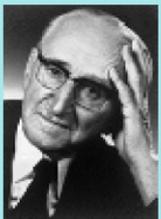




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Abstract

In the article there are analyzed the electricity market opening issues in the European Union and especially in the Baltic countries. The aim of the article is to find out and specify the main challenges for Baltic countries in electricity market liberalization process. The Baltic countries are going to face many challenges to secure their energy supply and cooperate regionally. For completion of the research task there are analyzed experiences from Scandinavian countries electricity market liberalization.

Keywords:

Economics of Regulation, Government Policy and Regulation, Regulated Industries, Electricity Market

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Challenges of electricity market liberalization in the Baltic countries

In 1996 the European Commission observed, that “as far back as 1954, energy was regarded as one of the motors of European integration since it is at the heart of economic activity and social welfare and because it is a key factor in Community solidarity”. This can be illustrated by the fact that two of the three founding treaties were primarily concerned with energy matters. In 1951 the Treaty of Paris established the European Coal and Steel Community and in 1957 the European Atomic Energy Community treaty was signed.

In 2009 energy policy has become the important topics in Europe, concerning the climate change and also the security of supply. Energy security has been traditionally defined as ‘The uninterrupted physical availability at a price which is affordable, while respecting environment concerns (International Energy Agency). Presently the focus is on climate change so that reducing carbon dependence is becoming a policy priority number one for many countries, rather than the traditional goal of reducing import dependence. The European Union is committed to make drastic reductions in its greenhouse gas emissions by transforming the way it uses and supplies energy. In its ‘20-20-20’ Climate-Energy legislative package the EU is committed to transforming its energy system to achieve a 20% reduction in greenhouse gas emissions, 20% share of renewable energy in total energy consumption (and 10% in transportation) and a 20% increase in energy efficiency, all by 2020.

Although, the energy market liberalization has taken place already for a decade, there is still long way to go to have united and integrated European energy market. Nordic countries offer good example of the well functioning united electricity market. The Baltic countries could follow the Nordic example, especially in regional cooperation and in the harmonization of rules. Baltic countries have strong interconnections and also the energy-portfolio is diversified enough that is a solid

base for the common market. For Baltic countries, the most critical issue is the import from the third countries and connections with Scandinavia and Central-European area. Both these issues are crucial to secure the electricity supply and functioning market in the Baltic countries.

In Estonia electricity production is based on oil-shale. A key issue of oil shale-based energy sector development is the consideration of environmental impacts. As the costs on environmental impacts are becoming higher, Estonia will be no longer competitive on electricity production, compared for example with Latvia, who is producing electricity mainly from renewable sources (hydro).

Aim of this paper is to explain how to build up a functioning united electricity market in Baltic countries. For this purpose following research questions are set up:

1. A normative approach to economic regulation concerning the electricity market is reviewed.
2. Analyze the major trends in the European Union electricity market.
3. What are the lessons learned from the market opening experience in Scandinavia?
4. How to build up a functioning united Baltic electricity market?

In the near future, the Baltic electricity sector is expected to go through major changes. Until recent time, the sector was characterized by vertically integrated monopolies, but at present the sector is under ongoing reform processes to meet the requirements of the EU Directives regarding liberalization of the electricity sectors. Latvia and Lithuania have already opened up their electricity markets formally; Estonia needs to open its market gradually by 2013. The three Baltic countries have to integrate regionally to guarantee the security of supply, reliable market price and effective investment environment. Baltic countries have extremely strong interconnections with third countries, which could supply over 80% total needed electricity into Baltic market area. At the same time, there are only very limited interconnections between the Baltic market and the rest of the European Union electricity market. The import of electricity produced outside the EU can significantly influence the electricity industry in the Baltic countries. With the closing of Ignalina nuclear power-plant in Lithuania, Baltic countries are soon facing the lack of production capacities in addition to the investments needed in networks.

To have the functioning market, Baltic countries need well-developed infrastructure, harmonized rules of the game, many market participants, and also common rules to deal with the outsiders and future visions. In order to ensure the secure energy supply, it is important to integrate Baltic electricity system to the EU electricity system. The most important task is to build new interconnections to unite the Baltic-Sweden and the Baltic-Polish electricity networks, and to synchronize the Baltic electricity networks with the Central-European electricity system UCTE.

Estonia will need to decide on its future of the electricity sector. Whether to build nuclear power-plant or invest in new oil-shale power-plants? What will be the CO₂ price in the future and how will it influence the competitiveness of Estonian economy? These critical questions need to be answered very soon in order to secure the future production capabilities and to be competitive in the liberalized energy market conditions.

1. Economic regulation of electricity market

Above all, talking about the regulation, it has to be considered, that electricity is different from the usual commodities. Firstly, there is inability to store power. Without the ability to store, a free market will inevitably expose consumers to huge volatility in prices. Secondly, there is a need for supply and demand to match at all times. In an electricity network, supply and demand must match at all times if the whole system is not to collapse. Without this level of control over producers, a system operator does not have the tools to ensure security of supply. Thirdly, electricity is a standard product, so markets are driven by price. And we add the lack of substitutes, environmental impacts and the central role in modern society, it is clear that the electricity market shall be regulated very carefully in order to guarantee the security of supply (Thomas, 2004).

