Meters at MMRS very often don't cover the whole consumption scope
| 5. Inconsistency of meter reading time at MMRS |
| 6. Uncontrolled gas loss |
| 7. Controlled gas loss |

Part of gas in GTS is used only for transportation purposes:
1. natural gas preheating in Main Metering and Regulation Stations (MMRS)
2. compressor drive

Line-pack changes, at the beginning and the end of calculation period (+/- pressure change in GTS) implies that in case of pressure increase a part of taken over volumes was left in the system as not handed over and vice versa, and in case of pressure drop more gas was handed over than it was taken over in the observed calculation period.

10. Training programmes for gas transmission system operators and / or regulatory authority personnel.

| AERS had consultant about Network Codes. TSO was partially included. EAR approved Technical Assistance-IPA 2007 program for PE Srbijagas which should start in next few months. This program include: calculating physical capacity of transmission system, technical and market rules |
| Srbijagas is preparing the Network code and they are asking for further technical assistance. |
implementation, advancement of the gas market, inter-operability with transmission systems of neighbouring countries etc.

11. Existing Network Code (if any) with details of nominations and allocations procedures and the gas balancing regime, balancing charges and tolerances; Methodology for setting balancing charges

TSO send nominations to supplier and upstream network TSO every day in this moment. Transmission Network Code is in process of preparation. Nominations, allocations, balancing tolerance will be part of Network Code. Maybe some changes in legislation will be necessary. Methodology for transmission should be changed to include methodology for setting balancing charges. The most exit points from transmission system have not daily meters and it is not connected to SCADA system. TSO also have not adequate IT software for nomination and trade with natural gas and capacity. That causes problems with implementation nominations and allocation procedures for shippers? Open questions are also: procedure for capacity contracts in case when no enough entry capacity, prices for balancing gas when no relevant gas market price and balancing tolerance. Balancing period will be 1 day.

TSO/Agency to provide the Latest English version of the Network Code from March 2008. However it was noted that amendments have been made to the Serbian draft since then including comments from international consultants. There are no plans to translate the current text until it has been finalized. However, the outstanding issues of gas allocation and balancing charges will be addressed in the Final Report of this study albeit in general terms in absence of current proposals.

12. Existing gas transportation contracts, including for internal supply and any arrangements for the transit of gas between neighbouring countries;

Supply contract for Russian and domestic gas are modified every year. It was two contracts with MOL Production (Hungary) for import gas to cover peak demands in last two winter seasons. Transit

TSO/Agency to provide the Latest English version of the Network Code from March 2008. However it was noted that amendments have been made to the Serbian draft since then including comments from international consultants. There are no plans to translate the current text until it has been finalized. However, the outstanding issues of gas allocation and balancing charges will be addressed in the Final Report of this study albeit in general terms in absence of current proposals.
contract with Hungarian TSO is long term contract (1998-2017), but necessary capacity is defined every year. PE Srbijagas TSO have long term contract for transit to Bosnia and Herzegovina (1998-2017). But modifications have made every year.

Srbijagas to provide a map of projects and more detail of timings and capacities of new pipelines.

It was noted that the possible connection between Serbia and Croatia was not mentioned in the Croatia response.

| 13. Details of projects ongoing and/or planned to expand system capacity or to improve system operation; | Options that are being considered / implemented for reinforcement-expansion of the gas system of Serbia include:

  o Interconnections: because of its central position in the region, Serbia could be very important natural gas transit country not only for the region but also on the wider European level. To that end, a few possible gas interconnections are under consideration. One of the most important new investments in this field will be the main gas pipeline Niš-Dimitrovgrad, ensuring an additional route of supply, connecting Serbian gas pipeline system with the Bulgarian system, though at the beginning this would entail Russian gas.

  o Future gas pipelines from Caspian region would enable diversification of gas supply (Iran, Caspian etc.), which would be beneficial to both security of supply and price level. Business plan of PE SRBIJAGAS, Novi Sad for the period 2009-2012 foresees investments in development and investment activities that are to be financed from company’s own funds, National investment plan funds, consumer funds and credit line use.

