

**Implementation of an Entry/Exit Model
for the East-Baltic Gas Market**

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Final Report

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0 Preface

This study is prepared as part of the **specific contract** between the European Commission and Hydroplan GmbH dated 26th November 2010 for the Consultancy Services “A Study on the Implementation of an Entry/Exit Model for the East-Baltic Gas Market” with identification number TREN/R1/350-2008 Lot 3.

0.1 Objectives of the study

The **overall objective** of this study is to support any national and international activities in integrating the East-Baltic gas market to the EU gas markets¹ in order

- to improve security of supply for the gas sector in the four countries by ending derogations in isolated markets (FI, EE, LV, LT)², and
- to achieve cost reduction for the consumers (industry, commerce and household sectors) by reducing market barriers for gas supply companies
- to induce investments in gas infrastructure in the respective region; any larger investment in the East-Baltic will require a regulatory system for the gas sector, especially any investment in a LNG terminal.

The **specific objective** of this study is

- to identify if, and how an Entry/Exit model for the East-Baltic gas market could be defined and implemented in the region, and
- to support the European Commission and the LNG Task Force / High Level Group with recommendations on actions and policy measures towards an Action Plan for the East-Baltic gas sector.

0.2 Strategy and outline of the approach

With regard to the methodology of identifying and defining a regulatory system for the East-Baltic gas market we will follow the experience learned in **Western European countries** like Great Britain, Germany, Belgium, and the Netherlands. Here we can build on specific experience gained in

¹ The project has to be carried out in the context of the 20/20/20 objectives of the EU and the electricity and gas market de-regulation, and the integration of the three Baltic states energy markets into wider EU by developing interconnections and strengthening internal networks to support market integration.

² For example by agreeing on a regional LNG terminal for the East-Baltic states or by strengthening the role of Poland as an “energy bridge”.

launching and operating an Entry/Exit model for the gas sector in these countries.

The **general objectives** for the East-Baltic gas market can be summarized as follows:

- Security of supply
- Diversification of routes of supply and sources of supply
- Open, competitive market and TPA Third Party Access
- Better utilization of gas infrastructure
- Environmental aspects
- Reduction in costs and tariffs
- Increased sales of gas.

The **vision is one (single) open gas market in the East-Baltic area**, which is integrated into the EU gas market. Based on experience in European regions, with the introduction of two new pipelines and the introduction of a new LNG-Terminal the gas market in the East-Baltic, which is a “monopoly” market, can be transferred to an open market with access for additional new suppliers. With an increasing number of suppliers, additional large scale users (power plants, industry) will occur and increase the entire market volume for gas use in all sectors of the economy at a comparatively lower price level.

1 General description of an Entry/Exit Model in the gas sector

A basic **Entry/Exit model** for a certain region is structured and defined by the following elements keeping the experience from EU countries like Germany, the Netherlands, and United Kingdom. The UK has had developed a new and novel way of regulating natural monopolies such as gas transmission and gas distribution pipeline systems. The UK system consists of 6,000 km of gas transmission line and around 250,000 km of gas distribution lines and is the second largest in the world after Gazprom of Russia. In order to build this economic model it is necessary to include forecast capital and operating costs. This information is supplied by the company being regulated but needs to be checked by an independent engineering consultant. In general, all European EEM models are structured as follows:

- **Definition** of Entry/Exit Model - natural gas enters the grid at any entry point and leaves the grid at any exit point, even at different times during a defined time interval (usually one day) at prices independent of distance of transport.
- **Entry points** within a market area are for example border points, gas storages or LNG terminals.

- **Exit points** are industrial companies, power plants, gas storages, border points or regional gas distribution networks.
- **Contracts:** contracts, online booking procedure, manual procedure, prioritisation of orders, sale of balance service agreements, trading, register of players, are usually defined during implementation of the EEM model.
- **Nominations** in m3/h have to be made for an entry point or for an exit point, during nomination no balancing is needed (again: nominations can be made at different entry points with different m3/h at different hours of the day, the same applies for nominations at exit points – to be balanced during the “gas-day”). Nominations include basic nominations, re-nominations, entry and transmission nominations, exit zone nomination, storage nomination, gas transfer facility nomination, transfer point nomination, matching procedures on entry-, transmission-, storage- and transfer-points, matching at the transfer point.
- **Allocation:** entry allocation, transmission allocation, exit zone allocation, storage allocation, transfer point allocation, to be defined during implementation of the EEM model.
- **Commodity and capacity charges:** with their “commodity charges³” and “capacity charges⁴” at the entry point and on the exit point, to be defined during implementation of the EEM model.
- **Balancing zone** is a defined area that can be regional⁵, national⁶ but also supra-national area (national border points must not be necessarily entry/exit points).
- **Emergency supply:** This will be ensured by all TSOs in the respective regions, being responsible for the gas network operations.
- Transport capacities have to be **booked** (nominated) **in advance** for both entry or exit points (usually nominations in m3/h are made only for an entry point or for an exit point, during nomination no balancing is needed).
- At the **virtual point** customers can buy and sell additional gas to react on unexpected changes in supply or demand.
- Period for balancing, “**gas-day**” (usually 06.00 a.m. to 06.00 a.m. CET)
- **Balancing and settlement** - A process of reconciling the total gas provided to the system on behalf of a customer (or a group of customers) to the amount of gas used by that customer during a given time period. Settlement will be completed when the cost of the imbalance between scheduled delivery and aggregated customer usage is assessed.

³ Measured for example in “cent/kWh” independent from the distance of transport.

⁴ Measured for example in “cent/peak-day-kWh per day” for all entry points and all exit points based on a matrix of long-term marginal transport costs.

⁵ For example, this is the case for Germany.

⁶ For example, this is the case for The Netherlands and for UK.

- **Invoicing, fees, and terms of payment:** This is organized by the balancing company providing the market participants with the respective information, to be defined during implementation of the EEM model.
- **Market definition and conditions includes** OTC (over-the-counter) market, which is a contract outside the normal trading procedure with a direct contract between two market participants, and a “on-the day-commodity market”, which allows balancing during a gas day, then the secondary market of entry and exit capacities, which is practically congestion management, and in addition gas futures for usually 12 to 36 months period delivery and a spot market with gas traded for short term deliveries.
- **Organization and shareholders:** Usually the regional TSOs are shareholders of the balancing company, and the regional TSOs provide their know-how for an efficient operation of the market.
- **TSO level co-operation:** On TSO level co-operation agreements with regard to ITC – Inter TSO Compensation, entry points, exit points⁷ as well on virtual trading point and on congestion management⁸ have to be established.
- **Regulator co-operation:** Co-operation between the national regulatory bodies and national ministries responsible for the gas sector are required, national laws and regulations have to be adopted, according to principles set out in an intergovernmental agreement and ENTSO-G competence in the gas regulation, Article 8, and CAM, Balancing NC will have to be followed.
- **Standard software** can be used as an upgrade to existing software; for secondary market we refer for example to some specific software like “trac-x”.

The general **rules** for implementation of the EEM model are mainly defined in the CAM NC (Capacity Allocation Mechanism and Balancing Network Code), rules for contract structure (contracts, online booking procedure, manual procedure, prioritisation of orders, sale of balance service agreements, trading, register of players), rules for nominations (basic nominations, re-nominations, entry and transmission nominations, exit zone nomination, storage nomination, matching procedures on entry-, transmission-, storage- and transfer-points) and rules for allocation (entry allocation, transmission allocation, exit zone allocation, storage allocation, transfer point allocation). Additional **rules** detail the balancing and balancing zones, emergency supply, invoicing/fees/terms of payment, capacity calculation, cost allocation and transition of existing contracts.

All of these elements have to be defined and considered during the introduction of the EEM model to the East-Baltic region.

⁷ We refer to Gas Regulation 715/2009 Article 18(4) and to Annex 3. Here we refer also to Commission Decision 685/2010.

⁸ We refer to Gas Regulation 715/2009, Annex 1.

2 Overview on barriers to investments in gas infrastructure and to implementation of an Entry/Exit model in the East-Baltic gas sector

This chapter includes an overview on current state of art of the gas sector in the East-Baltic region itself and the regulatory regime in the gas sector with respect to **barriers for an introduction of an Entry/Exit Model** to the region.

This **analysis will serve as a basis for the recommendation** on the regulatory systems and the input to an Action Plan in the respective countries.

2.1 Legal barriers

We do not see any major legal barriers on the introduction of the EEM model to the East-Baltic gas market on European level; on **European level** all regulations and directives are valid and cover all European countries, therefore no specific legal action on that level is needed.

On the other side, there is a strict need for **common national regulatory systems** with the respective laws and regulations on national level with free TPA access to all new gas infrastructure investments (LNG terminal, pipelines, and UGS⁹). In order to ease the implementation process after introduction of the EEM model the text of the respective national laws and regulations should be on the widest range in a common wording and terminology covering the entire “Balancing Zone”. The current national regulation of the respective gas markets will have to be adapted to the needs of a single regional open gas market.

And we know that the national **TSOs have long-term contracts**¹⁰ with the Russian suppliers and that the contracts have to be fulfilled from both sides. This will limit the possibilities of the TSOs to cope with a new regulatory system in the gas sector. Those contracts have to be fulfilled by both sides (“**pacta sunt servanda**”) or have to be re-negotiated. As from European experience these long-term contracts were changed to medium and short-term contracts ensuring mutual benefit for both sides: buyers and sellers can try to get more favourable prices on the short-term market.