The term “regulation” has various definitions. In the article about competition policy in regulated industries, Fehr (1998) makes firstly distinction between “economic” or “market” regulation and “technical” regulation. Economic regulation would then include competition policy, as well as the regulation of natural monopolies. By contrast, technical regulation means the qualitative regulation of products or production processes, such as imposing industry quality standards or introducing measures to promote health and safety. Some authors view last ones as part of social regulation. By Hertog (1999) social regulation comprises regulation in the area

of the environment, labor conditions (occupational health and safety) and consumer protection. Instruments applied here include regulation dealing with the discharge of environmentally harmful substances, safety regulations in factories and workplaces, the obligation to include information on the packaging of goods or on labels, the prohibition of the supply of certain goods or services unless in the possession of a permit and banning discrimination.

Also the connection between competition policy and regulation is not always clear enough and is a complex problem. Some kind of rivalry between those two shows up in certain phases during the deregulation of an industry or the transformation of former state monopolies into competitive markets. As it has been pointed out, in practice, the conflict between competition policy and regulation often arises as one between competition authorities and sector-specific regulators (Kirchner, 2004). This aspect is concerned in case of electricity market as well.

From institutional economics approach competition policy is seen as an application and enforcement of competition law by competition authorities and courts. Regulation in this context is as sector-specific regulation enforced by regulatory authorities and law courts. Competition policy is public policy instrument to prevent constraints on competition. The goal of competition policy is to keep markets free from restrictive practices in order to safeguard freedom of choice against business practices which have negative welfare effects (*Ibid*).

Traditionally, the economic regulation is applied in three following cases: for those markets, where it is clear, that competition cannot be achieved by market forces; where deviation from efficiency is deemed socially desirable; and where the social and private benefits are clearly different. In each of these cases, it is clear that a market without intervention will not result in the desired outcome.

There are primary government tasks which have to be completed in regulated sectors. These tasks are as follows (The relationship between ... 2005):

- *Technical regulation*: setting and monitoring standards, managing licenses, implementing sanctions so as to assure compatibility and to address privacy, safety, reliability, financial stability and environmental protection concerns;
- *Wholesale regulation*: ensuring non-discriminatory access to necessary core facilities, especially network infrastructures;

- *Retail regulation*: measures to mitigate monopoly pricing or behavior at the retail level;
- *Public service regulation*: measures to ensure that all consumers have access to goods that are deemed of special social value, as with universal service obligations;
- *Resolution of disputes*: quasi-judicial powers may result in faster resolution of disputes than could be provided by a non-specialized court;
- *Competition oversight*: controlling anticompetitive conduct and mergers.

Applying the framework of structure-conduct-performance paradigm we may illustrate connections between economic regulation and competition policy in electricity market by the object of intervention as follows in Figure 1.

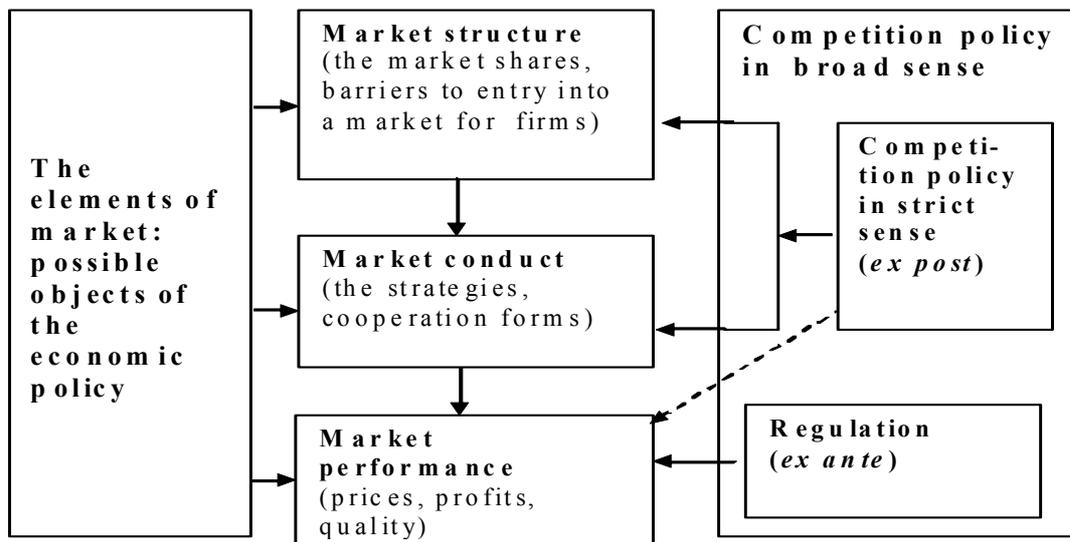


Figure 1. Competition policy and regulation in the paradigm of structure-conduct-performance

Source: Compiled by authors.

