ELECTRIC ENERGY COOPERATION IN THE BALTIC SEA REGION AND THE ROLE OF RUSSIA IN IT

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This article examines cooperation in the electric energy sector in the Baltic region. The author explores the existing undersea HVDC power exchange projects. It is emphasised that cooperation in the electric energy sector is concentrated largely in the EU member states despite earlier plans to establish the Baltic energy ring, which would also include Russia and Belarus. The author stresses that one of the most acute problems for the EU today is overcoming isolation of the energy systems of the Baltic States (Lithuania, Latvia, and Estonia) from that of the major part of the EU. This task has become especially relevant after the closing of the Ignalina NPP (Lithuania), which used to be the primary energy source for the three Baltic States. The article examines key projects of the construction of new international power transmission lines in the framework of the Baltic Energy Market Interconnection Plan (BEMIP) and the prospects of the Visaginas NPP (Lithuania) in solving energy problems of the Baltic States. The author analyses Russia's role in the electric energy market and focuses on a possible increase of the country's energy market share following the construction of the Baltic NPP and the export of generated electric energy to Poland, Lithuania, Germany, and Sweden. The author concludes that the prospects of Russia's energy export to the Baltic Sea region will be determined not only by technological, economic and market factors, but rather by the general state of relations between Russia and the EU. Moreover, a lot depends on Lithuania's decision on the construction of the Visaginas NPP, as well as the way the EU and the Baltic States solve the problem of energy supply in case the NPP project is terminated.

Key words: Baltic Sea region, Russia, European Union, epelectric power industry, electricity export, electricity market, electrical grid

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Submitted on April 5, 2013

doi: 10.5922/2079-8555-2013-2-7

Energy cooperation has been developing in the Baltic Sea region since 1960, although at that time, it was limited to the Nordic countries. The energy association Nordel, which brought together Finland, Sweden, Norway, and East Denmark, was established in 1963. Undersea high-voltage direct current cables were laid between the countries of the region (table 1).

Table 1

Undersea high-voltage direct current (HVDC) cables in the Baltic region

Name	Commissioned	Countries	Total length, km	Transmission capacity, MW
Konti-Skan 1	1965 (decommission in 2006)	Sweden — Denmark	173 (87 of the undersea section)	250
Skagerrak 1 and 2	1976—77	Norway — Denmark	240 (127 of the undersea section)	2 × 250
Konti-Skan 2	1988	Sweden — Denmark	149 (88 of the undersea section)	300
Fenno-Skan 1	1989	Sweden — Finland	233 (200)	500
Skagerrak 3	1993	Norway — Denmark	240 (127 of the undersea section)	440
Baltic Cable	1994	Sweden — Germany	262 (250 of the undersea section)	600
Kontek	1995	Denmark — Germany	171 (52 of the undersea section)	600
SwePol	2000	Sweden — Poland	254 (239 of the undersea section)	600
Estlink	2006	Estonia — Finland	2 × 105 (2 × 74 of the undersea section)	350
Fenno-Skan 2	2011	Sweden — Finland	270 (200of the undersea section)	800

Compiled according to [1; 2].

In the early 1990s, the first propositions regarding the creation of the so called Baltic Electricity Ring were voiced. In May 1998, the Baltic Ring Electricity Cooperation Committee (BALTREL) was established to promote the idea of a common electricity market in the Baltic Sea region. It brought together representatives of 11 countries: Belarus, Germany, Denmark, Latvia, Lithuania, Norway, Poland, Russia, Finland, Sweden, and Estonia. Moreover, 17 largest power suppliers of the aforementioned countries take part in the work of the committee.