⁹ Underground gas storage

¹⁰ The gas contracts for Lithuania and for Estonia end in 2015, while Finland and Latvia are bound until 2025 and 2030. And, Gazprom has a long-term contract on 2/3 of the capacity of Incukalns UGS in order to serve the St. Petersburg region in winter peak periods. Even the Polish TSO has a long-term contract with Gazprom until 2020.

In case, modifications of long-term contracts can not be agreed by the two parties involved, this will lead to continuous disturbances in the daily EEM procedure as daily prices are either higher or lower compared to the long-term gas prices. If daily prices are higher then the long-term prices, sellers will try use the EEM market to get additional revenues, in case that daily prices are lower then the long-term prices negotiated, this will cause losses for the buyers as long as they have “**take-or-pay-contracts**”.

2.2 Organisational barriers

All stakeholders in the gas sector, i.e. the TSOs, the Ministries and the regulatory authorities have been continuously involved in the planning process for the **EEM model introduction**. All of them have agreed on an informal level that the introduction of the EEM model is of priority and that they will support this introduction process.

The ownership of the East-Baltic TSOs is somehow similar, as **Gazprom and E.ON are shareholders of all national TSOs**. Therefore their willingness to attract additional competitors to the region will be limited to a certain extent as they could loose their “monopolistic market situation”. On the other hand, the TSOs have to comply with EU regulatory system. Therefore we do not see the TSOs as forerunner of this process, but experience from Western Europe shows that the TSOs adapted comparatively fast with the new legal situation:

- **Gazprom** will loose its monopolistic status for the gas sector in the East Baltic region, we assume, that they will accept this, as they have to comply with EU regulations and national laws, but will try to be involved in other activities in the region, for example as partner in the new LNG terminal, the UGS storage or the new pipelines. The advantage for the national economies would be to have a well experienced partner with its own financial resources. But, in order to initiate competition in the East-Baltic gas market, the role for Gazprom as partner in additional new gas resources (LNG) should be limited.
- **E.ON as a vertically integrated gas company** in all East-Baltic Member States, but compared to Gazprom not being a supplier of gas to the region, will not actively support the introduction of the EEM model to the region. On the other hand, as all TSOs, E.ON will have to comply with the national regulations and then be more active in the region in order to limit their losses in the regional gas market shares. Therefore we expect that E.ON will consider an ownership in new gas pipeline infrastructure but not in the additional LNG terminal¹¹, as there are special companies investing in LNG terminal as their core business. We expect that E.ON will consider

¹¹ The investor for the LNG terminal should be a “new” player in the East-Baltic gas market in order to establish a competitive market situation.

being a **supplier of LNG** to the new terminal company. In parallel to EEM introduction the unbundling process will continue, as we do not know the outcome of this unbundling process¹². Then, E.ON will have to apply to the new legislation and – probably – somehow withdraw from its current market activities and could concentrate on the TSO level. But of course this will be decided by E.ON Ruhrgas International headquarter at Essen.

- For the upcoming period until the introduction of the EEM model we see a role for **new investors** entering the East-Baltic gas market, especially with the construction of the new LNG terminal. This will be beneficial to the East-Baltic economy as competition increases.
- After introduction of the EEM model, as experience show in Western Europe, new companies will enter to this market, especially on the trading floor. We expect this starting on a moderate level allowing a one-year-period, where **traders** will observe the market opportunities. If the number of gas traders will not be satisfactory for increasing competition, “gas release” will have to be considered for certain entry points.

	Estonia	Finland	Latvia	Lithuania	(Poland)
Transport System Operator - TSO Gas	AS EG Vorguteenus	Gasum Oy	JSC Latvijas Gaze	Lietuvos Dujos	Gaz-System
owned by	AS Eesti Gaas				
vertically integrated	yes	no	Yes	yes	no
Shareholders (1.1.2008)					
E.ON Ruhrgas International	34,0%	20,0%	47,2%	38,9%	
OAQ Gazprom	36,0%	25,0%	34,0%	37,1%	
State of Finland		24,0%			
Fortum Heat and Gas	18,0%	31,0%			
Itera Latvia	10,0%		16,0%		
State Property Fund				17,7%	
The State Treasury					100,0%
Others	2,0%		2,8%	6,3%	
SUM	100,0%	100,0%	100,0%	100,0%	100,0%

Table 1: Structure of shareholders of the regional TSOs in the East-Baltic gas sector

- Another barrier will be the upcoming topic of “**unbundling**” between supply, transmission and distribution of gas. As the East-Baltic TSOs are often directly linked with regional gas distribution

¹² As E.ON is involved as shareholder in all four East-Baltic TSOs, we do not expect a identical unbundling legislation in all countries, for example if Lithuania follows the foreseen “ownership unbundling” this will have different results to a legal unbundling, which could be in place in some other East-Baltic countries.

companies, with the changes in the regulatory system also the process of unbundling will start, which could weaken the position of the current monopolistic situation. Following discussion with regional operators we do not expect unbundling activities in the near future; of course with the introduction of EEM model to the region, which means ending of the derogation period, the process of unbundling between supply, transmission, and distribution will be in parallel to the introduction of EEM model.

From organisational side on political level we do not see any larger barriers limiting the introduction of the EEM model to the Baltic area, from our point of view the current TSOs will not lead this introduction, this will have to be **lead by the respective national Ministries** and its regulatory bodies.



Figure 1: Current gas network within the East-Baltic region

2.3 Regional barriers

Of course there is regional competition between the East-Baltic Member States, when the decision will be made on the location for the LNG terminals. All four countries of the East Baltic area have shown their strong interest in offering the location for the LNG terminal, but it is clear that **only one LNG terminal** is feasible in the region according to limited annual gas consumption¹³. The expectations from all countries are always in two

¹³ Total regional gas consumption in the East-Baltic area including Finland is about 10.3 BCM/a while a conventional “small” LNG terminal has a capacity of about 4 to 6 BCM/a.

directions, ensuring national security of supply and benefitting from the positive economic impacts of an LNG terminal:

- Of course, **national security of supply** is best served with an LNG terminal on the territory of the country, but as stated before, there is a maximum of one terminal that could serve the East Baltic gas market.
- And the investment needed will support **regional growth** and local working places for the operation and will generate additional revenues from LNG gas sales. Therefore the regional interest by all countries is similar.

Besides this, we have observed a certain “**dynamics**”, which means that decision makers on each national level are under somehow “strict” observations from their national side expecting each country getting the LNG terminal to its home country. This leads to a certain blockade on any decision process, as no country gets the LNG terminal agreed by the other countries. Internal “pressure” on decision makers on the location of the LNG terminal is quite high and will be **carefully followed not only by energy sector experts but also by the press, the parliament, and the public**. In our opinion, there will be no acceptance to a new LNG terminal without a somehow balancing benefit for the countries, which do not have the location of the LNG terminal.

Therefore competition between the countries on the location can be balanced by forming a certain **balanced regional package**¹⁴, which balances the interest of all countries, especially those countries, which have no LNG terminal on their national territory. Of course, the introduction of the EEM model is independent to the operation of a regional LNG terminal, as derogation ends with any other measure offering additional new source of gas, for example the Amber PolLit pipeline, but with the new LNG terminal we will have a new source of gas and therefore derogation ends and the EEM model has to be introduced to the region.

2.4 Economic barriers

If the regulatory system will not be well defined in a comparatively short time period, this will **cause uncertainty on the pay-back of investments** and therefore the private investments will be delayed or cancelled. But private investment is absolutely necessary for the implementation of any infrastructure projects (LNG terminal, pipelines, UGS) as there will be only

¹⁴ A **regional package** for the East Baltic gas sector taking into consideration the technical and economic maturity of projects **could** be defined as **for example**: Lithuania with co-financed gas pipeline to Poland (Amber PolLit), Latvia with extension of the UGS and the “Baltic Gas Balancing Ltd.”, Finland with Estonian-Finland Balticconnector pipeline and Estonia with operation of the new LNG terminal.

a co-financing from European institutions¹⁵. And we have to understand, that gas consumption in the three Baltic States has decreased between 1991 and 2009 from about 9 BCM/a to about 6.0 BCM/a¹⁶. The **fixed cost** stay with the gas system, but with a decreasing number of consumers and less gas consumption the gas price will increase. This increase will lead to further substitution of gas¹⁷ to oil, electricity, and renewables and weaken the relative position of gas in the national and regional energy mix. Pending on the size and the age of a gas infrastructure system in Europe, about 40% of the gas price paid by the consumer is on fixed cost. As to the definition of fixed cost, a decrease from 9 to 5 BCM/a will have – ceteris paribus – an increase in gas prices of 32%¹⁸ compared 1991, just distributing the fixed cost to a smaller amount of consumption.

