

Client European Commission – Directorate General for Energy and Transport – Directorate C

Subject Updating T E N-Energy- Invest study (Contract n. TREN/04/ADM/S07.38533/ETU/B2-CESI) with a particular attention paid to the future development of the Energy Market in the Baltic region –
Working Group "Electricity market integration"
Assessment of the electric markets in the Baltic region

Order European Commission – DG Energy and Transport – Directorate C –
Contract number: TREN/C1/506/2008/SI2.514743, 20th Nov. 2008

Notes

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PUBBLICATO A9017215 (PAD - 1205744)

N. of pages 12 **N. of pages annexed**

Issue date June 2009

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Mod. RAPP v. 03

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REVISIONS HISTORY

Revision number	Date	Protocol	List of modifications and/or modified paragraphs
0	February 2009	A9004485	First issue
1	April 2009	A9014611	Change in the report title
2	June 2009	A9017215	Modifications in the summary of chapter 2 concerning the exploitation of eligibility right in the Lithuanian power market

1 FOREWORD

In the Baltic region the long-term underlying objective is to integrate the energy markets of all the Countries surrounding the Baltic Sea. The time horizon envisaged by the European Commission for such market integration is around the year 2015. In between, a progressive development of the power market in the three Baltic Member States shall be outlined: roadmap towards the final market design. For this purpose, the setting up of a working group on market issues has been decided at the High Level Group meeting held in Brussels on 20th November 2008. The main tasks of this working group include:

- ◆ **Assessment of the electricity market situation in the Baltic Sea Region;**
- ◆ **Definition of short- and medium-term milestones;**
- ◆ **Definition of actions/steps to be taken in order to reach the objective;**
- ◆ **Assignment of roles and responsibilities.**

In this framework, CESI has been engaged as technical advisor to support the European Commission and the members of the working group.

This report gives a general view of the present status of the electricity markets in the Baltic regions. The basic conditions for an effective electricity market are also recalled.

Note: this report presents the results so far obtained working in close collaboration with the E.C. and the WG Electricity Market Integration (EMI) members. Further activities shall be carried out to fully comply with the Terms of References of the WG EMI.

2 ELECTRIC MARKETS DESCRIPTION

Problem statement

- *identification of the current status of the electricity markets in the EU Member States surrounding the Baltic Sea, including also Norway, Russia (Kaliningrad region), Belarus and Ukraine (“extended Baltic region”);*
- *assessment of status and characteristics of existing markets in terms of volumes of the exchanges and levels of prices;*
- *evaluation of the compliance with EC directive 2003/54/EC;*
- *basic conditions for an effective electricity market.*

Methodology

- *Data collection from public available documents and elaboration;*
- *Specific information provided by the Market Operators, Transmission System Operators, Regulatory Authorities and representative of the Ministries of the Baltic Member States.*

Major results

Present status of the electricity markets:

- *The power prices of the NORDEL Countries (Norway, Sweden, Finland and Denmark) are quoted on the Nord Pool market that is in charge of the physical trade of electricity, the day-ahead market (Elspot) in the Nordic countries, the capacity allocation across KONTEK interconnector with Germany and the intra-day market (Elbas) in Finland, Sweden, Denmark and Germany;*
- *Germany is characterised by the presence of a well developed market, the European Energy Exchange AG (EEX) that has the strongest growth rates in terms of trading volume, sales revenue, yields of energy exchanges; moreover, it has the largest number of participants and the highest level of internationalisation in Continental Europe;*
- *Poland has its own market (PolPx) in which electricity is exchanged. Polish spot market is characterised by a rather low liquidity: the volume of energy trade was approx. 3-4% in 2008. The Polish market is characterised by a limited competition due to the concentration degree of the power industry (four main energy groups);*
- *The Baltic Member States present different structures and mechanisms of electricity markets as well as a different degree of market opening:*
 - *In Estonia electricity market is dominated by a single state owned vertically integrated company (Eesti Energia), which has 97% of the production capacity and an 88% of the retail market share and controls the whole transmission networks. In practice, according to the report on “Estonia – Internal Market Fact Sheet”, prepared by the E.C. in January 2007, “there is not functioning market as there are no independent suppliers”. Furthermore, according to the BALTSO Annual Report 2007, the market opening is about 16.5%; starting from January 2009 35% of the market will be opened; only by the year 2013 the opening of the electricity will be completed. Presently, there are 13 eligible customers, but no one of them uses the right of eligibility;*
 - *In Latvia the power market is completely open as from 1st July 2007 in compliance with the directive 2003/54/EC. There are no restrictions for any electricity trading company to enter the market and to offer electricity at a lower price. Electricity consumers can freely change their electricity supplier. There are also no restrictions or tariffs for electricity import and export. In May 2008 regulated tariffs for customers that do not have rights to receive universal service in accordance with the electricity directive were removed (53% of the customers). In the following six months a high activity of switching the supplier started (around 5% of Latvian customers).*
 - *In Lithuania since 1st July 2007 all consumers have got the status of eligibility (100% of market opening in compliance with the directive 2003/54/EC). Up to now around 13% of*

