DEVELOPMENT OF ELECTRICITY MARKET IN LITHUANIA AND IN THE BALTICS

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Abstract

Electricity market opening in Lithuania has started in the beginning of the year 2002 with the implementation of the Law on Electricity. The Law defined the electricity market structure and determined the gradual opening of the market.

From January 1, 2002 the former national electricity company Lietuvos Energija was split into several companies, including the transmission company, two distribution companies and several generation companies. New market players – the transmission system operator, the market operator, two public suppliers, and several independent suppliers – were granted licences and started their operation in a new market.

Latvia and Estonia are also liberalising their electricity markets in line with the EC Electricity Directive: in 2005 the Latvian Transmission System Operator was separated from the vertically integrated electricity generation, transmission and distribution monopoly Latvenergo and established as a legally independent company, and formally the full market opening for all commercial consumers was guaranteed. In Estonia electricity market opening is going slower as this country was granted a derogation of the Directive and full liberalisation is planned for 2013 only. Nevertheless, the vertically integrated electricity monopoly Eesti Energia was restructured and set as a concern with a separate transmission system operator.

Several studies have concluded that operation in a common Baltic market would be beneficial to all the three Baltic countries and establishing closed national electricity markets instead of the CBEM would cause a total welfare loss in all three countries.

1. INTRODUCTION

Lithuanian electricity sector has overcome major changes: in 2002 it was restructured and separate transmission, two distribution and several generation companies were established. At the same time the Law on electricity was passed, it set a totally new market structure and relations: the third party access was allowed to eligible consumers, competition was introduced in the generation and supply. With the further market opening and implementation of the second EC Electricity Directive all commercial customers were allowed to choose a supplier.

Liberalisation of the Latvian electricity sector was going slower and the national monopoly was only restructured but not split into independent companies. Nevertheless, the second EC Electricity Directive was also implemented in 2005 with full opening of the market for all commercial consumers.

Estonian electricity market was reorganised in line with the requirements to have legally independent generation, transmission and distribution companies - all they belong to the mother company, the former national monopoly Eesti Energia. But market opening is postponed due to protection of local fuel (oil shale) and full liberalisation is expected in 2013 only.

All the three countries clearly understand that creation of a liquid, competitive market in a separate country is hardly possible and are putting their efforts to create a common...
Baltic electricity market. There are several favourable preconditions for creation of this market: very well developed interconnections between the countries, good cooperation and coordination among the transmission system operators and understanding of the benefits of the common market.

The article analyses the current and future structure of the electricity generation in the Baltic countries, compares development of the electricity market opening and liberalisation in every country and discusses the necessity of creation of the single electricity market with its future interconnection to the Central European and Scandinavian markets.

2. The Baltic power system

The Baltic power system was originally built to be a part of the Soviet Union’s Interconnected Power System. Therefore, until now the Baltic power system is connected and operated in parallel with the Russian and Belarusian power systems. Power systems in the three countries are rather different: the Lithuanian system at present consists of nuclear, thermal and hydro generation, the Latvian system is based mostly on hydro generation and the Estonian one is almost purely thermal, based on local fuel – oil shale (Table 1).

Of the total installed capacity of 9 GW in the Baltic countries Lithuania accounts for about 50 %. Power generation in Lithuania is highly dependent on the country’s Ignalina nuclear power plant which covers about 70 % of the Lithuanian domestic electricity demand and is the main source for electricity exports. Apart of Ignalina, Lithuania possesses the Lithuanian condensing power plant fired by oil, gas or oremulsion, several oil and gas fired combined heat and power plants and rather big hydro pumped storage power plant. Latvia relies heavily on hydropower plants and is the only one electricity importing country. Estonia almost all electricity generates at oil shale fired power plants. Electricity balance for the Baltic countries and Kaliningrad enclave, which is connected to the Baltic power system, is shown in Figure 1.

Table 1. Installed net capacities in the Baltic countries, 2005 [1]

<table>
<thead>
<tr>
<th>Installed capacity, MW</th>
<th>Lithuania</th>
<th>Latvia</th>
<th>Estonia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>1183</td>
<td>0</td>
<td>0</td>
<td>1183</td>
</tr>
<tr>
<td>Thermal-condensing</td>
<td>1582</td>
<td>0</td>
<td>1960</td>
<td>3542</td>
</tr>
<tr>
<td>-CHP</td>
<td>910</td>
<td>528</td>
<td>342</td>
<td>1780</td>
</tr>
<tr>
<td>Hydro</td>
<td>90</td>
<td>1553</td>
<td>0</td>
<td>1643</td>
</tr>
<tr>
<td>Wind</td>
<td>19</td>
<td>27</td>
<td>22</td>
<td>68</td>
</tr>
<tr>
<td>Hydro pumped storage</td>
<td>760</td>
<td>0</td>
<td>0</td>
<td>760</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4544</strong></td>
<td><strong>2108</strong></td>
<td><strong>2324</strong></td>
<td><strong>8976</strong></td>
</tr>
</tbody>
</table>
Lithuania and Estonia were electricity exporting countries: in 2004 Lithuania exported 7.2 TWh and Estonia exported 1.7 TWh. At the same time Latvia imported 2.1 TWh. With the closure of one unit at the Ignalina NPP poses Lithuania’s export has dropped in 2005 to 3.9 TWh and may vanish totally in 2010 with the full closure of the Ignalina NPP.