It was planned to integrate the energy systems of the Baltics (Lithuania, Latvia, and Estonia), Belarus, and Russia into the power market of Poland and the Nordic countries in the framework of BALTREL. The Baltic States were expected to become somewhat of a transit hub for electric power exchange between east (Russia and Belarus) and north-west Europe. The possibility of constructing new generating facilities (NPPs) was also entertained at that time. However, the EU plans shifted in another direction. They posited integration of the Baltics into the EU energy system and reduction in their dependence on Russian energy resources rather than cooperation with Russia and Belarus. This means that energy integration in the Baltic Sea region is interpreted, first of all, as integration within the EU [for more detail see 3].

Further prospects of BLATREL are unclear. There is still no credible information on the termination of the work of the committee, but its official website (www. baltrel. com) is up for sale.

It should be emphasised that by the time the countries acceded to the EU, the electric energy networks of the Baltics had not yet been connected to the networks of other EU member states. They exchanged electric energy only among themselves and also received it from Russia and Belarus in the framework of the BRELL Loop agreement concluded on February 7, 2001. The first step towards the integration of the Baltics into the EU energy markets was made only in December 2006, when the Eastlink undersea (submarine) transmission line between Estonia and Finland was put into operation (table 2).

Table 2

Power connections among the Baltics and between the Baltics and the neighbouring countries

Countries	Number of lines (330 kV)	Transmission capacity (one direction), MW
Estonia — Russia	3	1400
Estonia — Latvia	2	1400
Estonia — Finland	1	350
Latvia — Russia	1	400
Latvia — Lithuania	4	1300
Belarus — Lithuania	5	1400
Russia (Kaliningrad region) — Lithuania	3	700

Compiled according to [4; 5].

The only net power exporter among the Baltics is Estonia whereas the most difficult situation is observed in Lithuania. This country, which was a net power exporter in 2009, turned into a net importer after the closure of the Ignalina NPP (table 3).

Table 3

Power export and import in the Baltics in 2011 billion kWh

Country	Power export	Power import	The share of net power import (export — import) within total consumption, 2011,%
Estonia	5252	1690	0
Latvia	2764[1]	4009[1]	17.0
Lithuania	1970	8710	59.0

[1] Including transit.

The isolation of Estonia, Latvia, and Lithuania from the EU energy networks is one of the key issues in the EU Strategy for the Baltic Sea Region presented in June 2009 and adopted in October the same year [10]. The Baltic Energy Market Interconnection Plan (BEMIP) was adopted in order to solve this problem; the corresponding memorandum of understanding was signed by eight EU member states situated in the Baltic Sea region[1] on June 17, 2009 [11].

Compiled according to [6—9].

The key projects for the creation of new international transmission lines to be implemented in the framework of BEMIP are the following ones [12]:

- conversion of the existing 220 kV double circuit line into a 400 kV line between the towns of Krajnik (Poland) and Vierraden (Germany) (2015);
- 3rd interconnection (400 kV) between Poland and Germany (Baczyna/Plewiska — Eisenhüttenstadt) (after 2015);
- construction of the Elk — Alytus interconnection line (a 400kV double circuit with the construction of 2x500 MW BtoB converter stations) (2015);
- 3rd interconnection between Estonia and Latvia (2020);
- 2nd HVDC interconnection with a submarine cable of 650 MW capacity between Estonia and Finland (Estlink2, 2014);
- HVDC submarine cable of 700MW capacity between Sweden and Lithuania (NordBalt, 2015);
- HVDC submarine link between Norway and Denmark (Skagerrak IV, 2014);
- South-West link between Norway and Sweden (2019).

For the Baltic States (especially, Lithuania), it is particularly important to secure external power supply, since the second power unit of the Ignalina NPP was closed down on December 31, 2009. The first power unit was

[1] Denmark, Germany, Estonia, Latvia, Lithuania, Poland, Finland, Sweden.

taken out of operation on December 31, 2004[2] as part of the country's accession agreement with the EU[3].

An attempt to prolong the operation of the Ignalina NPP at least until 2012 through the adoption of a corresponding resolution by the European Parliament, which was proposed by the Lithuanian ex-president, a member of the European Parliament, Rolandas Paksas, turned out to be futile. The European Commission and the European Council reacted to the draft resolution with a comment that 'the time to make any exceptions had passed' [14].