customers have exploited their right of eligibility. Regulated electricity price is lower than electricity price under market conditions.

- *Belarus and Kaliningrad region don't have any free electricity markets. In Ukraine the Wholesale Electricity Market Operator (SE Energorynok) was established in 1996 with the aim to raise competitiveness, financial stability and profitability of the industry. The market was created as a single buyer model. For cross-border transactions, a single entity has been appointed by the Ministry of Fuel and Energy: Ukrintergergo.*

Power pricing and volumes exchanged:

- *Looking at the statistical data of the EU Countries (that aren't market prices but give an idea of the prices without taxes paid by citizens), prices for householders in Lithuania, Latvia and Estonia are well below the average EU values;*
- *Wholesale prices of the three main markets of the Baltic region are quite different among them: in the year 2007 the average yearly price was about 38 €/MWh in the EEX market, 28 €/MWh in the Nord Pool. In 2007 in Poland the spot price were quite stable between 100 and 150 Zloty/MWh (average price 30.5 €/MWh), but this was not the case in 2008 and 2009 anymore. In 2008 prices increased quite sharply and were fluctuating between 150 and 250 Zloty/MWh.*
- *Volumes exchanged were in 2007: 124 TWh in the EEX, 290.8 TWh in the Nord Pool and 2.54 TWh in the PolPx. As it can be seen, the Polish electric market is characterised by a low liquidity, while Nord Pool shows the highest liquidity level.*

2.1 General overview

Scope of this paragraph is to give a general view of the markets characteristics in terms of level of pricing and volumes exchanged.

The Countries of “*extended Baltic Region*”¹ present different level of liberalization of the markets.

We can see that NORDEL Countries (Sweden, Finland, Norway and Denmark) are members of Nord Pool, a fully integrated and well-developed market.

Another well-developed market is the European Energy Exchange AG (EEX) in Germany. In Poland electricity exchanges are managed by PolPx.

Lithuania and Latvia have a full opening of the electricity market (all customers are eligible in compliance with the directive 2003/54/EC), whilst in Estonia the market opening is about 16.5%; starting from January 2009 35% of the market will be opened; only by the year 2013 in Estonia the opening of the electricity will be completed.

Belarus and Kaliningrad don't present a free market, while in Ukraine a Wholesale Electricity Market Operator (SE Energorynok) exists since 1996, which acts as a single buyer and supply energy to all the customers.

To give a general view of the level of electricity prices for households and for industrial users, data about electricity prices for the EU Countries in the year 2007 are reported in the figure below (source Eurostat [1]). The prices in the graphs include the energy prices and the network (transmission and/or distribution) fees, with possible further additional fees (e.g.: to provide incentive for RES, stranded costs, etc.).

¹ The “*extended Baltic region*” is composed by the EU Member States of Estonia, Latvia, Lithuania, Poland, Germany, Denmark, Sweden and Finland as well as the Russian Federation, with special concern to the Kaliningrad region, Belarus, Ukraine and Norway.