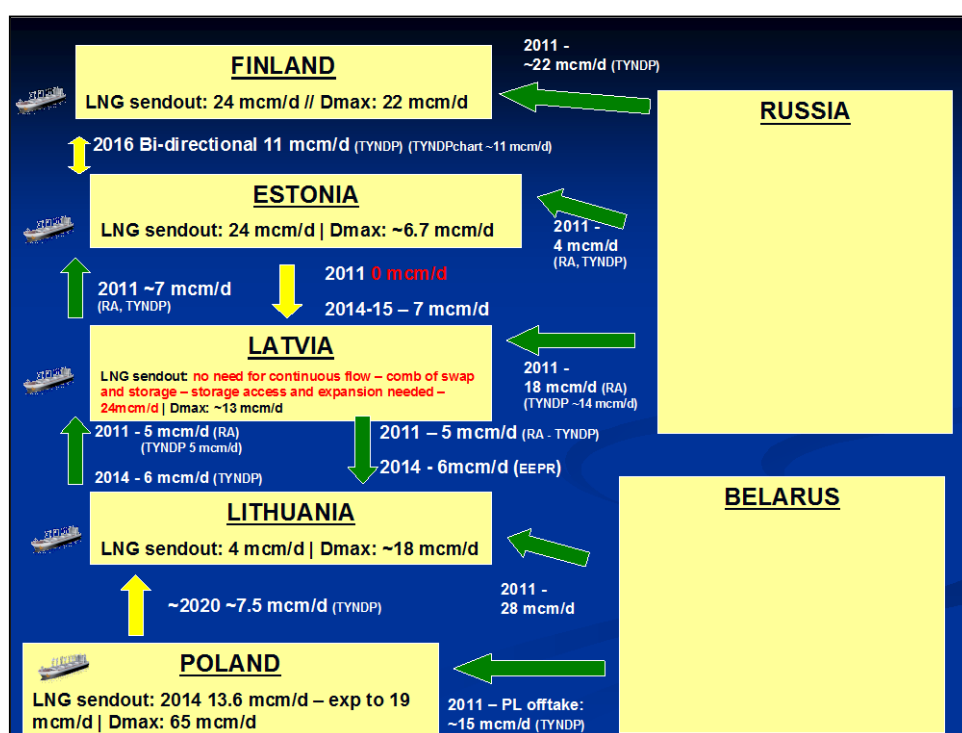


Figure 2: Current flows in the East-Baltic gas systems¹⁹ (maximum daily flows in mcm/d)

¹⁵ e.g. European Commission, European Energy Programme for Recovery, European Bank for Reconstruction and Development, European Investment Bank

¹⁶ European Commission, Directorate-General for Energy and Transport (DG TREN): EU Energy in Figures 2010, Brussels 2010

¹⁷ This is especially true for the large scale industrial consumers, for example for the fertilizer company ACHEMA in Lithuania.

¹⁸ $0.4 \cdot 9 + 0.6 \cdot 9 = 9$ then $9/9 = 1.0$; $0.4 \cdot 9 + 0.6 \cdot 7 = 7.8$ then $9/7.8 = 1.15$

¹⁹ Source: LNG Expert Group, Brussels, March 2011, please note the assumptions on this graph (a) in the case of LNG, the maximum daily send-out capacity (as informed by project promoters) is indicated. This capacity may be fully used only in optimal conditions and cannot be maintained for an extensive period of time. (b) "Dmax" figures indicate the total daily gas demand during a day of exceptionally high gas demand occurring with a

2.5 Technical and other barriers

Regional **annual gas consumption** had been decreasing during the last two decades in the East-Baltic region from about 9 BCM/a in 1991 to about 6.0 BCM/a in 2009. As the size of the gas network had been defined during former Soviet Union period, we face some high capacities in the gas system. Those unused capacities can be used for the increase in gas transactions following the introduction of the EEM model, which requires a larger level of gas transmission.

With reference to the gas network and the current and planned extension of the interregional pipeline system, and depending on the location of the LNG terminal, we do not expect any technical barriers against introduction of EEM model, which requests an increase in gas trading, but **limited increase in physical flows** as gas flows are independent of physical entries and exits of gas in the pipeline network within the balancing zone.

<h2>3 SWOT analysis and its effects on investments in gas infrastructure</h2>

In this chapter we review and assess **strengths, weaknesses, opportunities, and threats** of an introduction of an Entry/Exit model for the gas sector in the East-Baltic region using experience gained on European level and in its Member Countries and which are advanced in Entry/Exit models or similar approaches (UK, Germany, Netherlands and other countries). We concentrate on those countries that can be regarded “exemplary” for the East-Baltic countries and Finland/Poland.

3.1 The European view

From the European viewpoint we understand the **parallel introduction of the LNG terminal and the new pipelines** in combination with the EEM model as a unique possibility to increase competition in this regional gas market and to reduce the cost for gas. This has been highlighted during the Council Meeting on the 4th of February 2011, where it is clearly stated that “No EU Member State should remain isolated from the European gas and electricity networks after 2015 or see its energy security jeopardized by lack of the appropriate connections.”²⁰ This has been discussed during

statistical probability of once in 12 years, this definition is already included in the 994/2010 Regulation concerning security of gas supply.

²⁰ General Secretariat of the Council: European Council 4 February 2011, Conclusions, Brussels, EUCO 2/1/11, REV 1, CO EUR 2, CONCL 1, 8 March 2011, page 2

the last 20 years in extension; therefore market participants are waiting for new technical solutions compared to current dependence on Russia's gas.

3.2 The regional view from the East-Baltic Member States

The EEM model introduction will be a unique chance for East-Baltic gas companies to **enter** in a fast and efficient way into gas markets of the other neighbouring countries as they do not have to negotiate a transmission contract in the neighbouring country, they **just nominate entry and exit gas data** independent from the country, just inside the balancing zone.

And, market **dependency on Russia's gas** will decrease so that in general all market participants²¹ will consider gas use as an attractive alternative with low emissions at competitive energy costs.

A threat in this transition period could be an increase in **costs for the operation of the EEM model**. But having in mind the gas market in the East-Baltic region with about 10.3 BCM/a in 2009, which comes to consumer cost of about 2.7 billion Euro, the costs for the operation for the EEM model with the Baltic Gas Balancing Ltd. will be during investment phase limited to 2 Mio Euro, which is about 0.1% of the total annual costs for gas consumption. After introduction phase we do not see any larger cost for the operation coming up, so that the negative effect of changing the current regulatory system is limited and can be easily overcome within a short period of operation of the new system.

3.3 Regional view from neighbouring countries Finland and Poland

The size of Poland and Finland compared to the East-Baltic States is not only exceeding these countries in population and land but also for **gas consumption** figures.

Considering this, we would expect new opportunities for Polish and Finish gas companies in **entering into new markets** then facing new competition in their home countries.

²¹ Current market participants are the TSOs, the regional gas distribution companies and large scale industrial consumers. With the introduction of the EEM model the number of market participants will definitely increase while European gas companies and gas dealers enter the East-Baltic gas market.

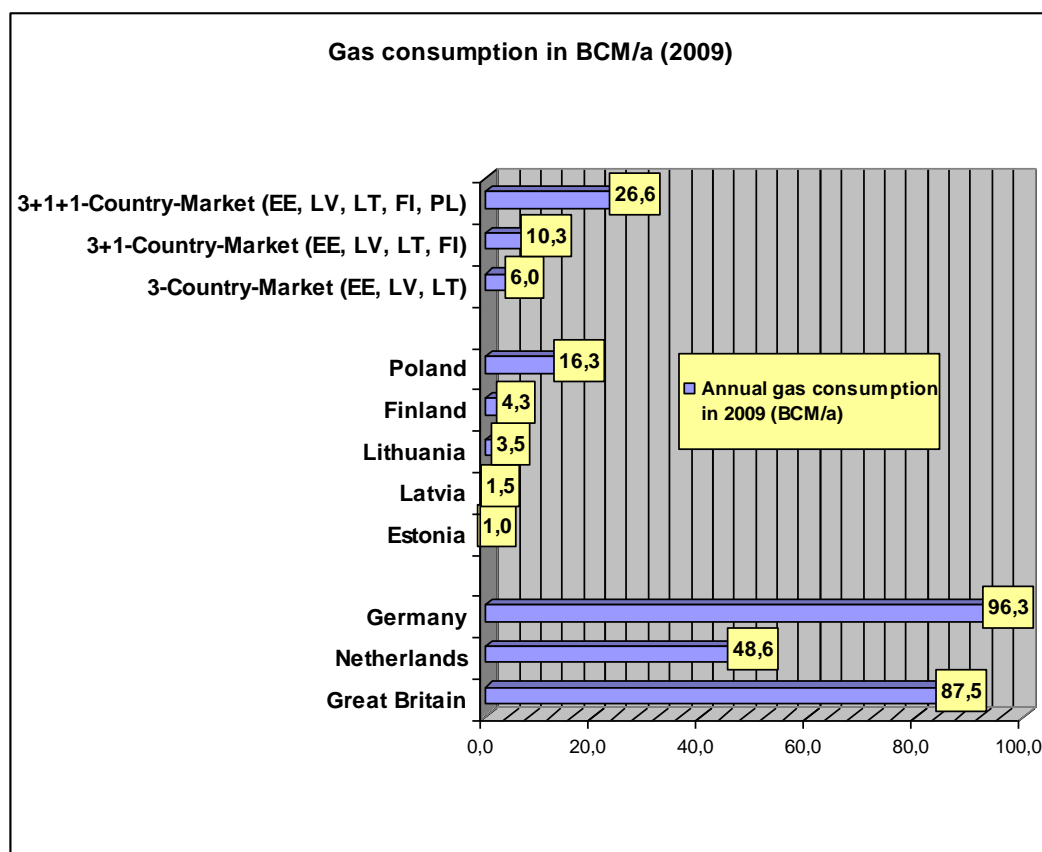


Figure 3: Comparison of gas consumption in different EU countries in 2009²² and its influence on the definition of the size of planned balancing zone in the East-Baltic area

The strength of the Polish TSO could be its **experience** in running an EEM model in its region, so they are better aware of any upcoming topics during start up phase of the EEM model. In case that the AmberPolLit pipeline will be completed and having the experience from the European markets, we expect at least ten new Polish gas companies and gas dealers entering the East-Baltic gas market during the first two years of operation.