Speaking of natural gas transmission activity PE SRBIJAGAS has foreseen the following investments:

Bi-directional gas pipeline Gospodjinci – Banatski Dvor. As a part of planned gas pipeline structure, the bi-directional gas pipeline DV 04-18 will connect the main distribution node GRČ Gospodjinci with underground gas storage UGS Banatski Dvor.

distribution gas pipelines in Braničevo district
distribution gas pipelines of Kolubara and Mačva district
distribution gas pipelines of Šumadija district
distribution gas pipeline of Zlatibor district
o **UGS**: This is an essential project enabling flat import profile during the year, and therefore decrease import and transit costs. Potential location for underground gas storage is already defined in Banatski Dvor where significant financial resources were already invested. Storage capacity expected to be 800 Mcm. Peak withdrawal capacity 10 Mcm/day and peak injection capacity 7Mcm/day (source: gas storage Europe. Construction has been completed and trials have been performed.

distribution gas pipeline Bačka Palanka - Bač
distribution gas pipeline SGS Tilva – Bela Crkva
distribution gas pipeline Sremska Mitrovica - Šid
distribution gas pipeline FLOAT-Kovačica
distribution gas pipeline Kula - Odžaci
connection of gas pipeline systems of Serbia and Croatia
connection of gas pipeline systems of Serbia and Republika Srpska

For natural gas transmission management PE SRBIJAGAS foresaw investments into further realization of project for remote supervision and control system and natural gas consumption management (SCADA) as well as into modernization of telemetry system at PE SRBIJAGAS gas pipeline system.

14. Any regulatory laws, licences, rules and regulations which govern the operation of the transmission system, including any proposals on new

You can find in attachment Energy Law. Details about licence you can find on WWW.AERS.RS. We expect proposals for: amendments of Energy Law, secondary.

Some concern expressed by Srbijagas about clarity regarding the separation of responsibilities between shippers and the TSO and which rules should go into the
initiatives or amendments to existing rules; and legislation, tariff structure and methodology and Network Code in way to comply with Directive 2003/55 EC and Regulation 1775/2005. It probably will be in 2009 for 2010. But full implementation of Regulation 1775/2005 will be possible when TSO cover all exit points with daily meters and will have adequate IT solutions to deal with capacity and natural gas trading on daily level.

The metering problem is being addressed and be resolved by 2009. The IT systems are planned to be implemented by 2011.

| 15. Details on tariff structure, methodology and current tariff levels. | Energy undertakings calculate and propose tariffs, the RA provides its opinion and issues methodologies but the final approval of the prices is given by the Government. AERS has published methodologies for the calculation of:

- Transportation systems access and use prices,
- Distribution systems access and use prices
- Natural gas prices for tariff consumers (wholesale and retail)

Transport tariffs are of postage stamp type.

Post stamp tariff. You can find actual tariff structure and methodology in attachment. AERS approved and we expect Government approval for transmission tariff:

a. Tariff rate “capacity charge” = 35,51 dinars/m³/day/year

b. Tariff rate „commodity charge for transmission” = 0,52 dinars/m³

c. Tariff rate „commodity charge for transmission system control” = 0,36 dinars/m³

(An average tariff rate expressed in dinars/m³ = 1,11 dinars/m³)

Notes:

1 m³ = Cubic meter of natural gas of lower calorific value 33,338,35 kJ at 288,15 K (15°C) and pressure 1,01325 bar

Currency rate: 1 US$ = 51,795 dinars upon the 31. August 2008

| 16. Policy on transparency. What information is published on your website regarding technical capacity, contracted capacity contracting procedure and tariff system modification which include interruptible capacity should be implemented | Capacity contracting procedure and tariff system modification which include interruptible capacity should be implemented in Network code and which into the market code. |
and interruptible capacity and available capacities and over what time frame. Are tariffs published on your website or in other format.

2009 together with TSO obligation to publish all information about capacity. Information about gas prices are published (Government approve them 09. October 2008). All tariff elements will be published also.

17. Do you provide a user-friendly tariff calculator for users to determine tariffs for specified routes?

Not yet

Srbijagas will need to do for compliance with Regulation 1775 but the methodology is simple postage stamp basis.