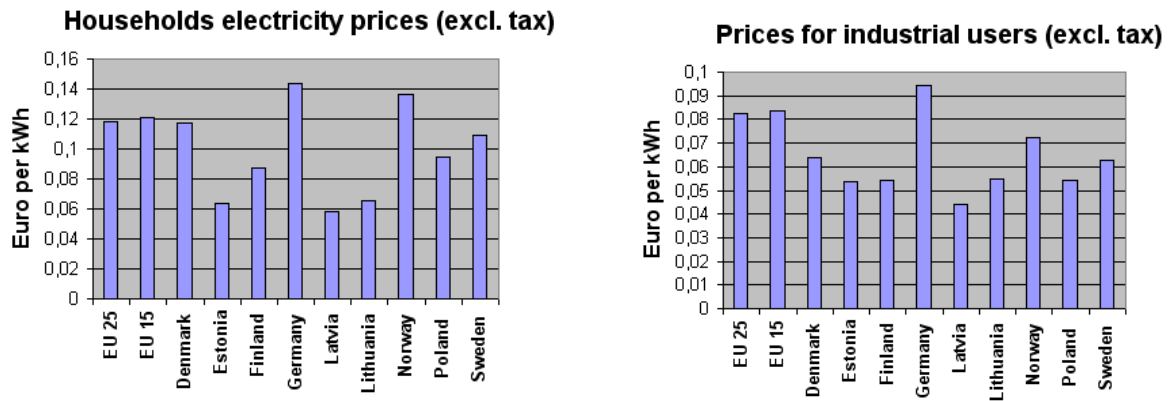


Figure 2-1 - Prices (without taxes applicable) for households electricity (based on a “standard consumer consuming 3.500 kWh per year corresponding to a standard dwelling of 90 m²) and for industrial users (annual consumption of 2000 MWh obtained by a maximum demand of 500 kW with an annual load power factor of 4000 hours)

As shown in the bar diagrams, Estonia, Latvia and Lithuania households’ prices of electricity are well below not only to the average EU values, but also to the price levels of the other EU Member States of the Baltic region. Prices for industrial users in Lithuania and Estonia (but not in Latvia) are almost equal to those of Finland and Poland.

Price values in 2007 for the three examined markets ([2],[3], [4], [5])) are reported in the bar diagram below. It can be seen that the average prices in the Nord Pool market were in 2007 below the other two markets except in the winter months (October, November and December). The average yearly price in the year 2007 was about 38 €/MWh in the EEX market, 28 €/MWh in the NordPool and 30.5 €/MWh in PolPx.

Volumes exchanged were in 2007: 124 TWh in the EEX, 290.8 TWh in the NORD Pool and 2,54 TWh in the PolPx.

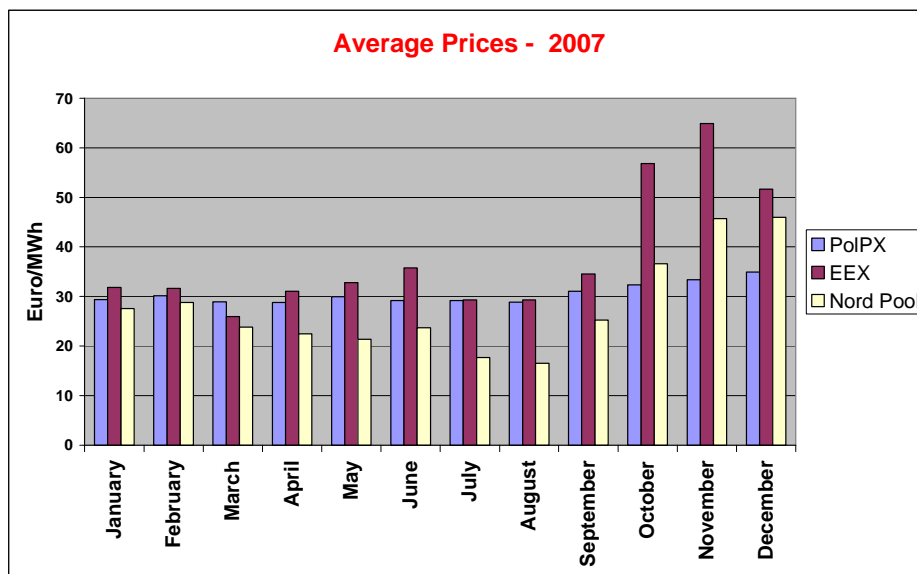


Figure 2-2 – Average prices in the three different markets considered (source [2],[3], [4], [5])