The closure of the Ignalina NPP, which accounted for almost 70% of the national electricity consumption, put Lithuania into a difficult situation. Moreover, the NPP-generated electric energy was also supplied to Latvia and Estonia. Thus, as early as 2006, Lithuania, Latvia and Estonia signed a communique calling for the construction of a new Visaginas NPP on the site of the closed plant. Later, Poland joined the project. In 2011, the Japanese company Hitachi Ltd and the Japanese-US joint venture Hitachi-GE Nuclear Energy, Ltd. (Hitachi-GE) were selected as strategic investors [15]. At first, it was planned to construct two reactors with the total capacity of 3400 MW, but Hitachi project suggests the construction of only one advanced boiling water reactor (ABWR) of a capacity of 1350 MW [16]. However, a number of serious problems arose, which questioned the implementation of the project.

Firstly, the initially announced period of the NPP construction (2015) turned out to be completely unfeasible (not to mention the consequences of the 2008 economic crisis). The years 2020—2022 are considered to be a more realistic completion deadline [17].

Secondly, there is a lack of clarity about the financing estimated at 4.6—5.2 billion euros [18]. Lithuania is not capable of implementing such large-scale projects on its own, and the number of participants is reducing. So, in December 2011, Poland put freeze on its participation in the project; the country is planning to construct its first NPP by 2025 [19; 20].

Thirdly, at the referendum, which was held on October 14, 2012, 62.7% of voters opposed the idea of the construction of the Visaginas NPP [21]. Although the referendum was non-binding, the Lithuanian authorities cannot ignore the opinion of their citizens. In December 2012, the Lithuanian Seimas adopted a resolution, according to which the government had to "develop and present to the Seimas of the Republic of Lithuania an economically viable and consumer friendly electric energy supply strategy" in view of the referendum

[2] The Ignalina NPP (Visaginas, Lithuania) contained two RBMK-1500 water-cooled graphite-moderated channel-type power reactors (the Chernobyl type), each of a capacity of 1500 MW. Unit 1 came online on December 31, 1983, Unit 2 — on August 31, 1987. The construction of Unit 3 started in 1983, but was suspended in 1987 due to the protests of environmental organisations and the deterioration of economic situation in the USSR and was completely stopped in 1989. The construction of Unit for has never started. The NPP was designed to operate till 2028—2032.

[3] The influential British weekly newsmagazine The Economist stresses that, as to the EU's requirement to close the Ignalina NPP, "no engineering or safety case for this was ever made: the requirement was a political one, sprouting from a neurotic strand of greenery in Western Europe" [13].

results and to “draft the corresponding legal acts or introduce changes thereto and present them to the Seimas of the Lithuanian Republic until May 15, 2013” [22]. The government of Lithuania intends to examine the proposals of the Visaginas project working group in April 2013 [23].

So, the EU countries are rapidly developing energy cooperation in the Baltic Sea region. What role does and can Russia play in this cooperation?

Russia also participates in energy cooperation in the Baltic Sea region. In 2012, it exported 4.78 billion kWh to Lithuania (the country accounts for 26.0% of the Russian export, ranking first in these terms) and 3.79 billion kWh to Finland (20.6%, ranking second) [24]. The export capacity, which reached its peak (11.3 billion kWh) in 2003, has been decreasing since 2009 with a steep decline in 2012 (by 60.6%) [24; 25]. The main reason behind it is that Russian electricity is too expensive. For instance, in the first half of 2012, an average market price for Russian electricity reached 40 euros per MWh, whereas an average prices in the energy market of the Nordic countries and the Baltics (Nord Pool) was only 33 euros per MWh (as a result of hydropower plants generating cheap electricity). Taking into account the existing trends in the Russian and Scandinavian power markets, experts of the RIA Rating agency came to a conclusion that in the near future, Russia would not export electricity to Finland but import it from the country [26; 27].