3.4 The view from industrial, household, and other consumers of gas

Large scale industrial consumers see the introduction of the EEM model as an ideal tool to increase competition²³ between the gas suppliers. Here

²² Source: Central Intelligence Agency: The World Factbook, Natural gas – consumption, country consumption to the World, Washington 2011.

²³ The increase in competition is improving after three years of EEM operation, in Germany in 2008 there were 39 gas areas (Netzgebiete) with more than 11 different suppliers, while this figure increase to 264 gas areas in 2009 with more than 11 different gas suppliers low (Bundesnetzagentur: Jahresbericht 2010, Berlin 2011).

we expect, as from European experience that up to 40 % of all industrial consumers will change their current gas supplier within two years of EEM operation. Competition usually decreases the cost for gas²⁴, or during a price increase in the energy market, it limits the increase of prices. Therefore consumers and especially large scale consumers understand the EEM introduction as a positive opportunity. For the moment we do not see any negative effects from the introduction of the EEM model to the region from viewpoint of gas consumers.

3.5 TSO's operator view

The viewpoint of the regional TSOs is **not homogenous**. For those TSOs, which are very competitive and innovative, the introduction of EEM model is a unique chance to get into new markets at short notice and with limited costs. Therefore these TSOs understand the EEM in a positive way, all TSOs are – in general terms – in an equal situation and there is no forecasting, which of the TSOs will better benefit on this restructuring process²⁵.

Any TSO being limited to past periods as **natural monopoly** will loose their relative position and the number of customers will decrease. Experience from Germany and other European countries show, that in the first years only 10% to 15% of the households will finally change their gas distributor, but on the industrial level with larger consumers this rate is up to 40% within 2 years following the introduction of EEM. And this will be both, new opportunities for some TSOs and threats for others pending on the management capacity to cope with the new market situation.

3.6 Overall comparison of strengths, weaknesses, opportunities, and threats

For the **overall evaluation** of any strengths, weaknesses, opportunities, and threats, which are linked to market introduction of technical measures (LNG terminal, new gas pipelines and gas storage capacities) and the introduction of the EEM model.

²⁴ This was especially true right after the introduction period of the EEM model in Germany for the industry sector, about 5 years after introduction of the EEM model the price difference for household gas prices between standard suppliers and newly suppliers as in 2010 was only 5.92 c/kWh compared to 5.94 c/kWh, which is comparatively low (Bundesnetzagentur: Jahresbericht 2010, Berlin 2011).

²⁵ As experience in Europe has shown there no indicators for the success in this restructuring process, it mainly depends on the decision of the management of the TSOs, how to adapt to the new market situation.

Strengths of the EEM model introduction to the East-Baltic:

- Avoiding “**Pancaking**” (the addition of multiple transmission charges to the cost of gas as it passes through many control areas)
- **Opening of the gas market** to new companies with the EEM model, which eases the introduction of new gas companies and gas dealers to the East-Baltic area independent from the Third Party Access, which will be in parallel to the EEM introduction
- Increased **transparency** in the gas market (prices have to be published)
- **Private investments** in additional supply of gas (storage, LNG-Terminal) due to avoiding a monopsony market (only one single buyer)
- **Very limited costs** for the operation of the “Responsible for a comprehensive market area”
- **Harmonized** to EU regulatory schemes.

Weaknesses of the EEM model introduction to the East-Baltic:

- **Technical functioning** during implementation phase (measuring, accounting, balancing, invoicing)
- Only **limited interest** of current TSOs in ending the derogation period (which means that their monopolistic position could end).

Opportunities of the EEM model for the gas market, new competitors, for the population and economy and users of the current system:

- **New gas companies** can more easily enter the market and increase competition
- **Reduction in gas prices** for industry and consumers
- **Ending the potential threat of continuously increasing gas prices** due to monopolistic market and substitution of energy sources
- There could be a possibility to **re-negotiate** long-term gas contracts with Gazprom having an alternative sources available, if requested.

Threats of the EEM model for the gas market, gas utilities, for the population and economy and users of the current system:

- **Instability** of the gas network (lack of operating reserve)
- Ending of the **monopolistic** market situation for current gas utilities
- Increase in need for **operating reserve** due to volatility of markets.

The positive effects of this new system will **compensate** negative effects which are linked to the transition period between the two regulatory schemes. And, we expect - based on Western European experience - that the number of technical and organisational failures including software problems in the balancing regime of the EEM model will decrease within a few days and weeks and will be at acceptable level after first month of

operation. Other effects on the East-Baltic gas market are independent²⁶ to the introduction of the EEM model approach to this region.

4	Proposal for an Entry/Exit model for the East-Baltic gas sector in relation to current EU and national energy and gas market policies
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The introduction of the Entry/Exit model to the East-Baltic region will be based on both, the **BEMIP objectives** and the **Commission objectives** for the regulation of energy markets²⁷. The proposal for a new regulatory framework will have to build on the current situation in each of East-Baltic country. Therefore any recommendations with regard the East-Baltic gas system will have to consider the specific current situation and the national laws and regulations, but also follow the principle of compatibility with the European regulations. **Alternatives to the EEM model** are a

- **“Path-Dependent Point-to-Point Model”** (not for further use, using long-term marginal cost), or
- **“Postage Stamp Tariff”** (distance or non-distance dependent), or
- **“Nodal Gas Pricing Model”** (very limited discussion, more of theoretical interest as this model is based on long-term marginal costs calculations)

but these models are not compatible to the current EU regulations and directives.

4.1 Current framework of EU regulations

The advantages of the **“Entry/Exit model”** compared to a former widely used **“path-dependent point-to-point model”** have been extensively discussed during the last years and there is experience in introducing and operating EEM models.

Any larger gas transmission system **within the European Union has to be based on an Entry/Exit model**. Natural gas enters the grid at any entry point and leaves the grid at any exit point. These entry points and these exit points are administrative or virtual collecting points. Natural gas

²⁶ LNG for shipping could be a new opportunity as an addendum from the introduction of new gas sources to the Baltic region, selling LNG to Belarus to limit their dependency on Russian gas, selling LNG from the Baltic LNG terminal to Poland and Europe and finally a number of energy efficiency measures depend on the availability of gas, for example gas-fired heating pumps or gas-fired cogeneration and tri-generation. The only threat could be an increase in infrastructure costs and following this a possible increase in subsidies for the investments.

²⁷ And the new regulatory regime will have to be built on the experience gained in Europe, which is available through the European Regulators Group for Electricity and Gas (EREG).

that enters this grid can come from a production site, import or from gas storage. Natural gas that leaves the pipeline system at an exit point enters a local or regional transmission grid, an industrial site, a power plant, or an export point. At entry and exit points any transport capacity must have been contracted in advance.

The two **main regulations and directives** in relation with introduction of EEM model in the East-Baltic gas sector are:

- Directive **2009/73/EC** of the European Parliament and of the Council of 13th July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC Text with EEA relevance Official Journal L 211, 14/08/2009 page 94 – 136 and
- Regulation (EC) No **715/2009** of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005, especially Article 13 on Tariffs for Access to Networks.

According to **Article 13**, Regulation 715/2009 it is defined that the tariffs for network users shall be non-discriminatory and set separately for every entry point into or exit point out of the transmission system. Cost-allocation mechanisms and rate setting methodology regarding entry points and exit points shall be approved by the national regulatory authorities. By 3rd September 2011, the Member States shall ensure that, after a transitional period, network charges shall not be calculated on the basis of contract paths. Besides this Regulation 715/2009 includes the following Articles with reference to EEM model introduction, namely

- Article 2 Definitions
- Article 4f ENTSO-G
- Article 6f NC Network Code
- Article 13 Tariffs
- Article 14f TPA TSO SSO LNG
- Article 16 Congestion management
- Article 21 Balancing rules
- Article 22 Trading
- Article 30 Derogations and exemptions.

4.2 Derogation from Regulation 715/2009 and its influence on the EEM model introduction

Directive 2009/73/EC, Art. 49, clearly states for emergent and isolated markets a derogation from this Directive under the **following conditions**:

- Member States **not directly connected** to the interconnected system of any other Member State and having only one main external supplier may derogate from Articles 4, 9, 37 and/or 38.

- A supply undertaking having a **market share of more than 75 %** shall be considered to be a main supplier. Any such derogation shall automatically expire where at least one of the conditions referred to in this subparagraph no longer applies.
- Articles 4, 9, 37 and/or 38 **shall not apply** to Estonia, Latvia and/or Finland until any of those Member States is directly connected to the interconnected system of any Member State other than Estonia, Latvia, Lithuania and Finland

Therefore it is clear that there will be no implementation of the EEM model to a country or region, which is **under current derogation**.

4.3 Scenarios on the future of the East-Baltic gas sector

Three basic scenarios have been developed to demonstrate the different implications based on general decisions on the regulatory system. The Status-Quo-Scenario gives details on the implications of a continuation of the current gas system with the understanding of continuous derogation.

Two other **scenarios** show implications following a national and a regional approach, for details on the differences between a 3-countries-approach, a 4-countries-approach, and a 4+1-country-approach we refer to Chapter 4.