Closure of the Ignalina NPP poses several hard questions to the Lithuanian electricity sector policy makers: will it be enough capacities or imports will cover the shortage? how the Kruonis hydro pumped storage plant will be operated? will a new nuclear plant be built or fossil fuel fired plants will replace the retired nuclear capacities? With the closure of the nuclear power plant Lithuania may become very vulnerable to any interruptions of the Russian fuel supplies as all natural gas and crude oil supplies are coming from Russia only and almost all electricity generation in the country is based on oil and gas.

Estonia is electricity exporting country but its oil shale generation units are becoming old, environmentally obsolete and are planned to be decommissioned until 2016. If replacement will came from gas fired power plants, Estonia will also become more dependent on the Russian supplier.

As a consequence of the historical heritage when the Baltic countries were integrated into the Soviet Union, the Baltic power system is highly integrated in terms of physical connections and system stability. Cross- border connections within the three Baltic countries are very strong, and connections between the Baltic countries and their neighbours Belarus and Russia are also strong (Table 2).

Existence of strong interconnections is a good precondition for a development of the common Baltic electricity market.

3. Liberalisation of electricity markets in the Baltic countries

Electricity market opening in Lithuania has started in the beginning of 2002 with the implementation of the Law on Electricity. The Law set the main objectives of the Lithuanian electricity sector policy, including one requiring development of a legal framework for the functioning of a
Table 2. Transfer capacity of cross border interconnections in normal operators mode, MW [2]

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Estonia</th>
<th>Latvia</th>
<th>Lithuania</th>
<th>Russia</th>
<th>Belarus</th>
<th>Kaliningrad</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td></td>
<td>1200</td>
<td>-</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>350*</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td></td>
<td>1500</td>
<td>3500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td></td>
<td>-</td>
<td>2500</td>
<td>-</td>
<td>1400</td>
<td>700</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>2200</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Belarus</td>
<td></td>
<td>-</td>
<td>-</td>
<td>700</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Kaliningrad</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td>350*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*The Estlink cable is planned to be in operation by the end of 2006

competitive electricity market. The Law defined the structure of the electricity market and determined the pace and level of the market opening. Electricity generation and supply were determined as competitive activities, prices of generation and supply were not regulated and set by the market, except if some generators or suppliers dominate in the market – in the current case some price regulation mechanism was to be developed and applied by the Regulator – National Control Commission. The Commission is also responsible for supervision of the non-discriminatory access to the grid, it sets the transmission and distribution tariffs using the incentive price regulation - price cap formulas.

From January 1, 2002 the former national electricity company Lietuvos energija was split into several independent companies, including the transmission company, two distribution companies and several generation companies. New market players - the transmission system operator, the market operator, two distribution system operators, two public suppliers and several independent suppliers were granted licenses and started their operation in a new market.

The transmission company stayed in the state hands but the two distribution companies and newly established generator companies were announced to be privatised. At the first stage of privatisation only one distribution company was sold to the biggest local retailer, privatization of the other distribution company was cancelled by the Government. Similarly, only one generation unit, consisting of one combined power plant, was sold (the other combined heat and power plants were passed in to private hands earlier), the condensing power plant was not privatised.

In 2004 the Law on Electricity was amended in order to adjust it to the latest EC Electricity Directive: full market opening was envisaged for the commercial consumers since July 2004 and for the residential consumers – 3 years later, from July 2007. At the same time the Regulator was obliged to monitor and supervise market ensuring fair, non-discriminatory access to the grid and transparent use of the grid capacities. Despite of the full market opening for all commercial consumers, number of the customers changing their supplier did not increase as only the largest consumers have done it.

No switching of the consumers is explained by the very limited competitive edge in the market with the dominant generator and significant share of supported generation (obligatory purchase of electricity produced at combined heat and power plants and renewable electricity at set prices). On the other hand, the Law on Electricity is too protective to large consumers as they have a right to switch back to the regulated tariff in case if they are not satisfied with the tariffs in a competitive market.

Market liberalisation according to the second EC Electricity Directive in Latvia was implemented with some delay, in 2005.
The high voltage grid company was established as a legally separate company, it performs functions of the transmission systems operator. All the generation (3 hydro power plants and 2 combined heat and power plants) and distribution were left in one company, only as separate affiliates. All commercial consumers were granted eligibility status but no one of them has switched to any other supplier. Liberalisation in Latvia was hindered by the political battle in the late 90’s when the Government decided to privatise the electricity company. This decision was so strongly opposed by the public that the Parliament has taken a decision to not only leave the company in the State hands but even do not allow its restructuring. All the political and legal problems were resolved in 2005 when the Parliament passed an Electricity Market Law and amended the Energy Law. The current structure of the Latvian electricity markets is shown in Figure 2.