18. Is the above information posted in English as well as the national language?

Not yet

Srbijagas will need to do for compliance with Regulation 1775
### FYROM

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<th>Inception Report</th>
<th>Written Response</th>
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<tbody>
<tr>
<td>1. Technical operating information on the transmission system, including design capacity of each element of the gas supply system and typical flow rates;</td>
<td>The gas system covers a small portion of the territory, consisting of a 98 km pipeline, supply pressure 54 bar, currently serving mostly industrial consumers at the regions of Skopje, Kriva Palanka, Kratovo and Kumanovo. Lack of distribution systems on local level does not allow using the available gas capacity. So far, main gas pipeline branches to the cities with length of 26 km, and distribution gas network with length of 31.5 km have been built. Topliftakacija AD-Skopje is the biggest user of natural gas. No gas storage installation exists. It should be noted that gas distribution networks and plans for a new CHP plant (powered by natural gas) are under construction.</td>
<td>The length of transmission line is 98 km, branches pipelines 26 km, city network 31.5 km and diameter of transmission line is 530 mm. The nominal pressure is 54 bar, but regarding actually low level of the consumption of the natural gas, the pressure now is 42 bar.</td>
<td>Today gas consumers consist of industries and two District Heating (DH) companies. Industries include metallurgical plants, breweries, chemical etc. GA-MA will provide a list with the consumers which will include their capacities/gas consumption. In principle even the industrial customers use gas mostly for heating. Annual consumption is in the range of 100 Mcm, however with the incorporation of the two new CHP stations that are planned (until 2012-2013) full capacity will be utilized. DH accounts for about 50% of gas consumption (50 Mcm/year) serving 50,000 residential and 2-3,000 commercial customers. Installed capacity is about 500 MWth.</td>
</tr>
<tr>
<td>2. System entry points and exit points with associated design capacities and typical ranges of actual flow rates (daily and seasonal variations);</td>
<td>Total capacity of transmission system is 0.8 Bcm/year and available input capacity is 1.2 Bcm/year (with construct ring of compressor stations).</td>
<td>There is a significant seasonal variation in gas consumption since most of the gas is for heating purposes during winter. Capacity of the system is 0.8 Bcm/year with the use of one compression station (CS) at the Bulgarian side. With the utilization of the 2nd CS capacity can reach 1.2 Bcm/year.</td>
<td></td>
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<tr>
<td>3. Details of interconnection points with neighbouring systems and any interconnection with the Bulgarian system, through the single gas transmission pipeline.</td>
<td>Interconnection with the Bulgarian system, through the single gas transmission pipeline. In this moment only Makpetrol AD Skopje (share holding company) has license for supplier of tariff</td>
<td>There are annual contracts signed between Makpetrol – the sole gas supplier- and Gazprom. No further...</td>
<td></td>
</tr>
<tr>
<td>Details of metering systems at entry and exit points and how metering data is corrected to standard conditions and transferred to the central control location.</td>
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| There are one main metering station MMS on the border with Bulgaria (in Zidilovo), five GMRS main metering regulations station (in Kriva Palanka, Kratovo, Kumanovo and two of them in Skopje) and about thirty metering regulations station for consumers which are connected on transmission system. Entry point MMS (main measure station) Zidilovo:
- flow in working conditions : UZM 10” ANSI 600
- pressure, temperature: transmitters
- referent density : two liner SG 3096
- gas texture: two liner gas chromatographs
- volume correction: counter flow computers
- transmission to control room: HART, antilog and Ethernet. The metering system at the border has been installed recently (3 years ago) and is quite sophisticated (ultrasonic). Gas quality is monitored regularly and protocols are signed daily together with a permanent representative from Gazprom. Distance of the metering station from the border is 8 km. There is no GMRS at the Bulgarian side. There is no off take of gas between border and metering station. Each month checking and verification of the system is carried out. |

<table>
<thead>
<tr>
<th>Details of facilities and equipment (including software) which are available for the efficient and safe operation and maintenance of the gas system.</th>
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</table>
| It is planned to install a software for on-line following the system. There is no remote metering but plans to install a relevant system have been initiated. In general, investments for the upgrading of the gas system that have been planned are:
- Refurbishment of 15 low pressure stations in Skopje |
6. Procedures relating to the control of the gas system and the balancing of supply and demand.

- Balancing is made only through line pack.
- It is planed to install a software for on-line following the system.

7. Existing gas storage facilities (including effective capacity and discharge rates) and their modes of operation.

- Storage capacity does not exist.
- Not existing and no plans to construct any.

8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.