Russian electricity export to Lithuania increased dramatically in connection with the closure of the second power unit of the Ignalina NPP (in 2010, the increase was tenfold in comparison to 2009). However, it is decreasing now: in 2012, it reduced by 13.8% [24]. Just as in the case of Finland, the situation was influenced by the pricing in the Nord Pool electric energy derivative exchange, which Lithuania joined in 2010, as well as by the measures aimed at the liberalisation of electricity market pursued in the country since 2010. However, Russia still accounts for 56.2% of the Lithuanian electric energy market and 45% of its total consumption (2012) [28; 29].

Another factor contributing to the deteriorating position of Russian electricity in the Lithuanian market and the market of the Baltics in general is the agreement between Estonia, Latvia, and Lithuania concluded on March 15, 2013 and coming into force on June 3 the same year. According to this agreement, Russian electricity suppliers can sell electricity to the Baltics only with the mediation of the Nord Pool Spot exchange and only via the ‘pricing’ region of the Lithuanian-Belarusian border. According to Taavi Veskimägi, chairman of the Board of Directors of the Estonian system operator “Elering", if there were no such an agreement, there would be fewer opportunities for energy trade between the Baltics, which would facilitate Russian electricity export to the local markets [30].

In this situation Russian energy export plans are connected, first of all, with the Baltic NPP, which is being erected 13 km south-east of Neman (Kaliningrad region). The decree of the Government of the Russian Federation on its construction was signed on September 25, 2009. The foundation of the NPP was laid on February 25, 2010.

Two pressurised water reactors of the VVER-1200 type of a capacity of 1194 MW each will be installed at the plant. The first power unit is scheduled to be put into operation in 2016, the second — in 2018 [31]. It is the first Russian NPP, 51 % of which will be publicly owned and 49 % will belong to private investors (including foreign ones). At the moment, the Rosatom state corporation and OAO Inter RAO UES are in negotiation with several potential international strategic investors on their participation in the project [32].

At first, the Baltic NPP was oriented not only towards satisfying energy demand of the Kaliningrad region, but also towards export of electric energy to the Baltic States, Poland, Sweden, and Germany [31, c. 3]. OAO RAO Intern UES — the future operator of electricity export from the Baltic NPP — considers several options for its export.

Firstly, it is electricity export to Poland through new transmission lines between Mamonovo and Elblag. The transmission capacity can reach 600 MW (according to other data — 5090—1000 MW), the export capacity can achieve up to 4.8 billion kWh; the estimated completion time is 2016—2017 [33; 34].

In May 2010, Russia invited Poland to take part in the construction of the Baltic NPP and, later, jointly sell electricity to Europe [35]. At that time, no response was given to the invitation. But in November 2012, the Polish Minister of Transport, Sławomir Nowak, announced that "Poland may consider the possibility of integrating its energy system with the Baltic NPP in the Kaliningrad region" [36].

Secondly, it is electricity export to Lithuania. In March 2011, Inter RAO UES signed an agreement with Inter RAO Lietuva on the supply of electricity generated at the Baltic NPP to Lithuania at a rate of 1000 MW per year with a possibility of increasing this amount from 2019 [37]. To achieve this goal, it is planned to improve the existing network infrastructure between the countries. The expected supply capacity is 2.4 billion kWh [34]. The NordBalt undersea (submarine) cable could also transmit electric energy from Lithuania to Sweden. The joint operation of the Baltic NPP and the Lithuanian Kruonis Pumped Storage Plant (which could buy the cheap NPP electricity during night time, and sell it at a higher price during daytime) also seems quite promising [38].

However, the Lithuanian authorities oppose the idea of the Baltic NPP, being the only Baltic state that did not agree to hold bilateral consultations on its construction. In March 2013, Lithuanian Prime Minister Algirdas Butkevičius said: "I have never participated in any Kaliningrad NPP projects and have no intention to participate in such projects in the future…" [39].