Technical regulations are not generally motivated by imperfect competition as such, but rather by other forms of market imperfections, notably incomplete or asymmetric information. Technical regulation will in most cases have economic consequences. Unlike economic regulation, technical regulation will generally not affect market power or the competitive rivalry between firms. In many cases technical regulation will mainly mean facilitating the coordination between market participants: for example, setting voltage levels in electricity networks. In other cases, technical regulation may impose costs on market participants without affecting competitive

conditions, such as when setting standards for electricity supply security. In electricity market, technical regulation has almost the same meaning as quality regulation. In general, quality problems are the result of a mismatch between prior expectations and perceived quality of the service. In the context of electricity network industry, the following three dimensions are usually distinguished: power quality, commercial quality and reliability. (Economides, 2004)

In electricity retailing, mostly imperfect competition derives from the vertical integration between retailing and distribution activities. That is at least the EU Commission official statement. The EU Commission report from 2007 shows the danger of discrimination and abuse when companies control energy networks as well as production or sales, protecting national markets and preventing competition. Report claims that such a situation also creates a disincentive on vertically integrated companies from investing adequately in their networks, since the more they increase network capacity, the greater the competition that exists on their “home market” and the lower the market price. The Commission considers that two options might be considered to redress this: a full independent system operator (where the vertically integrated company remains owner of the network assets and receives a regulated return on them, but is not responsible for their operation, maintenance or development) or ownership unbundling (where network companies are wholly separate from the supply and generation companies). Commission believes that ownership unbundling is the most effective means to ensure choice for energy users and to encourage investment. This is because separate network companies are not influenced by overlapping supply/generation interests as regards investment decisions. It also avoids overly detailed and complex regulation and disproportionate administrative burdens.

The independent system operator approach would improve the status quo, but would require more detailed, prescriptive and costly regulation and would be less effective in addressing the disincentives to invest in networks.

Vertical integration has many supporters as well. Coase (1937) was the first author, who focused on the transaction cost in his paper “The Nature of the Firm”. Coase pointed out that a firm will tend to expand until the costs of organising an extra transaction within the firm equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm.

Williamson is the well-known theorist of transaction costs. Williamson explained why companies cooperate and merge vertically. He refers to relationship-specific investments that in short-term cause high transaction-costs and in long-term agreements increase the power of the partner and favour opportunistic behaviour. Williamson explains that because parties to transactions that are bilaterally dependent are “vulnerable” value preserving governance structures—to infuse order, thereby to mitigate conflict and realize mutual gain—are sought. Simple market exchange thus gives way to credible contracting (to include penalties for premature termination, information disclosure and verification mechanisms, specialized dispute settlement mechanisms, and the like). Unified ownership (vertical integration) is predicted as bilateral dependency hazards successively build up. (Williamson, 2002)

Vertical integration decreases also the uncertainty caused by partner. Table 1 shows the most secure institutional frameworks depending on partner-specific investments and level of uncertainty. In case of specific assets and partner, who’s ability to deliver may be uncertain, it is reasonable to use vertical integration.

Table 1. Asset specificity and uncertainty

		Uncertainty		
		Low	Medium	High
Asset specificity	Low	Market transaction	Market transaction	Market transaction
	Medium	Contract	Contract or vertical integration	Contract or vertical integration
	High	Contract	Contract or vertical integration	Vertical integration

Source: Klein 2009.

Already since the late 1980s, a wave of reform has transformed the institutional framework, organization and operating environment of the electricity sector (Jamashb *et al* 2001) as other infrastructure industries in developed and developing countries (Guasch *et al* 1999; Kessides 2004). Even the structure of the power sectors and the approach to reform vary, the main objective is to improve the efficiency of the sector.

The main feature of many power sector reforms has been the market-orientation in order to achieve the efficiency objective by using the discipline of the product and capital markets to achieve allocative and internal efficiency through competition, privatization and the price mechanism (Jamashb *et al* 2001). As it has been stressed, these reforms generally have involved introduction of competition into electricity generation, design of organized power markets and unbundling of the electricity generation, transmission, distribution, and supply (or retailing) activities.

Electricity market regulation is extremely important in order to secure the security supply and also investments into the new capacities and networks. Unlike governments, individual companies carry little or no obligation to address long-term energy security or environmental challenges.

It is the responsibility of governments to ensure, through market pricing and legislative frameworks, that the market responds to these concerns. Many countries that enthusiastically started liberalizing the electricity markets, have started thinking more of the security of supply than the price.

The searches for the most competitive price have been replaced by the search for the most secure solution.

Countries are adopting incentive regulation to promote efficiency improvement in electricity transmission and distribution utilities. Abovementioned issues are still relevant for the EU electricity market, including the Baltic electricity market as a part of it, liberalization process. Therefore, next we will concentrate on the particular issues in the EU more detailed.

2. Electricity market opening in the EU

The importance of energy is revealed by the mere fact that two of the treaties establishing The European Community had energy at their heart: the European Coal and Steel Community Treaty of 1951 and the European Atomic Energy Community of

1958. The first treaty aimed at creating a common market for coal and steel and thereby established interstate and intergovernmental interdependencies that ensured economic enhancement and freedom between member-states in order to prevent the outbreak of another war.

For fifteen years the EU has gradually liberalized its energy markets. The long term development of the European energy industry is presently influenced by four major trends: liberalization and internationalization of the energy markets, strengthening of the role of the EU, concerns for climate change and increasing uncertainty over the development of fuel prices and concern about security of supply (especially of oil and gas).

According to Percebois (2008) in the EU three objectives are today considered as priorities, although their respective importance can vary among countries. These are common objectives, but the weight given to each of them is not the same in each country, because energy endowment and local constraints are different.