3 BASIC CONDITIONS FOR AN EFFECTIVE ELECTRICITY MARKET

To achieve the benefits of an effective market, trading between national utilities should be conducted in an open, competitive and transparent market. In general, a perfect electricity market allows maximizing the “*social welfare*”, which represents the difference between the price that the consumer is willing to pay to purchase energy and the price that the producers bid to sell energy.

The basic conditions for the creation of an effective European IEM are laid down in the EU Directive 2003/54 concerning “*common rules for the internal market in electricity*”. The basic conditions can be summarized as follows:

- *Free access to network for producers* to participate in the market. There should be no legal, administrative or discriminatory action for third party access to the distribution system operator (DSO) or the transmission system operator (TSO) networks, or for the connection licensing process
- *Free access to network for consumers* willing to participate in the market. This means no geographical barriers and no discriminations among applicants, who require to be connected to the grid.
- *Possibility for customers to change supplier* and make informed choices regarding who should supply them electricity, based upon the price and the quality² of the electricity.
- The possibility for producers to make informed choices on electricity generation should be based on *published information*. The information regarding tariffs should be easily available and transparent. The market rules should be well defined and information regarding system constraints and the market should be available to those who require it.
- The *market* should strive to be *liquid*. This means that it should have many participants and that no sole actor should be able to manipulate the price by their bids to the market. If one sole actor has that possibility, it can manipulate prices for his own interests. The term “liquid” implies a smooth price formation, which is not noticeably affected by a single bid. The regulator should have the possibility to restructure companies with a market share of the production assets that is too high, if such an actor takes advantage of its size to manipulate prices. To be liquid, the market must have a sufficient number of generators and consumers.
- *Electricity prices should be cost reflective of the actual costs to produce electricity*. This also refers to internalizing external costs although external costs are difficult to assess. These costs are usually handled with taxes or, in the cases of GHG emission, through trading with carbon credits.
- *The network tariffs must be cost-reflective*. This means that the TSO must act as a perfect monopoly, spreading its costs equally to users of its services. These costs must include long run costs meaning current and future investments and costs for the operation of the networks.

The role and responsibility of the various actors involved in the electricity market are described in the table below.

² Quality refers to the source of the electricity, fossil, nuclear or renewable. To enable this, access to easily comparable information is very important.

	Entitiv	Role	Responsibility
Actors	TSO	To transmit electricity	To balance the power system
	DSO	To distribute electricity	To convey electricity from transmission to end users
	Generator	To generate electricity	To deliver electricity according to bids or contracts. In some cases to respond to balancing bids
	Supplier	To supply electricity	To secure supply and demand of portfolio
	Trader	To offer electricity market services	To secure supply and demand of portfolio
	Broker	To match supply and demand bids of electricity market related products	None
	End User	To consume electricity	In some cases to respond to balancing bids
Facilitators	Power Exchange	To set market price, handle financial contracts	To facilitate a transparent and non discriminatory market place and, in some cases, handle congestion
	Regulator	To set market rules	Monitor the market actors and Power Exchange

Table 3.1. Functions of the entities on the electricity market

4 REFERENCES

- [1] Electricity prices by type of user. Eurostat database. <http://epp.eurostat.ec.europa.eu/>
- [2] GME. Gestore del Mercato Elettrico SpA. Rapporti e Statistiche. Borse Europee. <http://www.mercatoelettrico.org/It/Statistiche/ME/BorseEuropee.aspx>
- [3] PolPx, Towarowa Gięlda Energii, Polish Power Exchange, <http://www.polpx.pl>
- [4] EEX, European energy Exchanges, <http://www.eex.com/en/>
- [5] Nord Pool, <http://www.nordpoolspot.com/>, <http://www.nordpool.com/asa/>
- [6] BALTSO. “*Annual Report 2007*”. Riga. 2008
- [7] European Commission Energy. “ESTONIA – Internal Market Fact Sheet”. January 2007. http://ec.europa.eu/energy/energy_policy/doc/factsheets/market/market_ee_en.pdf
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- [9] European Commission Energy. “LITHUANIA – Internal Market Fact Sheet”. January 2007. http://ec.europa.eu/energy/energy_policy/doc/factsheets/market/market_lt_en.pdf
- [10] National Control Commission for Prices and Energy. Lithuania. Annual Report 2006

