

**“Analysis of the electricity industry development in the Baltic Sea Region:  
markets, grid infrastructure, regulation”  
Saint-Petersburg  
December 12 2014**

**Report by SO UPS, JSC International Relations**

The WS was organized on the basis of the resolution, adopted at the ministerial meeting in Berlin on 14-15 May 2012. The purpose of the WS was to share information and exchange opinions on electrical network development in the Baltic Sea Region, regarding possibilities to enhance cooperation not only within BASREC activities but between companies at the expert level.

The workshop took place in Saint-Petersburg, Russia on December 12, 2014. Representatives of energy companies from 5 countries – Finland, Norway, Denmark, Republic of Belarus and Russia took part in the WS.

Workshop Agenda

*See the WS file*

Participants

*See the WS file*

WS materials

All the materials (presentations) of the WS are available on the BASREC website

**1. Main prerequisites and issued for mutual consideration in the field of markets, grid infrastructure and regulatory framework development in the Baltic Sea Region**

The tendency for electric power production and demand growth, active development of infrastructure, resulted from rapid implementation of renewable generation along with intensive internal energy market and regulatory framework development set challenges to provide sustainable and secure power supply in the Baltic Sea Region and set competitive pricing environment.

In this context analysis of the regional cooperation of the Russian Federation and European Union potential could help to work out the complex, united approach to the

power network development strategy and provide better sustainability of the power systems operation.

Harmonization of the grid infrastructure development scenarios and regulatory framework, use by the Russian and EU power systems for reserves to provide secure supply in the region at emergencies and also possible wholesale markets coupling are regarded as issues of common interest currently being discussed by the electric power industry experts on different professional platforms.

The presented data and initiatives, such as the European 10-Year Network Development Plan (TYNDP), the Plan and Scheme of the Russian United Power System Development or the Roadmap of Russia - EU Cooperation in Energy until 2050 and the environmental requirements in EU and in Russia, emphasized the following major issues for the WS participants consideration:

1. national priorities and strategies for the electricity industry;
2. national scenarios and state-run programs of the grid infrastructure development;
3. prospects and methods of coordination of national scenarios;
4. mechanisms for enhancement of information exchange and regional coordination in order to improve:
  - reliability and security of power supply
  - market coupling;
  - power system planning coordination;
  - grid interconnectors development;
  - support and integration of renewables.

## **2. Review of the Workshop presentations**

### Welcome speech

The WS was opened by Mr. D. Batarin – Director, Communications & International Relations, SO UPS, JSC Russia.

He welcomed the participants of the workshop on behalf of the Ministry of Energy of Russian Federation and SO UPS, JSC and marked the importance of such events as a platform for the professionals in the electric power to exchange information & views on vital issues concerning development and coordination of the infrastructure of the neighboring EU countries – BASREC members and enhance investments in the electrical power industry as well. He also expressed hope that this WS will result in further common experts' activity and helps shift from discussion into practice.

## Presentations

*See the WS files*

### **Mr. Vadim Zakrevsky (Ministry of Energy, Republic of Belarus)**

In his presentation “*Belarus – Baltic States: status and prospects of cooperation in power energy*” Mr. Zakrevsky gave general information on interconnection between Republic of Belarus and Lithuania with total transfer capacity 1100 – 1300 MW Belarus – Lithuania and 1350 – 1750 MW Lithuania – Belarus. Prior the decommissioning of Ignalinskaya NPP Belarus power system adequacy was provided for 50% by import from Lithuania that is 15% of consumption. From 2010 the situation has changed and 50% of demand in Lithuania is provided by import from Belarus what makes the provision of sustainable and secure operation of the Belarus power system of particular importance. Mr. Zakrevsky marked that when planning the Belarusskaya NPP connection scheme they take into consideration prospective desynchronization of the Lithuanian power system from Electrical Ring BRELL by 2020 (according to the Lithuanian Energy Independence Strategy 2020-2050 approved by Seimas). At the same time he expressed concernment in continue interconnected operation with Lithuania via back-to-back connection for example. It was also stressed the necessity to set clear non-discriminated technical and commercial trade rules at the energy markets in the region. In his opinion to intensify the electricity trade and maximize use of the interconnectors capacity in case of constraints occurred in the region it would be good to improve procedure of determination of the available transfer capacity considering the supply from Belarus power system in the Lithuanian zone of the Nord Pool. Mr. Zakrevsky also attracted attention to the necessity to preserve operation in synchronous mode within ER BRELL until signing of the “Agreement between the Russian Federation, the Republic of Belarus and the European Union on Operation of the Unified Power System of the Russian Federation and the Power Systems of the Republic of Belarus, the Republic of Latvia, the Republic of Lithuania and the Republic of Estonia in Synchronous Mode”. Belarus side considers it important for the intensive development of the region to coordinate power systems development scenarios as well as transmission potential of the interconnection Belarus – Lithuania.