The main reason behind Lithuania's negative attitude is that the Baltic NPP means direct competition for the Visaginas NPP; and the former is very likely to be put into operation much earlier than the latter. At the same time, in view of the power deficit in the Baltic Sea region forecasted for 2020, Rosatom does not feel any competition between the two projects and is ready to discuss Lithuania's participation in the construction of the Baltic NPP, as well as consider export of cheap electricity to this country [40].

Thirdly, it is the cable from Mamonovo to Bentwisch in Mecklenburg-Vorpommern laid under the Baltic Sea [33]. It would allow Germany to partially compensate for electricity deficit, which will become particularly noticeable after the closure of all NPPs scheduled for 2022. The project's characteristics are as follows: a transmission capacity of 800—1000 MW, a supply capacity of up to 8 billion kWh, the estimated completion time is 2019—2020 [34]. In January 2013, the Munich Environmental Institute announced that the federal government planned to transmit electricity from the Baltic NPP in Kaliningrad via the Baltic undersea route to Germany [33]. However, the federal government emphasised that such phrasing was not quite correct and the final decision was made by energy companies rather than the federal government and the energy import and export was a usual practice [41].

The technological aspect of these plans suggests the integration of the Kaliningrad region into the European Network of Transmission System Operators for Electricity (ENTSO-E). This intention of the Russian Federation has already been announced by the European Commission. Russia also wants to include the construction of at least one interconnection to Poland and Lithuania in the BEMIP and receive EU financial support for the construction purposes [42].

Alongside the Baltic NPP, there are other projects aimed to expand Russian electricity export to the Baltic Sea region countries. So, there is a plan to lay a submarine direct current cable under the Gulf of Finland from the Leningrad NPP-2, which is currently under construction, with an overland section in the Vyborg district of the Leningrad region to ensure power export to Finland.

The Baltic Sea region has a large market for Russian electricity, first of all, electricity generated by the Baltic NPP. However, this circumstance is not sufficient to forecast a growth in Russian electricity export to the markets of the Baltic Sea region states. One should take three factors into account.

Firstly, Russian electricity should be competitive price-wise. It is expected that in 2015 an average electricity price in the Kaliningrad regional wholesale market will reach 4.3 euro cents per kWh, whereas, in the market of the Baltics it will amount to 5.5 euro cents. For 2017, the forecast is as follows: an average electricity price in Germany will amount to 7.8 euro cents per kWh, in Poland to 7.5 euro cents, in Lithuania to 5.8 euro cents [32]. In view of these forecasts, the market situation will be quite favourable for the Russian energy sector.

Secondly, the export of Russian electricity (first of all, from the Baltic NPP) requires the construction of new transmission lines and the enhancement of the existing infrastructure. This task is technologically feasible but will require international financing (perhaps, also from the EU funds).

Thirdly, which is the most difficult task, Russian export plans must be harmonised with the EU electricity plans. The third EU energy package, which came into force on September 3, 2009, is aimed at the diversification of energy sources, thus being not so much an economic, but rather a geopolitical act. At the same time, the EU assumes that it should avoid relations based solely on energy supply and establish contacts covering different areas that are of interest both for the EU and its partners [44, c. 3]. Considering electricity the key component of future Russia — EU energy relations, the

EU insists that such cooperation should not be a "one-way street". EU companies should have an opportunity to export electricity into the CIS energy system. Different companies (including European ones) should have an opportunity to export electricity from Russia to the EU [44, c. 5].

Thus, the prospects of Russian electricity export to the EU (including the EU member states of the Baltic region) largely depend on the general level of Russia — EU relations, rather than on solely economic factors. Today these relations, unfortunately, demonstrate a high level of mutual distrust, which threatens a full-scale implementation of Russia's electricity export projects. A lot will also depend on whether the decision to resume the Visginas NPP project is made or not, and how the European Union and the Baltics solve the problem of energy deficiency in case the NPP is not built.

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