In Estonia electricity market opening is going slower as this country was granted a derogation of the EC Electricity Directive. At present Estonian electricity market is open for customers with annual consumption over 40 GWh, representing around 10% of the market. The further market opening is planned: market opening should reach at least 35% by 2009 and full liberalisation is envisaged by 2013. The delay in market opening is caused by the Government’s desire to protect local fuel (oil shale) production and support environmental refurbishment of the existing power plants. The national electricity company Eesti Energia was restructured in line with requirements of the Electricity Directive: legally independent transmission system operator was established, electricity generation and distribution are also unbundled.

4. Common Baltic electricity market

Even before the market opening in Lithuania it was clear that the national electricity market is too small, generators are too big, with different market power, especially because of the prevailing artificially low cost nuclear power plant covering 70% and more of the domestic electricity demand, so liquid electricity market is hardly possible. Even with the closure of the Ignalina NPP national electricity market in Lithuania will be hardly competitive. The recent study [4] has shown, that concentration in the Lithuanian electricity market until 2005 was very high, and measured by the Hirschman-Herfindahl index (HHI) reached 5572. But even with the closure of the Ignalina NPP concentration in the remaining market is as high as 1904 – this marks an oligopoly situation. Therefore, competition in the Lithuanian electricity market alone will be rather limited in the nearest future.

Latvian and Estonian markets are similar, even smaller, with the only one producer clearly dominating in the market. The most obvious solution of this problem is a creation of the regional electricity market of the three Baltic States with the further its possible connection with the Scandinavian and Central European electricity markets.

As technical conditions are very favourable: strong interconnections, coordination among the transmission system operators; the only need was to create the political and regulatory level playing field in the market. Development of
the common Baltic electricity market (BEM) was highly supported by politicians, regulators and large industrial consumers. As early as in 1998 the Governments of Estonia, Latvia and Lithuania made a political commitment to develop a common Baltic electricity market. The Ministers of Economy in autumn 2001 signed a Resolution, stipulating the basic principles of the common electricity market. According to those principles, the market shall be opened for the three states using the regulated third party access to the grid.

Energy regulators of the three Baltic States, supporting liberalisation of the energy markets in their own countries, in November 2002 signed a Memorandum concerning the common Baltic electricity market [5]. The goals of the Memorandum were: to avoid discriminatory treatment of cross-border transactions ensuring the third party access, to abolish cross-subsidies, discrimination, abuse and other obstacles for the competition in the market area, to harmonise the principles of electricity pricing, to encourage the justified investments avoiding non-justified barriers to trade.

The latest developments in the Baltic States favour creation of the common market, though there are some barriers.

In Estonia electricity sector is restructured and the necessary legal framework is in place but market opening is postponed and preferential purchase from the domestic generators is set by the law. Import license is required for electricity imports (except for imports needed by the systems operator). License is not issued if in the country of import the customers eligibility level is not at least the same as in Estonia, if lower environmental standards apply or electricity pricing principles are substantially different from the ones in Estonia and it distorts fair competition. In Latvia the necessary legal framework was developed recently, in 2005, but the current structure of the electricity market with the Public supplier purchasing electricity for the regulated market may delay the real market opening. Existence of regulated tariffs for all customers in Lithuania and possibility to switch easily from the competitive to regulated prices as also structure of public service obligations has already restricted the real market opening and may cause delay in creation of the common market.

There is one specific problem requiring common approach of all the three Baltic states: electricity trade with Russia. At the early stages of the functioning of the common Baltic market there are possible threats that Russia may easily distort the market by selling there at subsidised prices. One of the
possible safeguards is to apply the principle used on the Finnish – Russian border where Finland is offering the entry capacity at a cost of 2 euro per MWh, based on the 10 year contract. This charge as a precedent may be applied on the entrance to the Baltic market area.

Another possible solution is by agreeing among the Baltic states on the acceptable volume of electricity to be imported from Russia to the Baltic states (for example, 200 MW each hour). If the amount is exceeded, then the import fee, similar like on the Finnish – Russian border, may be applied [2].

As Russia has an ambitious goal: to connect the Russian Integrated Power System with the European UCTE System and is making steps towards compatibility of the two systems, market principles, environment and technical standards will converge, and then the Baltic states may switch to more market based principles in their electricity trade with Russia.

Several studies have concluded that operation in a common Baltic market would be beneficial to all the three Baltic countries and establishing closed national electricity markets instead of the CBEM would cause a total welfare loss in the three countries. One recent study has shown that assuming competition prices, the loss would be around 250 mln. euro in Lithuania, around 350 mln. euro in Latvia and around 400 mln. euro in Estonia [4].

5. REFERENCES

1. Analysis of energy supply options and security of supply in the Baltic States and necessity to have a common energy strategy. Lithuanian Energy Institute, 2005.
3. Mikelsons K. Next steps towards Baltic electricity market. – Ibid.

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