- No interruptions are encountered since gas consumption is significantly lower than the overall capacity. However in some occasions during peak gas usage in Greece during winter, pressure falls but this problem is fixed shortly through the utilisation of the 2nd CS in Bulgaria.
- Still now, we haven’t any problem with providing natural gas by Bulgargas side.


- There are:
  - technical losses (natural gas for technical needs and no control expiring)
  - salient condensate
  - mistakes in metering.
- Losses are in the range of 1%, whereas the technical limit is 0.3%. The reason for this is aged equipment, particularly leaking valves. In addition, measurement accuracy is not at an optimal level. Whilst at the border uncertainty is just 0.2-0.5% downstream.
- and increase of their capacity
- Reconstruction of the 3rd metering line at the border station. Now there is one operational line plus a spare, however the obligation is for 2+1
- Installation of SCADA which will allow also for the calculation of unaccounted gas losses. Those projects will be completed by 2010. Budget has already been allocated.
| 10. Training programmes for gas transmission system operators and / or regulatory authority personnel. | For transmission system operator, still now are involved training programs in Russia, Italy, Germany, and United Kingdom. Again it is plane training programs in Italy and United Kingdom. For regulatory authority personnel, still now are involved summer school program which IS organized by ERRA (Energy Regulators Regional Association) in Budapest. | Training has been targeted mostly on technical matters, i.e. operation of equipment for technical staff. Further capacity building on effective regulation is missing. |
| 11. Existing Network Code (if any) with details of nominations and allocations procedures and the gas balancing regime, balancing charges and tolerances; Methodology for setting balancing charges | There is Network Code in final faze, which is proposed by transmission system operator GA-MA AD Skopje and approved by energy Regulatory Commission of The Republic of Macedonia. | Network Code has been elaborated by GA-MA and is now at the final stages. At present comments from Energy Community are being expected. It is anticipated that the Code can be ready by 15 November 2008. It has been also noted that the Code will comprise provisions allowing full compliance with Regulation 1775. It will entail full details and quantitative provisions, and address also balancing, capacity allocation etc. |
| 12. Existing gas transportation contracts, including for internal supply and any arrangements for the transit of gas between neighbouring countries; | There is contract for transmission on natural gas between Makpetrol AD Skopje (supplier) and GA-MA AD Skopje (transmission system operator). Contract between Makpetrol AD Skopje like supplier and | See question 3 |
13. Details of projects ongoing and/or planned to expand system capacity or to improve system operation;

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<tr>
<td>Several expansion projects are being planned by the Government aiming to:</td>
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<td>indirect connection with the main gas pipelines in the region and use of the natural gas for electricity production. The most important are:</td>
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<tr>
<td>○ Chp thermal power station – ENERGETIKA in Skopje, involves re-adaptation of the existing TPP currently using fuel oil with natural gas. Its installed capacity would be 300 MW electric power and 150 MW heating power. It will produce 2000 GWh electricity and 500 GWh heat annually.</td>
</tr>
<tr>
<td>○ Gas pipeline: Klecovce–Veles–Stip–Negotino The project presents a plan for further completion of the secondary pipeline network and supply with gas of several towns: Sveti Nikole, Veles, Shtip, Kochani, Gradsko, Demir Kapija, Negotino and Kavadarc with natural gas. The total length will be 101 km, capacity of 286 Mcm annually with additional 400 Mcm if TPP Negotino is connected to the system. The total costs are estimated to be</td>
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</table>

1. Chp plants: TE-TO will be finished in 2009, capacity is 220 MWe and 160 MWth. The ELEM plant, located at a steel industry, is under the government. Its capacity will be approximately 300 MWe and 300 MWth. Completion is expected for 2012-2013. Contracts for the connection of the pipelines for those projects have been signed.

2. Data provided for the pipeline to Negotino in the inception report is correct. The project was designed with a primary target to supply gas to a 210 MWe power plant built to serve a local Nickel production industry. However following the change of ownership of the latter, this maybe not feasible anymore.

3. Data provided for the pipeline to Tetovo in the inception report is correct.

4. Pipelines to Strumica-Albania, UNMIK and Serbia are also under consideration. The latter is noted to be an important expansion project, constituting part of the EC Ring and allowing a potential supply from Serbia through counter flow, in future.