There is one conclusion on EEM market introduction for the East-Baltic region, namely that **without any new interconnecting pipelines and without a new source for gas (LNG), there will be no EEM model implementation and the sales in the regional gas market will steadily decrease**, which will raise the gas prices as the fixed cost will be distributed between a constantly decreasing number of clients. Or in other words, with new interconnecting pipelines and the LNG terminal, **competition** in the East-Baltic region will increase significantly, which will lead to high economic attractiveness for natural gas combined with an increase of customers and gas sales using the EEM model approach.

Overview on East Baltic Gas Sector Scenarios			
Scenario	Status quo	National approach	Common East Baltic regional approach 3 or 4 or 4+1
LNG Terminal	no	no	yes
Balticconnector	no	yes	yes
PL-LT Interconnector	no	yes, with this pipeline the derogation period ends at least at national level	
Incukalna gas storage	mainly for the use in Latvia and in Russian Federation during winter peak periods		extended use as seasonal storage for the entire East Baltic area
EEM model introduction	not needed, derogation will further exist	yes, in 2014	yes, with "Big Bang" in 2015
Effects on competition and prices of wholesale market	prices remain compared to European level quite high	expected decrease on wholesale market prices at about 10%	expected decrease on wholesale market prices at about 15%
Use of biogas in the gas system	no use for biogas	limited input from biogas producers	biogas will be produced at high level and most of this biogas will be injected to the gas grid
TPA in practice	in general possible	possible, but limited interest	comparatively easy after an introduction period of 1-2 years
SWOT opportunities	-	stepwise procedure reduces risk of failure	"Big Bang" would request only one change of gas contracts
SWOT threats	-	very limited increase in competition, even in mid-term periods	failure during market introduction due to size of the market and including cross-border problems
Future of the East-Baltic gas markets	no future for natural gas as a steadily decreasing market will have to cover the constant fixed cost of gas system operation	no significant change to current situation, limited use of natural gas in the national markets	increase in sales of about 10% in the medium term besides success in energy savings and energy efficiency

Table 2: Scenarios for the future of the East-Baltic gas system

4.4 Cost allocation scheme for investments in infrastructure in the East-Baltic gas market and organisation of the market using the Entry-Exit Model

There are plans for a set of investments in gas infrastructure for the East-Baltic area. These plans include new gas pipelines (Balticconnector, Amber PolLit), an upgrade of existing pipelines (EE-LV and LT-LV), extension of Incukalna UGS (LV), the new LNG terminal (EE²⁸) and the

²⁸ Only with an LNG terminal in Estonia we can use in high season winter periods the current gas pipeline system as an additional reserve, as with an location for the LNG terminal south of Estonia the current gas network is used for conventional provision of gas to the northern part of the East-Baltic area, therefore with a southern LNG terminal solution no additional reserve capacities for the northern part can be achieved.

Baltic Gas Balancing company. For this **investment package** expected cost and their influence on future gas prices in the East-Baltic²⁹ area has to be calculated.

Within this **calculation scheme** the cost for the investment package is allocated to equity financing and to third party financing, followed by a division to foreseen shareholders. Then the sources for financing (EBRD/EIB, private banks and EU) are given. Based on economic calculations with lifetime, interest rates, and annuity factors the influence on total capital costs and in comparison to current gas tariffs the increase in capital cost is calculated, which will have to be added on the current gas prices in the East-Baltic. And, finally the cost increase of capital cost has to be seen in relation to a decrease in operational cost, mainly decreasing import gas prices or at least limitations for any gas price increase.

The **main assumptions** in this calculation scheme on cost allocation cover the following topics:

- **ownership** between the East-Baltic TSOs on the new LNG terminal and on the new gas pipelines, here we assume an equal base between the East-Baltic TSOs
- **company shares** on the “Baltic Gas Balancing Ltd.” for EEM balancing purposes, where we assume equal shares between the East-Baltic TSOs and the Polish TSO
- **cost calculation** of the planned investment
- **equity financing** of the total investment cost with 20% equity
- economic **lifetime**, which is also the pay-back period with 15 years
- **interest rate** for equity financing and loans with currently 6% p.a. interest rate as a mix between public and private financing conditions
- **co-financing** of infrastructure³⁰ from European institutions for an increase in “security of supply”
- **bank financing** from EBRD/EIB and private banks, for the large investments we assume 40% of investment cost from public sector financing and 10% from private bank sector
- **gas price calculation** on East-Baltic area level based on current household and industry gas tariffs in 2010
- medium term **CAPEX/OPEX relation** is assumed within a base scenario with 1 to 4

²⁹ Different calculations can be made using an Excel-based “Cost Allocation Scheme for Large Scale Investments in Gas Infrastructure in the East-Baltic Region” in order to allow sensitivity analyses pending on changes in input parameters.

³⁰ Here we refer to the criteria for eligibility of project financing as listed in the respective upcoming infrastructure programmes, like the TEN-E or Structural Funds.

allow additional storage for gas coming from the LNG terminal during low price summer periods and use of gas during peak time prices in winter. And, with the physical availability of an alternative source to the East-Baltic gas market this will have a limiting effect on any gas price increase for Russian import gas. Finally there is still the **risk of higher LNG prices**³⁵ compared to long-term contracted pipeline gas from Russia this has to be accepted by the East-Baltic countries and consumers as a price component for additional security of supply and diversification of resources.

Based on this calculation scheme and based on the assumptions given, the two compensating effects on the gas prices, namely increasing capital cost through the planned investments (CAPEX) and the respective decreasing cost for the operation of the network (OPEX) using lower import prices could be **calculated**. And, with this allocation scheme the pay-back period for the additional cost of new infrastructure technical measures compared to a price decrease for import gas (both LNG and Russian pipeline gas) have been calculated compared to a status-quo-scenario. The main outcomes from this calculation are:

- The total investment cost for the investment package with the six measures as defined before are at **979.0 Mio Euro**.
- For financing these investment cost, it was calculated on a 20/80 base between equity financing³⁶ and other financing (private banks, European institution funds³⁷, specific loans by the European Development Banks or European Investment Bank) totalling to **781.6 Mio Euro**. It is assumed that the majority of investment cost is financed by the banking system (80%) and that the strategic pipelines and the LNG terminal, which have an influence on the entire Baltic regional market decreasing the import dependencies are co-funded by the European institutions with, for example, about 10% or totalling for five infrastructure measures at **89.7 Mio Euro**, which definitely will depend on further calculations and negotiations between the partners involved.
- The basic calculation is done on average economic lifespan of the investment of **15 years** and an **average interest rate of 6%**. Based on these assumptions the annuity for the investment has been calculated, which comes to **100.8 Mio Euro**.

³⁴ Total capacity of Incukalna UGS is about 2.3 BCM, but most of the storage capacity is already contracted to Russia (St. Petersburg region) for winter peak periods.

³⁵ For example due to increased demand on LNG due to increased economic growth in the US or increased demand due to additional use of LNG in the Japanese power sector following Fukushima accident.

³⁶ The contribution of the shareholders in equity financing of the investment package will be for the TSOs involved between 29.4 Mio Euro and 53.9 Mio Euro pending on the regional involvement. This equity financing totals to 197.4 Mio Euro.

³⁷ Any EU contribution to the investment costs for new gas infrastructure has to be limited to measures supporting the security of supply in the entire East Baltic region.

- Compared to current gas prices³⁸ of the various consumer groups (households 1,380/2,760 m³/a as well industry 10,550/1,050,000 m³/a) we come to an **average regional price increase of 3.0 % for households and 4.0 % for industry**. If this investment package is divided by the population in the region the **investment cost are at 79.59 Euro / capita**. The average price increase due to the investment cost is **0.0098 Euro/m³**.

Besides the basic scenario calculations we have completed a number of **sensitivity analyses**, especially with changes in the **interest rate** (4%) and changes in total investment cost (20% **price increase**). Sensitivity analyses have shown that the influence of a different “**lifespan**” and “**interest rate**” is limited. Finally the sensitivity analyses do not show a considerable change in the consumer gas prices compared to the basic scenario.

Considering a **short lifespan** with only 10 years the additional cost will be at 0.0129 Euro/m³, **extending the economic lifespan** to 20 years will come to an additional price of 0.0083 Euro/m³. Even a **reduction of the interest rate** for the project to 4% by keeping the lifespan of 15 years will lead to an increased gas price of 0.0085 Euro/m³.

5 The influence of the variation of the geographical area (3/4/5 countries) covered on the recommendations for an introduction of the EEM model to the East-Baltic gas sector

In this chapter we start with a closer look at the implementation within the **three East-Baltic Member States** Lithuania, Latvia, and Estonia, as they are direct geographical neighbours and have nearly no direct borders to other EU Member States³⁹. In a second step we discuss the proposed regulatory regime for these countries (annual gas consumption of about 6.0 BCM/a in 2009) adding Finland, and at a later stage adding Poland to the area covered. **Finland** (about 4.3 BCM/a in 2009) and **Poland** (about 16.3 BCM/a in 2009) have direct borders to other EU Member States and both countries are larger due to size of area, population, and gas consumption.

Please note, that without any additional source for gas, which is not coming from the current single supplier, i.e. Russian Federation, no EEM model approach will be recommended. In this case we recommend to

³⁸ Current average gas prices in East Baltic region differ from country to country and according to consumer groups. Considering average cost for 2009 and 2010 and average for all countries involved we have an average gas price of 0.32355 Euro /m³ for households and 0.24694 Euro/m³ in the industry sector.