This is why it is difficult to implement a common energy policy today in Europe. These three objectives are:

1. The search for competitive energy; confidence in the market mechanisms is the rule, but the energy access cost must reflect the positive and negative externalities and the role of the government should be limited to creating the conditions for such an approach through CO₂ emissions trading, green or white certificates etc.
2. The search for supply security, in order to give to be priority to national resources and to encourage the diversification of imported energy sources. In 2006 the EU (25) imported 56% of its energy needs and this rate will increase in the near future.
3. The fight against global warming aiming to implement joint and cooperative policies among other countries, in the hope of preserving a threatened environment considered as a “common public good”.

The year 2007 was supposed to be a milestone towards an internal energy market: while industrial users have had the right to choose between alternative suppliers of gas and electricity since July 2004, the final deadline for opening up retail markets was July 2007. According to the Commission data, ten of the (then) 25 member-states had fully opened their markets in late 2006, in the sense that customers were entitled by law to switch suppliers (Barysch *et al* 2007). In practice, only around 10 %

of Europeans eligible to choose alternative suppliers actually did so in 2006. Also the experience from those countries that liberalized their energy markets long before the 2007 deadline, such as the Netherlands, Sweden and the UK, indicates that it can take years before households start changing suppliers (*Ibid*).

The competition in wholesale markets has remained limited in many EU countries and has been recognized that the original directives were not strong enough to open up markets. Table 2 gives an overview about customers market switching in Germany,

France, the UK and Spain in the electricity and gas markets by mid-2005.

Table 2. Market switching: percentage of customers in each category that had changed by mid-2005

Country	Consumer group	Electricity	Gas
Germany	Big business	41	*
	SMEs	7	*
	Households	5	*
France	Big business	15	14
	Households	0	0
Spain	Big business	25	60
	SMEs	22	60
	Households	19	2
UK	Big business	50+	85+
	SMEs	50+	75+
	Households	48	47

* Germany does not provide data on customer switching in the gas sector.

Source: European Commission: 'Internal market fact sheets', 2007.

The indication of the lack of competition is the strong role of the former, often state-controlled, monopolies play in many national markets. In some countries, for example Finland and Malta, the dominant position of the incumbent is the result of a small local market or an isolated location. But in other countries, as France, Greece and

Slovenia, slow progress in market opening and absence of real business opportunities for newcomers is the main reason (Barysch *et al* 2007).

In the electricity sector, France stands out among the big countries as the least open. In Germany, Hungary and the Netherlands, competition initially increased after market opening, but subsequent consolidation has reduced the number of suppliers again. In Denmark, Finland and Sweden, the number of suppliers in each market is limited, but generation and transmission tended to be fully unbundled. Also additional competition comes from regional integration in the 'Nordic power market' (see for more detailed analysis in the following sub-part), which includes Norway as well.

Conclusion here is that the EU market struggles with lot of problems. The European Commission sector research (European Commission 2007) brought up five main problems in the EU electricity market:

1. continuing high levels of concentration so incumbents maintain market power;
2. vertical foreclosure, as the old monopolists continue to own the energy infrastructure;
3. low levels of cross-border trade, due to insufficient interconnector capacity and to contractual congestion since spare physical capacity is not always released;
4. lack of transparency about operations in the wholesale energy sector, which makes it difficult for new entrants to understand how the markets work in practice and the risks that they take on;
5. lack of confidence that wholesale energy prices are the result of meaningful competition.

Market power concentration is caused by the market development that has stimulated the capital intensive energy companies within the energy sector to grow, in particular through mergers and acquisitions across national borders. During the past few years, the growth of major European power companies, such as EdF (France), RWE Energie (Germany), ENEL (Italy), E:ON (Germany) and several other large power companies, have significantly exceeded their market power. That capital concentration raises a certain number of questions as according to some observers, there is a risk of the emergence of an electro-gas oligopoly, which will control the European market and be likely to set monopoly prices. Under high competitive

market conditions, capital concentration cannot be avoided: the most competitive operators take over the less competitive ones (Percebois, 2008).

From the enterprises point of view merging has many good aspects. The main positive factors arising from the enlargement of enterprises are (Laur *et al.* 2003):

- lower capital costs ensuing from the returns to scale;
- more favourable fuel and equipment purchasing possibilities;
- possibility of dividing overhead and marketing costs between
- more consumers;
- possibility of more flexible administration of the structure of
- production capacities;
- reduced duplication of management and administration activity;
- simplified risk administration.

There is no strict rule how many market participants guarantee the competitive market. Market power needs to be strictly supervised by the Competition Authority to prevent mergers and acquisitions that could be harmful.

Vertical foreclosure consists in benefiting from a privileged position on some segments of the energy chain likely to restrict the entry of potential competitors. This form of barrier to entry arises from a situation where one operator controls an essential facility, for example, a transmission network, whose access is essential for all operators, and takes advantage of its position to distort available capacities or to make access possible while fixing prohibitive access charges. This is the reason why since 2002 the European Commission has required regulated rather than negotiated third party access charges to transmission and distribution networks; an independent commission is in charge of fixing tariffs according to "objective, clear and non discriminatory" criteria. It is also the reason, why Brussels requires, that "use it or lose it" rule has to be systematically applied. Brussels insistently requires that the network ownership unbundling becomes the rule in Europe, insofar as investment decisions on networks would be made by favoring the interest of the incumbent operator rather than the market interest. This ownership unbundling requirement is questioned by several governments and some producers which have transmission and distribution subsidiaries as in France, in Belgium and in Germany.