5. Gas Ring of Skopje implementation depends on the...
40 MUSD

- **Gas ring around Skopje** (the two latter were planned to be initiated within 2008)

- **Gas pipeline Skopje – Tetovo** and gas distribution in Tetovo. It is the missing infrastructure from the Energy Community Gas Ring on the territory of FYROM and an extension pipeline of the main transmission line from Skopje to the Albanian border with connection branches towards Debar, Struga and Ohrid. Length of the pipeline is 48 km, annual consumption 0.35 Bcm/y and cost around 20 MUSD.

- **Gas pipeline** connection to the south part- (Bulgaria) – Strumica (annual consumption 0.075 Bcm/y). This pipeline will be connected to the south branch of the already existing transmission pipeline that goes from Sofia to Petrich, using the same Russian gas as the existing pipeline in FYROM. The length of this transmission pipeline will be only 25 km on FYROM, with a cost of 21 MUSD.

The gas pipeline projects are expected to be funded primarily through concessions

connection to the 3rd DH plant of Skopje, which currently is not gasified. This plant is located about 10 km from the existing pipeline.

For all the above projects (2-5) there are no actual plans for implementation.

In addition feasibility studies for gas distribution in several cities have also been made (Skopje, Kriva Palanka, Tetovo etc.) but no further progress is recorded.

General comment: Pre-feasibility or feasibility studies for gas expansion have been performed quite some time ago (20-25 years ago), but no additional procedures developed since, whereas the results of many of those studies are not relevant. Decisions are mostly dependent on the Ministry of Economy.

Relevant important studies that are deemed to result in a clear focus on technically sound and viable expansion projects are: the New Energy Strategy to be finished in 2009 and a new feasibility study for the development of natural gas in the country which has been launched (open tender) and is expected to start soon.

14. Any regulatory laws, licences, rules and regulations which

<table>
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<tr>
<th>Secondary legislation:</th>
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<tbody>
<tr>
<td>1. Rulebook on the method and</td>
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<tr>
<td>By the end of 2008 all above</td>
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<td>documents will be available in</td>
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15. Details on tariff structure, methodology and current tariff levels.

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<tr>
<th>Details</th>
<th>Conditions</th>
<th>English.</th>
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<tbody>
<tr>
<td>Tariffs for transmission, supply and total price for natural gas are regulated and set by the Energy Regulatory Commission (ERC). The Import price applies at the border with Bulgaria. The transmission price is based on principle of &quot;postage stamp&quot;. Given the small size and lack of congestion, supply regulation is very simple. The allowed tolerance limits for transmission contracted quantity of natural gas are +/- 30%. If a shipper (supplier or eligible customer) transports at least 30% more than the contracted quantity of natural gas per year, the transmission tariff is increased by 1%. If the shipper transports 70% or less of the contracted quantity of natural gas per year, he must pay 70% of contracted quantity per year. A VAT rate of 18% applies.</td>
<td>conditions for regulating transmission, distribution and supplying of natural gas prices, 2. Tariff system for transmission of natural gas, 3. Tariff system for supplying the consumers which are connect on the transmission system, 4. Rulebook on the method and conditions for issues changes and revokes of the licenses. 5. Grid code on transport of natural gas is already finished.</td>
<td>There is one tariff for all customers. Tolerance is now at +/- 30% but those figures have been modified in the Network Code.</td>
</tr>
</tbody>
</table>
Energy Markets Partners-LDK Consultants

- conditions for continuous and safe supply, with natural gas;
- conditions for continuous and successful operation of the companies by determining a level of regulated return on capital;
- the future development of the companies by regulation based on incentives for improving productivity and efficient operation;
- improvement of the quality of services provided by the companies;
- stable and anticipated natural gas market relations, providing favourable conditions for attracting investors;
- conditions for sustainable development;
- conditions for applying the principles of objectivity, non-discrimination and transparency.

In regulating prices, the methodology based on incentive price regulation is applied by the price cap method. The price cap method means establishing a price adjusted to cost fluctuations, ensuring sufficient revenue to cover justified expenses.

In November 2005, the ERC issued the 'Tariff system for transport of natural gas (Official Gazette of the RM, no. 94105). With this Tariff system, the tariff elements and the method for determining the price for the transport of the natural gas are described.
16. Policy on transparency. What information is published on your website regarding technical capacity, contracted and interruptible capacity and available capacities and over what time frame. Are tariffs published on your website or in other format.