³⁹ Except for a limited minor area between Lithuania and Poland.

keeping the current regulation system, of course with some important steps in the unbundling process, but no EEM model introduction.

5.1 The three East-Baltic Member States

Of course, defining a **single gas market** for the three Baltic States seems to be the most “natural” size of the market as this a common geographical area. And all countries depend currently on a single supplier from the Russian Federation, therefore we have some arguments for a common 3-country-gas-market.

But, the gas market in the three Baltic States is with an annual gas consumption of 6.0 BCM/a comparatively small and limited. For example, annual gas consumption in Great Britain is about 88 BCM/a in 2009, in the Netherlands it is about 49 BCM/a in 2009 and both countries have only one single gas market⁴⁰.

Therefore a common solution for this size of a market with about 6.0 BCM/a in 2009 is of lowest priority, we recommend either to stay with the current national markets or agree on a larger market with 4 or 5 countries. Even if Finland and Poland are added to this market, the annual consumption will raise to 10.3 BCM/a, or 26.6 BCM/a, which is by far smaller than the British or the Netherlands market.

5.2 The three East-Baltic Member States and Finland

In case all **stakeholders** in the East-Baltic area can agree on a LNG terminal, on an extension of Incukalna UGS and on at least one pipeline between Finland and Estonia (Balticconnector), this seems to be the minimum size for a competitive gas market, which is about 10.3 BCM/a.

And we have confidence that the four countries will **manage** to have one common regulatory scheme for the gas market. Discussion on an ending of the single-supplier situation in the four countries is on the way since beginning of the 90ies and discussion on a common EEM model implementation has started in 2010, therefore we see the **manageability** of a 4-country-solution as a strong argument to limit to 4 countries.

As to the discussion within the LNG Taskforce this solution seems to be the most promising solution, both feasible and with a moderate size of gas

⁴⁰ Of course, at the beginning of introduction of EEM models, the size of balancing areas were much smaller, for example Germany has had 17 balancing areas, which is in average a size of less than 6 BCM/a each, but tendency is clearly to large scale balancing areas, therefore only two balancing areas will remain in 2013 for Germany.

consumption allowing a **certain level of competition**, which is worth for the cost of implementing the EEM model into the region.

But we also have to understand that the European markets tend to decrease the number of balancing zones, for example **Germany** will have from 2013 onwards only two balancing zones, while the gas consumption in Germany totals at about 96 BCM/a in 2009⁴¹ with currently three balancing zones, **which is in average about 3 times the size** of the proposed four-country-market in the East-Baltic with expected 10.3 BCM/a. Therefore in the medium term a common gas market including the East-Baltic Member States, Finland, and Poland seems to be an appropriate size of a market ensuring a reasonable level of competition.

Besides the market size and the manageability regional viewpoints have to be considered:

- The **Baltic States** see the **advantage** of including Finland to this single market as the Balticconnector will increase their security of supply with an additional pipeline from the North.
- **Finland** seems to be **hesitating** in this process, as they have already agreed with Russia on a gas supply contract ending in 2025, and their national energy strategy is headed on renewables and on nuclear, therefore on national level there seems to be limited interest on extension of natural gas.

5.3 The three East-Baltic Member States, Finland and Poland

Finally we are confident that the **single European gas market** will create a larger common gas market in the North-East of Europe and this will include the Baltic countries, Finland, and Poland with a current gas consumption of 26.6 BCM/a in 2009.

This size of a common regulatory gas market (5-country-market) depends on expected **long term negotiations** between the four countries (FI, EE, LV, LT) being dependent on one single source (Russian Federation) and the five-country solution, where one country has a competitive access to the European gas markets.

Poland would be only interested in the East-Baltic gas market, if the AmberPolLit pipeline is completed. This will offer to Polish gas companies and gas dealers a wider field for additional sales in gas. And Poland would have access to the East-Baltic LNG terminal, supplying the country not only from the West (LNG terminal Swinoujscie) but also offering gas via the Eastern LNG terminal in the Baltics. But there is a very limited interest of the Polish side to construct the AmberPolLit pipeline, as near to the pipeline there are no large scale consumers, and we are somehow

⁴¹ Arbeitsgemeinschaft Energiebilanzen e.V.: Jahresdaten, Berlin 25.1.2011.

confident, that this pipeline will not be financed by the Polish side as there only a very few consumers. In case that there is co-financing from EU, the Polish side will reconsider the situation, but will not act on its own with any gas pipeline serving North-East Poland. We finally understand the situation as of very **limited interest** for the Polish side; therefore any negative impact of this 5-country-solution for the introduction of EEM is a possible threat to a short-term introduction of the EEM model to the East-Baltic region. We recommend not including Poland at this stage of EEM introduction to the East-Baltic balancing zone.

Main activities of Gaz-System in Poland are currently directed to connections to the South (Czech Republic) and to the West (LNG terminal). In the **long-run**, we see the Polish gas network also directed to the North with the new Amber PolLit pipeline.

5.4 Summary on the regional level

Following the discussion on the different size of the gas market, we come to the conclusion of a proposal of a two step system, starting with implementation within a limited geographical area of **four countries (FI, EE, LV, LT) in the beginning of January 2015** and extending this system to cover in addition Poland at a later stage of introducing the single North-East-European gas market, probably after 2020.

6 Identification of main actions and timelines for the establishment of an EEM model for the East-Baltic gas market

Within this chapter we define the elements for an Action Plan for the implementation of recommended measures with reference to the Entry/Exit Model system. This planned Action Plan has to be compatible to the other BEMIP initiatives and includes timelines and responsible actors on national and international level for its implementation.

6.1 Political and strategic actions on intergovernmental level preparing the implementation of the EEM model in the East-Baltic region

A common agreement on intergovernmental level as part of the High Level Group (BEMIP HLG) is a prerequisite for any progress in the implementation of the EEM model to the regional gas market. The discussion on the placement of the site for the LNG terminal (either FI, or EE, or LV, or LT) seems to be a “never-ending-story” as those countries, which have proposed LNG terminals for their own country, and will hardly

agree on a LNG terminal in a neighbouring country. Therefore only a **package, which includes the two pipelines, the extension of the UGS, and one LNG terminal** will have the chance for national support in all countries involved. In case, the intergovernmental agreement will not be concluded, the introduction of the EEM model will fail or is being postponed to a certain period later.

The principles set out and defined in an intergovernmental agreement will **give a guideline** to the adaption of national laws and regulations and assisting the gas sector in establishing the EEM model within the region. As a conclusion of the investigations in the East-Baltic gas market and based on the experience in Western Europe with the operation of EEM models the following **recommendations to the BEMIP HLG Group** from viewpoint of an implementation of the Entry/Exit Model to the East-Baltic gas market are given **“10 Principles on EEM implementation to the East-Baltic gas market”**. We recommend having an agreement on these principles in 2011 between all Members of the HLG group; implementation of the agreed principles will be in the period up to 2015:

- Agreement on a common and single **balancing zone** of four countries (FI, EE, LV, LT), if the Balticconnector is operational, otherwise only three countries (EE, LV, LT)
- Responsibility for **technical purposes** remains with the current TSOs in the four countries (no single East-Baltic TSO operator)
- Agreement on a **common regulatory system** for the East-Baltic gas market (regulators remain on national level)
- Foundation of **“Baltic Gas Balancing Ltd.”** in 2013 with equal shareholders (respective gas TSOs) from all five countries (FI, EE, LV, LT, PL) with (20% shares each) situated in Riga
- **Country based capacity allocation** (no joint East-Baltic capacity allocation for the entire market area)
- Starting **EEM** operation on a stand-by-level in January 2014
- **Big Bang introduction** of the EEM system in January 2015 (no country-by-country implementation) with the completion of the LNG terminal and/or the Amber PolLit pipeline
- Parallel activity of **unbundling** to be completed in timeline with the operation of the EEM model, at latest in January 2015
- **National contact points**: We propose to identify and appoint national contact points for the co-ordination of implementation of the EEM model in the East-Baltic region, which could be - depending on the respective national decision made - part of the national regulatory authorities. The nomination of a contact point as responsible for implementing the EEM model to the respective country would ease and fasten the communication and decision process.
- **Signing of an agreement on intergovernmental level**: We propose Member States concerned defining and signing an “Inter-

Governmental Agreement” within the BEMIP HLG on the introduction of an EEM model. The principles set out and defined in an inter-governmental agreement will give a guideline to the parallel adaptation of national laws and regulations and assisting the gas sector in the opening of the East-Baltic gas market.

These **recommendations** will require internal discussion within the BEMIP HLG Group and decision on next steps of implementation of the EEM model into the region based on these principles.

6.2 Legislative and regulatory actions for the implementation of the EEM model in the East-Baltic region

Following the discussion on investments in a new LNG terminal in the East-Baltic area, there is an increased need for a common, stable, and long-term regulation of the gas sector in this region in order to **stimulate** any private large-scale investments in the gas sector by setting clear rules in the operation of the gas market in the East-Baltic area.