That opposition of operators is due to the fact that regulated activities remain very profitable, insofar as the Regulatory Commission attempts to fix network access charges which are incentives for operators to invest. (Percebois, 2008)

Low level of cross-border trade is caused by the lack of interconnections. The European electricity market is a set of regional electricity markets, while some of these regional markets exhibit a relatively high degree of concentration. EU-25 is divided into a number of “electrical islands” areas between which interconnector capacities are too limited to allow cross-border trade to equalize prices. (Bergman, 2009)

The European Commission sees the lack of interconnections between member-states as one the main reasons, why there is no single market of electricity. Commission states that connecting the remaining isolated energy markets in Europe is a priority. The Commission therefore proposes that the following six priority infrastructure actions be accepted as Community priorities:

1. Commission will develop a Baltic Interconnection Plan covering gas, electricity and storage in 2009. This will identify the key missing infrastructures necessary for the effective interconnection of the Baltic region with the rest of the EU.
2. A southern gas corridor must be developed for the supply of gas from Caspian and Middle Eastern sources, which could potentially supply a significant part of the EU’s future needs. This is one of the EU’s highest energy security priorities.
3. Liquefied natural gas and adequate gas storage are important in providing liquidity and diversity to EU gas markets. Sufficient LNG capacity consisting of liquefaction facilities in the producing countries and LNG terminals and ship-based regasification in the EU should be available to all Member States, either directly or through other Member States on the basis of a solidarity arrangement.
4. A Mediterranean energy ring now needs to be completed, linking Europe with the Southern Mediterranean through electricity and gas interconnections.
5. North-South gas and electricity interconnections within Central and South-East Europe need to be developed.
6. In line with the work of the European coordinator and the Communication on Offshore Wind tabled by the Commission together with this Strategic Energy Review, a Blueprint for a North Sea offshore grid should be developed to interconnect national electricity grids in North-West Europe together and plug-in

the numerous planned offshore wind projects. It should become, together with the Mediterranean Ring and the Baltic Interconnection project, one of the building blocks of a future European super grid.

Lack of transparency about operations in the wholesale energy sector and lack of competition can be solved by strengthening regulation and harmonization of rules as the sector inquiry confirms (European Commission, 2007). Europe needs a substantial strengthening of the powers of regulators and enhanced European coordination. Commission finds that only a strengthened regulatory framework can provide the transparent, stable and non-discriminatory environment that the sector needs for competition to develop and for future investments to be made. European Commission finds that main ingredients of such a strengthened framework should be:

- enhanced powers for independent national energy regulators,
- reinforced coordination between national energy regulators,
- reinforced cooperation between transmission system operators (TSO),
- substantially enhanced consistency of regulation in cross-border issues.

Commission has stated also that reinforced coordination between national energy regulators, with a stronger role for community oversight to ensure the internal market interests, particularly as regards cross-border issues and areas most critical for market entry, will be necessary to overcome the current regulatory cross-border gap which cannot be remedied by application of competition rules alone.

Today energy markets liberalization has redirected its focus to the most secure solutions with the less environmental impacts. Energy policy has become the most important issue in the EU foreign policy and member-states are more and more interested in common energy policy that can provide the whole union with the secure supply of electricity. Clear action plan is made in order to build the connections between the countries: the EU-25 is divided into a number of “electrical islands” areas between which interconnector capacities are too limited to allow cross-border trade and to have the functioning market.

EU has clearly stated in the third energy package to take actions to form a real functioning market: that is balanced, diversified, secure and environmentally sustainable.

3. Lessons learned from opening up the electricity markets in Scandinavia

All Nordic countries have liberalized their electricity markets, opened electricity trading and electricity production to competition. In the past, each of the four Nordic countries the national electricity market exhibited a high degree of concentration, with a publicly owned power company having a dominating position. The first step towards the creation of the Nordic market was taken in 1996, when the border tariffs between Norway and Sweden were abolished and the common power exchange (Nord Pool) was established. Finland joined the market in 1998 and the process was completed in 2000 when Denmark was fully integrated into the Nord Pool system (Bergman, 2009).

The creation of Nord Pool and the elimination of border tariffs between the Nordic countries were key elements in a strategy aiming at an integrated Nordic market for electricity. Nord Pool operates both a common power exchange (a spot market) and forward markets for electricity. Around 30 per cent of the total electricity consumption in the Nordic area is traded on the Nord Pool spot market, while the total forward market turnover amounts to about five times the spot market trade. The day-ahead wholesale markets acts as a single market when the grids allow it, while a shared mechanism for allocating interconnections divides them again into distinct zones when the grid becomes overloaded. The rules and regulations governing transmission pricing and interconnector congestion management ensure the efficient functioning of the market. The prices of transmission services are independent of the location, and of the distance between, buyers and sellers, and interconnector congestion fees are positive only when net demand exceeds capacity. There are still four national transmission system operators (TSO), but from the point of view of the functioning of the common market there is a very close cooperation between them. There is also an efficient flow of relevant information about expected load and interconnector capacity utilization between the TSOs and Nord Pool. (*Ibid*)