Rulebooks and Tariffs are published on website of The Energy Regulatory Commission of FYROM (www.erc.org.mk) and in Yearly Book of activities of The Energy Regulatory Commission of FYROM. See question 14. GA-MA website under construction.

17. Do you provide a user-friendly tariff calculator for users to determine tariffs for specified routes

No

NA
<p>| <strong>18. Is the above information posted in English as well as the national language?</strong> | <strong>Most of them are in Macedonian language and some of them are in English (Grid Code).</strong> | <strong>By the end of 2008 the Code and Rulebooks will be available in English.</strong> |</p>
<table>
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<th>Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Technical operating information on the transmission system, including design</td>
<td>Total length of the gas transmission system is 191 km. There are 7 metering stations,</td>
<td></td>
<td>16” diameter system; max design pressure 50 bar, current working pressure 30 bar (loss from Serbian compression near Belgrade). Max design capacity 1050 mcm / year, current effective capacity 650 mcm / year. Current flow is 400 mcm / year. System has no compression.</td>
</tr>
<tr>
<td>capacity of each element of the gas supply system and typical flow rates;</td>
<td>12 block stations and 4 cleaning stations at the transport system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. System entry points and exit points with associated design capacities and typical</td>
<td>One entry point at Sepak on Serbian border. Capacity at that point is same as for system. System is highly seasonal. Max month is 3.5 time min month.</td>
<td></td>
<td></td>
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<tr>
<td>ranges of actual flow rates (daily and seasonal variations);</td>
<td></td>
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<tr>
<td>3. Details of interconnection points with neighbouring systems and any Interconnection</td>
<td>Currently there is only one interconnection with the Serbian gas system.</td>
<td></td>
<td>Interconnection with Serbia at Sepak. No effective Interconnection Agreement. BH Gas has transportation agreement with Sribijigas for transit (which also covers the Gas Promet system in Republic Srbaska), while Gas Promet has “metering” agreement with Sribijigas. BH Gas pays Sribijigas for transportation and Sribijigas pays a proportion of this to Gas Promet</td>
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<tr>
<td>Agreements in place;</td>
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<tr>
<td>4. Details of metering systems at entry and exit points and how metering data is</td>
<td></td>
<td></td>
<td>Border Metering Station is at Zvornik operated by Gas Promet. Read on a daily basis (at 8.00 a.m.) by Gas Promet and information relayed to BH Gas and Sribijigas. Monthly readings taken by representatives from all 3 entities. BH Gas has Metering Station at Kladanj where its system begins.</td>
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<td>corrected to standard conditions and transferred to the central control location.</td>
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5. Details of facilities and equipment (including software) which are available for the efficient and safe operation and maintenance of the gas system.

| BH Gas as partial SCADA system and central dispatching and control centre. Flow can be controlled via valves (manual and automatic). Gas Promet has no control centre and would have to rely on valve control to affect flow. |

6. Procedures relating to the control of the gas system and the balancing of supply and demand.

| Supply and demand largely balanced through linepack. On very cold peak days (maybe 2 or 3 days a year) BH Gas can interrupt big industrial customers who can switch to alternative fuels. |

7. Existing gas storage facilities (including effective capacity and discharge rates) and their modes of operation.

| No existing gas storage facilities, but there is potential for BH Gas to develop salt cavity storage. |

8. Details of any difficulties concerning upstream bottlenecks and/or interruptions to gas supplies.

| System capacity is effectively determined by delivery pressure from Serbian system. On peak days flow may not be sufficient to meet all customer demand. Further upstream there are bottlenecks at Ukraine-Hungary border, although MOL plans to increase Hungarian capacity. |


| Problems with theft and valve leakages have largely been resolved on both BH Gas and Gas Promet. |

10. Training programmes for gas transmission system operators and/or regulatory authority personnel.

| Technical knowledge is fine but in both BH Gas and Gas Promet there was seen as an urgent requirement for regulatory and commercial training and assistance for the new gas industry structure, specifically related to the circumstances in BiH. |