The network cost will be **reimbursed** to the network operator by the entry and exit prices⁴²; all four national regulatory authorities should keep their independence on the regulation of the national markets but for the gas market a common approach based on an inter-governmental agreement using the High Level Group between the countries would be needed. This would include:

- Investment in LNG terminal by private sector (non-TSO) on TPA basis **without a regulated scheme** in Estonia (indirect inclusion of the LNG terminal cost to the cost of gas sold to the market, but direct subsidies to the investor, if required)
- Regional coverage of the **"Balancing Zone"** of EEM implementation: We propose to have a market area covering all four countries, i.e. Estonia, Finland, Latvia, Lithuania.
- Adapting the “Framework Guidelines on **Gas Balancing in Transmission Systems**”⁴³ developed by the Agency for the Cooperation of Energy Regulators (ACER) to the East-Baltic area
- Adapting the “Framework Guidelines on **Capacity Allocation Mechanisms** for the European Gas Transmission Network”⁴⁴

⁴² The new tariffs could consist of (1) commodity charges (measured for example in “cent/kWh” independent from the distance of transport) and of (2) capacity charges (measured for example in “cent/peak-day-kWh per day” for all entry points and all exit points).

⁴³ Agency for the Cooperation of Energy Regulators (ACER): Framework Guidelines on Gas Balancing in Transmission Systems, Draft for Consultation, Ljubljana, April 2011

⁴⁴ Agency for the Cooperation of Energy Regulators (ACER): Framework Guidelines on Capacity Allocation Mechanisms for the European Gas Transmission Network, Draft for Consultation, Ljubljana, March 2011

developed by the Agency for the Cooperation of Energy Regulators (ACER) to the East-Baltic area

- The costs for the planned two pipelines (FI-EE and LV-PL) should be defined as **Regulated Asset Base**⁴⁵ (RAB) in order to increase the likelihood of investments.
- **Derogation** and exemption from open gas market ending: With the implementation of new infrastructure projects (LNG terminal and/or pipeline to Poland) in the East-Baltic region, the necessity to derogate from the implementation of an open market will end according to Regulation (EC) 715/2009, preface (19). According to Directive 2009/73/EC, Article 49 the gas market will have to allow Third-Party-Access independent from implementing or using the EEM model.
- We propose an early decision on the details of the EEM model in 2011 as new infrastructure projects in the region require an early implementation of the EEM model both from legal side and from investor's side to **ensure recuperation of costs**.
- Legal and regulatory actions to be taken for the implementation of the EEM model will have to be identified and defined: We propose a full list of **common legal and regulatory measures** that will be required for any implementation of the EEM model in the respective country and finally implemented in a regional EEM market.

6.3 Actions from the countries TSOs on implementing the EEM model to the East-Baltic region

TSO's in the gas sector from the East-Baltic area will agree on a **common company** being responsible for the EEM handling in the region. We recommend founding a common "Baltic Gas Balancing Ltd." with equal shares for all five national TSO's. The paid-in-capital for this new company can be limited as the responsibility for the security of the gas networks will remain with the current national TSO's. The Entry/Exit-Model (EEM) will be an integral part of the **investment package** for the East-Baltic gas market.

- One **common operator** for balancing purposes for the entire East-Baltic gas market (Estonia, Finland, Latvia, Lithuania) to named as "Baltic Gas Balancing Ltd.". This company should have equal shareholders⁴⁶ (20% each) from all TSOs in the East-Baltic region

⁴⁵ Regulation (EU) No 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC, Brussels 2010

⁴⁶ We do not recommend defining the shares between the different partner TSOs on the basis of national annual gas consumption in the countries, as consumption differs from year to year and as Lithuania has one large scale industrial consumer anyhow acting differently to the current market with direct access to Gazprom, therefore equal shares keep all shareholders interested in the success of the balancing company.

including the Polish TSO. In the medium-term an extension of the balancing zone to 5 countries including Poland is expected, therefore the Polish participation in the East-Baltic balancing company is required. The headquarters should be in Riga (Latvia), in case that the LNG terminal⁴⁷ could be located in Estonia, and the two new pipelines link Estonia and Lithuania to their neighbouring EU Member States countries are constructed and extension of Incukalna UGS is on the way.

- **Organization and shareholders:** One company with TSOs as shareholders from all five Member States involved.
- The “**Balancing Zone**” covers the four countries. Entry Points in this case would be exclusively the border points of the import pipelines to the East-Baltic area (not the national border points between the East-Baltic States), the LNG terminal and the Incukalna UGS. Exit Points would be the large scale gas users (industry, power stations etc) and the gas distribution networks (of course all Entry Points are also Exit Points).
- **Additional entry/exit points:** The Entry/Exit model considers the current entry points (gas pipelines from Russia and the large scale gas storage of Incukalna) but also upcoming new entry points as new pipelines (Balticconnector, Amber), new LNG terminal in these Member States and planned new gas storage capacities in Latvia and Lithuania as well additional exit points like the Amber PolLit pipeline to Poland.
- **Emergency supply:** This will be ensured by both, the Baltic Gas Balancing Ltd. and by all TSOs in the respective regions, being responsible for the gas network operations.
- Period for balancing, “**gas-day**” (06.00 am to 06.00 am CET would mean 07.00 to 07.00 EET in the East-Baltic)
- **Invoicing, fees, and terms of payment:** This will be organized by the new Baltic Gas Balancing Ltd providing the market participants with the respective information, to be defined during implementation of the EEM model
- **Capacity allocation** on a country-by-country base
- The **Virtual Trading Point** would have to be defined; therefore only entry and exit fees will have to be paid by the users in the market, these fees will have to cover the cost for operation of the East-Baltic gas network. No transmission fees or distance fees would occur.
- Only the total gas demand and gas supply would have to be balanced by the clients within one **gas-day** (from 07.00 hours EET to 07.00 hours EET next day to be compatible to the European markets). Common entry and exit costs (entry fee, exit fee) on the Virtual Balancing Point for the companies will ensure an increasing

⁴⁷ There has been no decision made on the location of the new LNG terminal, discussion on political level is going on, but for practical reasons of project maturity, the Estonian LNG terminal infrastructure project has been technically and economically developed and investment in this terminal seems to be more mature.

competition in the East-Baltic gas market. Any registered trader in this system (gas trading companies but also large scale consumers itself) will receive the contracted gas independent from location and independent from any distance.

- **Timeframe** for implementation of the EEM model to the East-Baltic region: We propose a regional implementation in January 2015 (“Big Bang”) with - at latest - the completion of the new infrastructure projects (new pipelines, new LNG terminal). Here we do not recommend that the EEM model can be introduced on national level prior to the completion of planned infrastructure projects.
- **Total cost** for the introduction of the EEM model are about 2.0 Mio Euro⁴⁸ including a two year preparation and testing period (2013-2014) followed by operational cost of about 1.28 Mio Euro during operation from January 2015 onwards.
- Based on experience in Western Europe, during first time implementation of the new EEM a “**flexible**” procedure between the balancing service company and the respective market participants is recommended because of uncertainties and failures during the start-up phase.

6.4 Stepwise introduction versus Big-Bang introduction

Of course, a **stepwise introduction** of an EEM model on a country-by-country base will limit the risk of technical and economic failure during introduction period. Stepwise introduction means that in a first step the EEM model is established on national level in 2014 followed by integration on supra-national level in 2015. Therefore in 2015 the companies responsible for balancing would have gained experience on national level and the integration process could benefit from this experience.

On the other side, this stepwise introduction will be done with **limited efforts** as there will be only limited markets for gas and any competition is comparatively low or even does not exist. And **costs will occur four times** on each national level building up the infrastructure in the respective countries, which will be then re-used in only one of the four countries.

In a **two-steps** procedure all contracts and rules have to be changed twice, which could cause additional risks during both transferring periods.

⁴⁸ Based on costs occurred in other European regions, for example for the implementation of balancing service companies in the Netherlands and in Germany.