ANNEX 1. THE POLISH POWER MARKET

This annex presents more details on the Polish power market on the basis of the information received from the Polish Energy Regulatory Office (ERO).

Competitiveness and concentration degree

The current structure and the concentration degree of the power industry activity have a negative impact on competition conditions on Polish market. This structure resulted first from the horizontal and then from the vertical consolidation of state-owned power industry companies. Currently, there are four main energy groups.

The Polish Regulator assesses the competitiveness level through the calculation of the HHI³. The most recent estimated values are:

- for gross generating capacity = 1340,4
- for gross generation = 1717,1
- for wholesale trade in energy = 1920,2 (120,2 above the lower threshold of high degree of market concentration).

Pricing

Prices at PolPx were quite stable in 2007, which was not the case in 2008 and 2009 any more. Since 1st January 2008 suppliers are exempted by the President of the ERO from the obligation to submit tariffs for approval (with the exception of prices for households). At the moment only prices for individual final buyers are regulated. As a consequence, we can observe higher price volatility (as shown in the following two diagrams). Additionally, since 1st April 2008 long-term power purchase agreements are terminated. Still, the volume of energy trade on spot market is rather low, app. 3-4% in 2008 (In the first half of 2008 trade on PolPx accounted for 1,14 % of total energy generated in this period).

³ HHI: Herfindal-Hirschman Index. This index is calculated as follows: $HHI = \sum_{i=1}^N x_i^2$, where: N is the number of market players and x_i is the market share of the i -th player in percentage. Hence, the range of variation of HHI is between 0 (an atomistic market) and 10000 (monopoly). According to widely accepted guidelines the following classification is proposed:

- ♦ a HHI below 1000 is a highly competitive market,
- ♦ a HHI between 1000 and 1800 means that the market is moderately concentrated,
- ♦ a HHI above 1800 implies a high market concentration (oligopoly).