Nordic market offers many positive examples of liberalization. One example is from the critical issue: whether an unregulated generation and supply industry can survive the potential back-lash from a period of high prices caused by shortages (in this case, of rain for the hydro reservoirs). Both Norway and Sweden suffered from a supply shock in 2002-03, due to unexpectedly dry weather. In the second half of 2002, inflow to hydro reservoirs was only 54% of the average of the proceeding 20-year

period. Foreseeing tighter market conditions, producers began restricting supply in late autumn and prices started to rise. The daily average spot price peaked at normal 850 NOK/MWh (115 EUR/MWh) in January 2003, two to three times in the normal level. Many customers received electricity bills which were 50% higher than usual. There was speculation that high prices were the result of abuse of market power, as well as a lack of investment in both generation and transmission in earlier years, and that rationing on a massive scale would be required. As it turned out, no such drastic measures were needed, as responses from consumers and thermal-power producers balanced the market. Even though prices remained high during most of 2003, market conditions gradually normalized. The Nordic experience suggests that consumers can reduce demand appreciably in response to sustained increases in electricity prices, provided the wholesale prices feed through into retail prices and are not distorted by market power supported by high switching costs. When the reasons for high prices are clear and understood (low reservoir levels) there appears to be no need for regulatory intervention. (Newbery, 2009)

Second good example can be brought from the “national interests” that sometimes are brought as one the obstacles in creating one united market. In the context of the shared management of Nordic interconnections, simultaneously defined the effective size of their common market and the volume of energy allowed to transit between the submarkets during periods of market splitting. The Swedish TSO; which is not really a firm, but a government body, is apparently obligated to prioritize Swedish interests when the conflict with the optimal usage of the Nordic common market. The advantage of the Swedish example is transparency– things are stated with such clarity among partners sharing a common wholesale market. (Glachant *et al.* 2009)

Nordic countries are the ones that have also progressed in the development of incentive pricing structures which as a result leads to the competitive market. The grid access fee no longer consists of only annual fee covering all TSOs expenses (except the costs of balancing) and in which access to the grid is no longer free for generators. It is considered differently in France and Germany, where the consumer basically pays all the costs for the whole service. It is difficult to imagine how a competitive market can function smoothly in the long term using such costly infrastructure (60% of the wholesale price of energy) without delivering appropriate economic signals to the market operators. (*Ibid*)

As the most of EU suffers from the high concentration of producers, Nordic countries also here offer quite good example: for instance, Vattenfall's share of the relevant market has been reduced from around 50% to around 20% by geographically extending the market. Integration has managed to eliminate potential market power. The factors listed below, seem to have been instrumental in preventing market power from being established, maintained and exercised in the Nordic electricity market (Newbery, 2009):

1. A low degree of concentration – as a result of market integration, the degree of concentration is low.
2. Competition policy - prevention of mergers and acquisitions that could be harmful.
3. Forward contracting
4. Clear market rules
5. A significant share of hydropower in the generation mix.

If Norway and Sweden are being compared, where regulations are similar, the retail markets nevertheless seem to perform quite differently. Average retail prices were considerably lower in Norway than Sweden in the early period, and the explanation lies in the switching costs. Norway used profiles to determine bills while Sweden required expensive interval meters to switch to a new supplier until it moved to profiling in 1999, after which retail prices moved towards Norwegian levels. Well-functioning retailing market is characterized by the following points (Bergman, 2009):

1. Free entry on the supplier side – any prospective company is free to start trading electricity;
2. A low degree of supplier concentration;
3. Transparent prices and conditions for electricity offered;
4. Free choice of supplier and contracts;
5. No charge for switching suppliers.

As the result of this there has been a greater volatility of average residential end-users prices along with this development, reflecting the monthly, seasonal and annual variation of spot prices. Furthermore, there have been fewer variations in the contract prices offered to consumers, indicating increasing competition between suppliers. Customers may freely choose a contract from a new supplier directly on the internet and the engaged company will take care of the necessary changes

(cancellation of old contracts etc.). Customers may choose among three board categories of contracts reflecting various degrees of price risk: fixed price contracts, spot price contracts and variable tariff contracts. Fixed price contracts may be various lengths (one year of three years) 64% of the household prefer contract where the tariff may be changed at short notice (14 days) (*Ibid*).

Nordic electricity market is considered to be one of the most successful ones in Europe. The united market has been able to keep in balance also in case of shortages. The rules and regulations governing transmission pricing and interconnector congestion management ensure the efficient functioning of the market. There are four national TSOs, but clear and transparent rules guarantee effective cooperation between. The conditions for consumers allow to flexibly switch the suppliers and to choose from different categories of contracts. Nordic countries have also managed to eliminate the threat of market power concentration. Baltic has a lot to learn from Nordic, especially in sense of cooperation between the countries as well the flexibility towards the customer.

4. Electricity market opening in the Baltic countries

In the years to come, the Baltic electricity sector is expected to go through major changes. Recently, the sector was characterized by vertically integrated monopolies, but at present the sector is undergoing reform processes to meet the requirements of the EU Directives regarding liberalization of the electricity sectors.