11. Existing Network Code (if any).

<p>| BH Gas has no Code. Gas Promet |</p>
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<th>with details of nominations and allocations procedures and the gas balancing regime, balancing charges and tolerances; Methodology for setting balancing charges</th>
<th>has Code in draft form.</th>
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<tr>
<td><strong>12. Existing gas transportation contracts, including for internal supply and any arrangements for the transit of gas between neighbouring countries;</strong></td>
<td>BH Gas currently is a bundled sales and transportation operator with no shippers on the system. BH Gas has transportation/transit agreements with Hungary and Serbia TSOs, buying gas from Gazprom at the Ukraine/Hungary border. There is an “implicit” transportation agreement between Serbian TSO and Gas Promet whereby Gas Promet receives a share of the transit fee Sribijagas receives from BH Gas.</td>
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<tr>
<td><strong>13. Details of projects ongoing and/or planned to expand system capacity or to improve system operation;</strong></td>
<td>The following expansion projects are planned:</td>
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<td>o Transport gas pipeline from the existing system in Zenica to Bosanski Brod, with an approximate length of 120 km and capacity 1-1.5 Bcm/y. This project shall allow new input of natural gas to BiH through Croatia and on the long-term basis, a possibility for diversification of sources connecting the transport system of Bosnia and Herzegovina to Croatian system.</td>
<td>o Main projects involve further gasification of BiH. Recognition that compressor station will be required in BiH to expand capacity but difference of opinion between BH Gas and Gas Promet as to whether it should be at Zvornik or Kladanj. Potential projects also for new system entry points on northern border with Croatia and southern border near Mostar (dependent on TP or IAP). Also possibly separate system entry on western border. Ultimately system expansion may depend more on more capacity being available through Serbia, possibly as a result of Nabucco and/or South Stream.</td>
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<tr>
<td>o The construction of the gas network as well as expansion of the existing gas network</td>
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into the region of municipalities of Zvornik and Sarajevo. An expansion project in Republika Srpska is planned to be constructed through Semberija, Posavina and Krajina. This gas pipeline shall be connecting the towns of Bijeljina-Brcko-Modrica-Derventa-Prijedor-Laktasi-Banja Luka-Prijedor-Novigrad, with their spreading towards the towns of Ugljevik, Samac, Bosanski Brod, Doboj, Gradiska thus all major economic and urban centres shall be connected. Concession was been awarded by the Government of RS. The mentioned project shall also provide expansion of the gas network towards the territory of FBiH, i.e. construction of main line from Doboj to Zenica and Tuzla, which shall enable gasification of BiH. Technical characteristics of the mentioned gas pipeline are as follows: capacity of 1.2 Bcm/y, length 300 km, length of shanks of all sections 156 km. The gas pipeline would be connected to the transport system of Serbia near Zvornik or Bijeljina, and later to the transport system of Croatia, shall provide diversification of directions of supply BiH with natural gas.
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<th>Question</th>
<th>Response</th>
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<td>14. Any regulatory laws, licences, rules and regulations which govern the operation of the transmission system, including any proposals on new initiatives or amendments to existing rules; and</td>
<td>Gas Law has been passed in Republic Srbaska and regulatory authority set up. No gas law has been passed in Federation and no prospect as yet of progress on unbundling or establishment of regulatory authority.</td>
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<tr>
<td>15. Details on tariff structure, methodology and current tariff levels.</td>
<td>Prices are dictated by the contract with the supplier (from the Russian Federation), by transport (through Ukraine, Hungary and Serbia) expenses and distribution expenses. No access tariffs are available. End user prices are currently regulated by the Ministry and by local authorities, as integrated supply tariffs. However the wholesale and distribution/retail components are singled out whereas the wholesale component includes the transport cost. Transportation tariff is embedded in the wholesale price that BH Gas charges the distribution companies and large industrial customers. Prices to large industrial customers are negotiated while the charge to distribution companies is effectively regulated by Minister and the cantons. BH Gas have to justify all elements of this charge – gas price paid to Gazprom, transit costs in Hungary and Serbia and its own transportation and supply margin.</td>
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<tr>
<td>16. Policy on transparency. What information is published on your website regarding technical capacity, contracted and interruptible capacity and available capacities and over what time frame. Are tariffs published on your website or in other format.</td>
<td>Little or no information on website.</td>
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<tr>
<td>17. Do you provide a user-friendly tariff calculator for users to determine tariffs for specified routes?</td>
<td>Not applicable</td>
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<tr>
<td>18. Is the above information posted in English as well as the national language?</td>
<td>Not applicable</td>
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