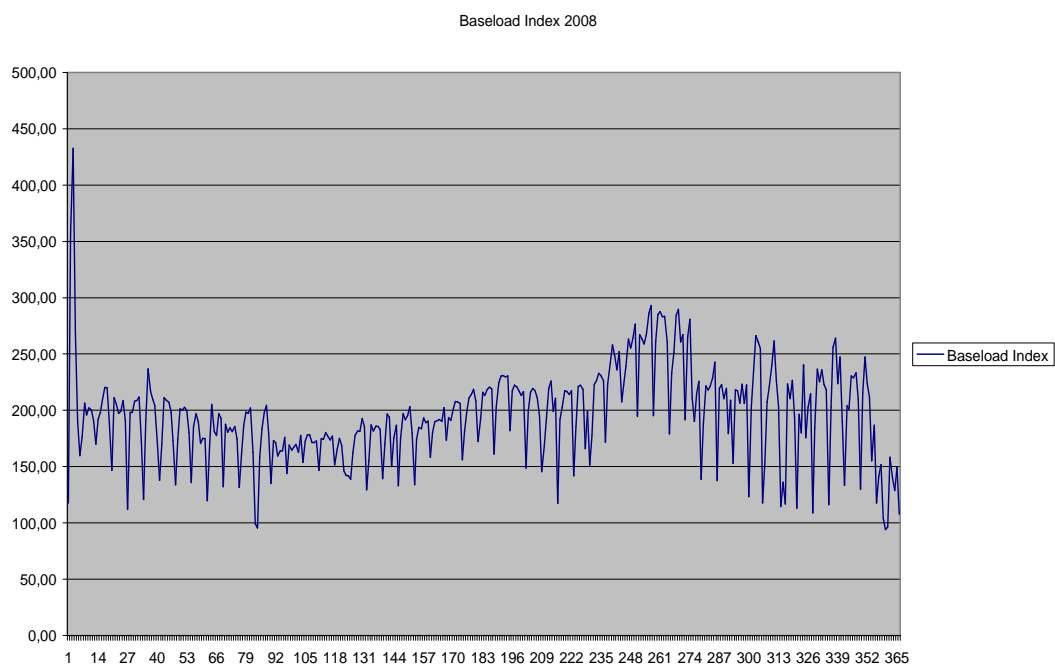
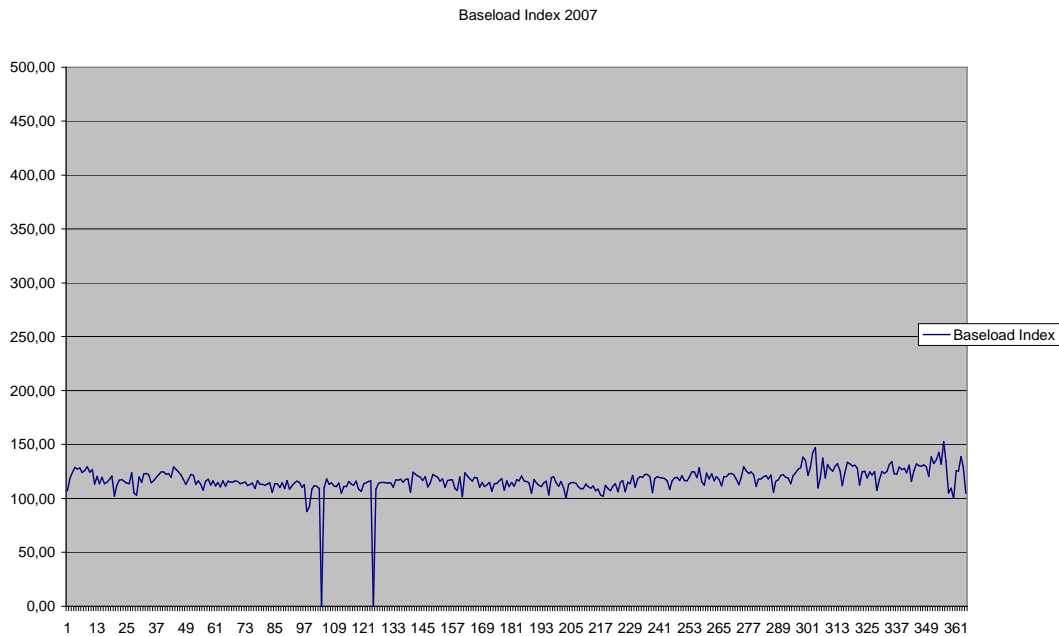


Fig. A.1 Base load prices in 2007 and 2008 in Poland (values in Zloty)

Bilateral contracts

In Poland electricity wholesale markets are subject to market surveillance by the ERO.

The ERO collects data on commercial contracts, both planned (yearly) and executed (half-yearly). The Regulator monitors such contract conditions as prices and volumes. Regarding duration, it is not monitored, however typical contracts are yearly ones. Recently, data were collected every 10 days, but currently, every month.

Bilateral contract prices show a spread with respect to the price level of the spot market, but this is obvious since power exchange is used to buy additional, lacking energy in (short) periods when demand is higher (securing the position). Moreover, volumes are lower than in bilateral contracts (the majority of energy, about 90%, is traded through bilateral contracts). It simply results in higher spot market prices.

Conditions to operate in the Polish market

To produce or trade energy in the Polish market an economic entity needs a license granted by the Polish Regulator. If energy is sold to household, the approval of tariff is mandatory.

There are special requirements for membership in PolPx, which are set in the internal Commodity Exchange Act.

There are no special requirements to set bilateral contracts between actors outside and inside Poland. Foreign trader needs its counterpart in Poland. Transmission capacities are allocated in coordinated auctions at the common border of CZ, DE, SK and PL.