Baltic electricity markets peak load is nearly 5000 MW, having 3 million customers with consumption of 27 TWh/year. There are 3 large national utilities, plus 300 small and medium independent producers. There is no internal bottlenecks, 350 MW connection to Finland and over 3000 MW connections to Russia. Estonia, Latvia and Lithuania are part of BRELL ring, which connects the Baltic, Belarus and Northwest Russia. The Baltic States' electricity network is often described as an island in the European Union. There is only one transmission link with the rest of the EU, cable connecting Estonia to Finland. Transmission capacity with Russia is on the other hand well developed, because the electricity grid of the Baltic countries is integrated into the North-West Russian grid for historical reasons. This is a cause for serious concern, although so far no serious incidents with political undertones have taken place, contrary to recent events in the supply of natural gas.

Estonia and the other Baltic states are among the countries most dependent on external energy sources. A problematically big amount of Estonian, Lithuanian and Latvian energy comes from Russia, one way or another. As regards energy issues, the three Baltic states are rather bound, and in quite a similar situation. (Mälk, 2007)

Degree of market opening (implementation of Directive 2003/54/EC) is different in three countries: Latvia and Lithuania have formally opened their electricity market, but Estonia is going to do it in the nearby future. Baltic markets act separately and as already the history has shown regarding the Ignalina nuclear power-plant, it is very hard to reach the common understanding about united action.

The Estonian electricity sector is organized around a vertically integrated utility – *Eesti Energia AS* – a state-owned enterprise that controls the generation, distribution as well as detail sales throughout almost all of the country. Formally all business units are separated. In 2009 the separation of transmission system operator Elering from Eesti Energia started and it will be 100% direct state ownership by 2010 at the latest.

Estonia will open 35 % of its market in 01.04.2010 and 100% probably by year 2013. All business-consumers (over 2 GWh) have to buy electricity from the stock-market starting from 01.04.2010. Stock-market will allow also the Russian electricity to enter the market. At the moment there are 4 licensed electricity-sellers in the Estonia and active research is being done also by the Nordpool market participants.

In Latvia, the real market opening has taken place in the amount of 55% (of total end consumption), as customers with turnover more than 10 MEUR or more than 50 employees have to purchase electricity for the market price. There is also a kind of discrimination for the newcomers: network tariff has been raised only for new supplier's customers, while tariff for old supplier's customers have remained the same 01.08.2007 the transmission tariffs were increased and 01.02.2008 the distribution tariffs were increased. Up to 01.04.2008 customers purchasing from new supplier should use higher network tariffs and customers of old supplier enjoyed old lower tariffs. Network operator asked from new supplier's customers to pay for additional metering equipment to be installed due to switching of supplier. Producers get subsidies only if they sell electricity to old supplier. Regulated cost-based tariffs are still available for all customers. Majority of small producers do not sell electricity to the market because of loosing subsidies. New suppliers are not interested to enter

because of higher tariffs in network services and huge risks in delivery forecasting. Foreign producers and suppliers cannot access to the market because of restrictions in cross-border trading. Latvenergo has the only open supply agreement over Latvian border, instead of TSO. No other trader has right to do so. (Arukaevu, 2008)

In Lithuania, the spot-market started operating on the 1st of January, 2010. The Ignalina nuclear-station was closed in the end of 2009 and this raised the price of electricity reasonably. The price jumped from 20 €/MWh to 52 €/MWh within a first week. Currently, nearly 30% of the whole electricity need is covered by the import from Russian. There are 20 participants in the spot-market. Before 2010, the electricity market was also opened only formally. For example: new supplier was obliged to submit delivery plans separately for each customer: so this means that having 100 customers the new supplier had to send 100 separate delivery plans. At the same time, old supplier had to send only one delivery plan in the same case. Also as in Latvia, majority of small producers do not sell electricity to the market because of losing subsidies and new suppliers are not interested to enter because of higher tariffs in network services and huge risks in delivery forecasting. For import and export permit are needed and there is no clear procedure how to conduct import and export. Also there is a mandatory auctioning of electricity imported or exported by traders. (*Ibid*)

One big problem for the Baltic region is the possible import from third countries. Lithuania is already having debates whether they should negotiate with Russia from special agreements for buying electricity. Baltic countries have already extremely strong interconnections with third countries, which could supply over 80% total needed electricity into Baltic market area. The import of electricity produced outside the European Union can significantly influence the electricity industry in the Baltic countries.

To prevent market failure and support fair competition in the European Union energy market, Estonian Government has proposed that electricity import has to be part of the emission trading system. Otherwise, there could be a situation where a neighboring non-EU state creates an unknown amount of greenhouse gas emissions in electricity production that is sold to the internal market. This may also motivate the EU companies to transfer their production into third countries, which will increase carbon leakage. The second reason creating a demand for electricity import control is

possible market distortion. Electricity produced in third countries under lower environmental requirements is likely to be of less cost compared to electricity produced in internal market. Producers that are obliged to meet environmental requirements and EU climate policy cannot compete on equal grounds with those who have no such obligations. It would be unfair to give third country producers with lower environmental and production quality standards advantage over producers within the internal market. Estonia proposed that for third countries the custom-tariff would be in the same amount as the CO₂ quota bought from the action.