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No.	Activities	2011	2012	2013	2014	2015	Government	NRAs	TSOs	Others
Part 1: Activities on political and strategical level										
1.1	Reviewing and evaluating of current situation in the East-Baltic gas market	x					x			
1.2	Agreeing on the definition of the balancing zone in the four countries (EE, LV, LT, FI)	x					x			
1.3	Agreeing on the foundation of a single balancing service company with five shareholders (EE, LV, LT, FI, PL)	x					x			
1.4	Agreeing on the definition of balancing rules according to ACER guidelines	x	x	x			x			
1.5	Agreeing on the definition of CAM rules according to ACER guidelines	x	x				x			
1.6	Signing of an Memorandum of Understanding (MoU) on EEM introduction between the national Ministries on administrative level	x					x			
1.7	Supporting the establishment of gas traders in the balancing zone, especially for groups of city utility networks and for industrial branches and/or defining "gas release" to increase competition				x	x	x			x
1.8	Evaluating the EEM introduction process	x	x	x	x	x	x	x	x	
1.9	Other activities									
Part 2: Activities on legal and regulatory level										
2.1	Developing a common Memorandum of Understanding (MoU) between the National Regulatory Authorities (NRA) on the procedures of EEM implementation	x						x		
2.2	Adapting national gas market regulation procedures to EU requirements		x					x		
2.3	Developing a network code on gas balancing			x	x			x		
2.4	Supporting ending of the derogation phase			x	x			x		
2.5	Following the unbundling process (independant from EEM introduction)		x	x	x	x		x		
2.6	Surveying of gas market results by National Regulatory Authorities (NRAs)	x	x	x	x	x		x		
2.7	Developing of common guidelines for balancing rules			x	x			x		
2.8	Developing of common guidelines for nomination procedures			x	x			x		
2.9	Defining common procedures of setting transmission charges and imbalance charges			x	x			x		
2.10	Harmonising of new balancing regimes with latest EU level of gas market regulations	x	x	x	x	x		x		
2.11	Other activities									
Part 3: Activities on TSO level										
3.1	Preparing and signing a common Memorandum of Understanding (MoU) on the foundation of Baltic Gas Balancing Ltd. by all national TSOs (EE, LV, LT, FI, PL)	x							x	
3.2	Founding of Baltic Gas Balancing Ltd. including preparation of equity and funds			x					x	
3.3	Preparing and developing the test phase for Baltic Gas Balancing Ltd.				x				x	
3.4	Incorporating all adapted ERGEG/ACER rules to the EEM model in the East-Baltic area				x	x			x	
3.5	Deciding on IT systems and software development for EEM (licensing versus own development)		x							
3.6	Defining invoicing and payment procedures during gas-day operations				x				x	
3.7	Setting operational the Baltic Gas Balancing Ltd. (staffing, office, internet platform etc)				x	x			x	
3.8	Exchanging data on gas provision and gas consumption for all (potential) entry and exit points			x	x				x	
3.9	Defining premium capacity, free allocation capacity and restrictions in the pipeline system			x	x				x	
3.10	Simulating the gas network with historical data and with forecasted data after EEM implementation in 2015			x	x				x	
3.11	Calculating interconnectivity capacities after 2015 by defining different scenarios pending on changes in the regional gas market				x				x	
3.12	Developing a risk matrix for East-Baltic gas system after implementation of EEM model				x				x	
3.13	Establishing working relations with gas traders in the East-Baltic gas market			x	x				x	
3.14	Connecting all data loggers at all entry/exit points with the office of the Baltic Gas Balancing Ltd.				x				x	
3.15	Developing and implementing the software for the EEM balancing system			x	x	x			x	
3.16	Ensuring full operation of Baltic Gas Balancing Ltd.					x			x	
3.17	Other activities									

Table 4: Flow chart for the implementation of an EEM model to the East-Baltic region

Therefore we recommend a **Big-Bang** introduction. As to experience in Western Europe during the introduction phase the technical problems with the new as market operations can be limited. Therefore it is clear that a Big-Bang introduction⁴⁹ is the appropriate “speed” for introducing the EEM model.

6.5 Timeline and responsible institutions for the implementation of the EEM model to the East-Baltic area

We understand the urgency of the gas market integration on European level. From our experience in Western Europe a starting point for the implementation of the EEM model should be in **January 2015**. From today's perspective (June 2011) this allows enough time to define the regulatory framework and to found and set operational the “Baltic Gas Balancing Ltd”.

7 Summary

(1) The **implementation of an Entry/Exit Model** to the gas sector in the East-Baltic area **is accepted** by all market participants – recommendations differ only according to size of the market and which countries participate in the introduction of the EEM model and on the timeline, i.e. stepwise introduction or big-bang introduction.

(2) The introduction of the **EEM model is linked with the planned investments for the LNG terminal and the new pipelines** (FI-EE and LV-PL). In general, we understand the situation in the East-Baltic area with reference to investments in gas sector infrastructure that any large scale investment in the gas sector⁵⁰ like the planned LNG terminal is linked to both, technical improvements including extension of the pipeline system and the introduction of the Entry-Exit-Model to the entire East-Baltic gas market. Again: Without introduction of the EEM model there will be no investment in gas infrastructure, and, without large scale investments in gas infrastructure there is no need to move to the EEM model.

(3) The size of any planned conventional LNG terminal with about 4 to 6 BCM/a in the East-Baltic area is by far too large for any national gas

⁴⁹ From our observation of the current situation in the East-Baltic area, a strong support from the national authorities and support by the European Commission is needed to ensure the Big-Bang introduction in 2015.

⁵⁰ The following investments are considered: an LNG terminal, the two new pipelines to Finland and to Poland, as well the extension of the gas network from Latvia to the North and to the South, extension of Incukalna UGS plus the EEM model introduction with a total investment cost of about 979 Mio Euro.

market⁵¹, especially when current long-term gas contracts with Gazprom will have to be considered. Therefore the **LNG terminal must fit with its size into the regional East-Baltic gas market**. This requires investments in the pipeline system and an opening of the national gas markets to a common regional gas market in the East-Baltic covering all four Member States (FI, EE, LV, LT) as a single gas market area with an EEM model approach.

(4) We propose to implement the **EEM model in the beginning of January 2015** the EEM model in the region covering the **four countries (FI, EE, LV, LT)** even if the pipelines FI-EE and the pipeline LT-PL are still in the construction phase. We do not expect that all main technical measures will be completed at this time. Therefore the decision on the full operation of the EEM model will be with the completion of the LNG terminal in January 2015 as planned.

(5) The foundation of the Baltic Gas Balancing Ltd. will be completed and being operational in the beginning of January 2014 in order to allow a test period of one year. We recommend the **Big-Bang** introduction allowing no interim period in January 2015.

(6) In technical, economic, and political terms only a combined and parallel introduction of all defined technical and organisational measures⁵² will improve the situation in the East-Baltic gas market. All in all the technical and organisational modernisation of the East-Baltic gas market will **lead to a competitive market**⁵³ with

- costs decrease for both, households and industry tariffs,
- new opportunities for additional gas usage by additional marketing with lower gas prices for all consumer groups,
- lowered emissions compared to oil and coal use and finally
- diversification of energy resources by reducing the import dependency from one country.

(7) With this introduction of a **single regional gas market** a common EEM model with common rules of regulation will have to be defined. Of course, there is no legal need for an introduction of the EEM model at the current monopolistic situation⁵⁴ and there is no economic sense for the EEM model as long as national gas systems are not adequately linked and the

⁵¹ Estonia 1.0 BCM/a; Finland 4.3 BCM/a; Latvia 1.5 BCM/a and Lithuania with 3.5 BCM/a

⁵² Parallel introduction of all defined measures during the period 2012 to 2015.

⁵³ As to the experience in Western Europe with the introduction of the EEM models, after a one-year period of adjustment the competitive market situation could arrive after first year operation by the end of 2015 with new gas suppliers and gas dealers.

⁵⁴ Within the EU Directive 2009/73/EC it is clearly understood, that emergent and isolated markets, where gas systems of the Member States are not directly connected to the interconnected system of any other Member State and having only one main external supplier may derogate from Articles 4, 9, 37 and/or 38.

only source for gas imports is from one country⁵⁵, but all of these measures have been agreed and will be implemented in the next years until 2015. Therefore there is a strong need for preparation of next steps for the implementation of the EEM model to the East-Baltic region.

Abbreviations

ACER	Agency for the Cooperation of Energy Regulators
ANB	Ausspeise-Netzbetreiber
BCM/a	Billion cubic meter gas / year
BEMIP	Baltic Energy Market Interconnection Plan
BKN	Bilanzkreisnetzbetreiber
BKN	Bilanzkreisnetzbetreiber
BKV	Bilanzkreisverantwortlicher
BP	Balancing Point (Gashandelspunkt)
BSAP	Baltic Sea Action Plan
CAM NC	Capacity Allocation Mechanism and Balancing Network Code
CAPEX	Capital expenditure
CBA	Cost Benefit Analysis
CCGT	Combined Cycle Gas Turbine
CEER	Council of European Energy Regulators
DSO	Distribution System Operators
EC	European Community
ECA	Estonian Competition Authority
EEM	Entry/Exit Model
E-E-NB	Entry-Exit-Netzbetreiber
EEPR	European Energy Programme for Recovery
EEX	European Energy Exchange, Leipzig (www.eex.com)
E-KAMER	Office of Energy Regulation, The Netherlands
EMV	Energy Market Authority, Finland
ENB	Einspeisenetzbetreiber
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSO-G	European Network of Transmission System Operators for Gas
EP	European Parliament
ERGEG	European Regulators Group for Electricity and Gas

⁵⁵ Derogation from EU Directive 2009/73/EC ends with the opening of the gas markets ensuring a second source for gas with at least 25% market share.

EU	European Union
FSRV	Floating Storage Re-gasification Vessel
GIE	Gas Infrastructure Europe
GTF	Danish Gas Transfer Facility
HELCOM	Helsinki Commission, Baltic Marine Environment Protection Commission
HLG	High Level Group
ISO	Independent Systems Operator
LNG	Liquified Natural Gas
LV	Letztverbraucher
MCM/d	Million cubic meter gas / day
MGV	Marktgebietsverantwortlicher
NC	Network Code
NCC	National Control Commission for Prices and Energy, Lithuania (NCC)
NRA	National Regulatory Authorities
OCM	On-the-day-Commodity-Market
OFGEM	Office for Gas and Electricity Markets, United Kingdom
OPEX	Operational expenditure
OTC	Over-The-Counter Market
PUC	Public Utilities Commission, Latvia
REL	Regelenergielieferant
RLM	Letztverbraucher mit dem Zählverfahren registrierender Leistungsmessung
SLP	Letztverbraucher mit dem Zählverfahren Standardlastprofil
SSO	Speicherbetreiber
SWOT	Strengths, Weaknesses, Opportunities, Threats
TK	Transportkunde
TOTEX	Total expenditure
TPA	Third-Party Access
TSO	Transmission System Operator
UGS	Underground Gas Storage
VHP	Virtueller Handelspunkt
VP	Virtual Trading Point

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