Currently there is a discussion on common regulation in the EU, how to approach the issues of electricity imports from third countries. Liberalization of power markets and emission trading scheme has made it very attractive for the third countries' power producers to enter these markets with their power suppliers and for the member states difficult to apply any measures against such imports. Mitchell (2009) finds in his article „ Europe's Energy Security After Copenhagen: Time for a Retrofit?“ that this question could be in principle solved in the frame of World Trade Organization (WTO). According to him, solution has become more relevant than earlier, as now the Saudi Arabia and the Gulf Cooperation Countries are members, as are the South American exporters. The big exceptions are Russia, Iraq, Libya and Algeria. If and when these countries join the WTO, their accession would provide some opportunity to negotiate matters affecting energy security (Mitchell, 2009). The vice-counsellor of the Ministry of Economic Affairs and Communications opposes it, saying that Estonia itself made several proposals to the chairman and the Commission for solving the problem, but the rules of the WTO prohibit any restrictions to the electricity trade. (Kisel, 2008)

The possible future for Baltic states would be creating a joint Nordic-Baltic energy market that would be efficient, provide energy security, and reduce the environmental impact of energy production.

For developing a joint well-functioning electricity market, it is important to link the Baltic and Nordic countries with new interconnections and simultaneously ensure the smooth functioning of the Baltic electricity market. Current regulation in Estonia, Latvia and Lithuania does not support the development of a joint efficient electricity market. With the help of different regulatory schemes, Baltic countries have been

supporting domestic electricity producers, thus significantly distorting the development of a joint electricity market. (Kisel, 2008)

Baltic countries could form united market similarly to the Nordic countries (Norway, Sweden, Finland and Denmark) that merged their electricity markets building on the systems created in Norway in 1991. Like the Nordic market that had many advantages: national systems were complementary in resource terms (Norway is hydro based while Denmark is fossil-fuel based with Sweden and Finland using a mix); Estonia, Latvia and Lithuania have diverse energy mix in electricity generation by technology and fuel.

One of the important issues is also the investments into new generating capacities, as the Baltic region is starting from 2010 facing a lack of generation facilities. The early experience with reforms during the 1990s suggested that competitive wholesale markets could and would mobilize adequate investment in new generating capacity. Substantial amounts of capitals were mobilized during the late 1990s to support constructions of new efficient generating capacity in many countries that have implemented the reform. About 40% of the stock of generating plants in service in England and Wales was replaced with modern efficient combined-cycle gas turbine (CCGT) technology between 1990 and 2002 as old coal-burning generators have been closed and expensive dirty coal plants have been displaced by cheaper and cleaner CCGT capacity. On the other hand, many EU countries entered the liberalization era with excess generating capacity and are only now facing „supply security“ issues that may arise if competitive markets do not provide adequate incentives to stimulate investment in new generating facilities consistent with economic and reliability goals. (Glachant *et al.* 2009)

Latvia and Lithuania have opened up their markets, Estonia needs to do that by 2013. The three Baltic countries have been unable to coordinate their electricity markets so far, though each of them is small and very simply structured.

Baltic countries need to consider what would be the best for the whole region and take the needed steps in order to move the barriers from united electricity market at least by 2013. Also, the cooperation has to be done to face the future lack of production capacities. In order to have the functioning market, Baltic countries need clear and harmonized rules, many market participants and common future visions.

Conclusion

The third energy packet that was approved by the European Parliament in December 2008 pointed out the non-functioning united market need for common energy policy in the EU. Mainly the market is non-functioning as the European electricity market is a set of regional electricity markets. EU-25 is divided into a number of “electrical islands” areas between which interconnector capacities are too limited to allow cross-border trade to equalize prices. Besides that, quite many of these regional markets exhibit a relatively high degree of concentration. Common energy policy of EU is extremely important for Baltic countries as it includes also the rules for electricity import for the third countries, which is the potential threat. As a bottom line, today energy markets liberalization has redirected its focus from search for the lowest price to search for the most secure solutions and well the search for diversified sources of energy that could provide the supply even in case of war or crises. Energy policy has become the most important issue in the EU foreign policy and member-states are today more interested in common energy policy that can provide the whole union with the secure supply.

The three Baltic countries have much to learn from the Nordic neighbors. First of all, the regional cooperation in the form of Nord Pool that enables to secure the supply also in case of shortages. As in Nordic countries, Baltic countries should also unite their main grids into one unit and operate this in cooperation. Clear and transparent rules need to be introduced, to avoid possible “national interests” conflicts. Secondly, Nordic countries have well-functioning retail market that is flexible towards the customer.

Baltic countries could logically form one united regional electricity market. There are strong interconnections and also the energy-portfolio is diversified enough (oil-shale, hydro, nuclear).

Similarly to Nordic energy market, Baltic market could have one spot market and the main grids should be united into one unit. The common market starts from harmonizing the rules. Firstly there is a need to remove formal and informal barriers from electricity markets so that export and import could take place freely. Next step would be harmonization agreements between regulators (rules for reserves and balancing, access to interconnections and congestion management, compatibility of access and connection fees, joint approval of investments in the grid). Baltic

countries need also consider the possible cooperation in the sense of production capacities. Lithuania is facing the lack of capacities already at the beginning of year 2010. Lithuania is capable of producing the half of the electricity need and the rest is planned to buy from the open market. This could either speed up the formulation of a common market or either increases the Lithuania's dependency on the Russian energy. Baltic countries have a good possibility to start thinking and acting in united way, to secure the functioning common market and energy supply in the future.

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