**Mr. Oleg Klinkov (Federal Grid Company, Jsc, Russia)**

In his presentation *“Prospects for the Northwest power system development during 2015-2019”* Mr. Klinkov gave general information on the company and network development program and major projects carried out by “FGC UES” Jsc. with the focus on the unified energy system of the Northwest region (UES Northwest). Special attention was paid to the plans of the reconstruction, maintenance and commissioning of the transmission lines and substations in the UES Northwest to provide sustainable and secure supply in the region and Kaliningrad region as well. Mr. Klinkov informed that “FGC UES” Jsc. together with “SO UPS” Jsc. carried out feasibility study to evaluate different scenarios of network infrastructure development under condition of the prospective desynchronization of the Baltic States’ power systems. Experts have worked out a complex of measures for the period 2015 – 2020 to increase the transmission capacity between UES Northwest and UES Center and provide balancing reserves to assure sustainable and secure supply in the region. He also marked the positive tendency in trade development enhancement between Finland and Russian Federation as well as perspective impact on the reliable operation of the systems by implementation of the “Pechenga Energy Bridge” project.

**Mr. Sami Oksanen (Nord Pool Spot, Norway)**

Mr. Oksanen gave presentation *“The latest developments in the Nordic and Baltic Power markets”*. In the view of the results of the previous BASREC WS held in Saint-Petersburg in February 2014 Mr. where participants expressed mutual interest in market regulation rules Oksanen gave detailed information on the Nord Pool Spot responsibilities, markets integration & regulation and Baltic market operation principles. The presentation focused on the principles of the pricing zones formation and gained progress and benefits in this respect. Giving comments to the questions from the representative of the Inter RAO, Jsc. concerning the number of the pricing zones Mr. Oksanen explained that for the Nord Pool Spot it would be desirable not to create new pricing zones not even between countries, for example between Baltic States, thus to get a large market for trading. But Baltic States pricing zones need to be established for the reason of physical congestions and differences in the legislation. Now three Baltic States represent adequate price zones.

Concerning European regulation changes Mr. Oksanen outlined four main principles: publishing inside information, actual generation data, network codes development and Nord Pool Spots market conduct rules. All information accumulated on the NPS website in line with these principles is available to public. As for trade development with Belarus, Russia and Kaliningrad Region it was marked that trade should be realized according to the Agreement between respective TSOs. Nord Pool Spot will implement the platform to trade on it.

**Mr. Andrey Kataev (SO UPS Jsc, Russia)**

Mr. Kataev gave presentation “*Electricity & Capacity Market in Russia*”. In the view of the results of the previous BASREC WS held in Saint-Petersburg in February 2014 where great interest to the electricity & capacity market model was expressed by participants Mr. Kataev offered a comprehensive information on the market organization and regulation in Russian Federation, background of the market formation, wholesale market structure, different payment mechanisms and calculation methods, development of the planning technologies (within BRELL and Russia – Finland). Mr. Kataev presented detailed characteristics, design and main mechanisms of capacity, electricity and ancillary services markets, competitive capacity selection acting model, calculation methods and actions on increasing market efficiency.

Trading with other countries is organized according to the similar principles except Russia – Finland where free trade principles are implemented. Mr. Kataev stressed that there were no any difficulties to harmonize the Russia - Finland power exchange trading rules. Trade is organized via back-to-back setting that facilitates the process in comparison to the Baltic States operating in synchronous mode within Electric Ring BRELL. At present the work on harmonizing regulatory and technological rules of Russia and Baltic States is in progress. For the time being Russia and Baltic States exchange information on the results of the trade on Russian and European power exchanges respectively.

Answering the questions of Mr. Zakrevsky (Ministry of Energy, Belarus) concerning capacity payment mechanisms and their influence on the daily schedules of generation Mr. Kataev said that there are no strong intensives for the customers to shift active consumption from daytime to night-time. They are interested in monitoring the peak hours to escape them. Of course load irregularity is observed but at the same time there

are no sharp shifts of imbalance. Concerning the inefficient generators Mr. Kataev explained that market model is based on the balanced demand-supply. Expensive generators are usually not selected during competitive capacity selection procedure. They should be decommissioned in case more economically effective decisions on their use are not found, for example temporary preservation of the units. This is a new challenge to get solved. There is no general program of taking out of operation of the generating capacity so far and there are no strong intensives for this as well. Generators will find the way to optimize production themselves. Mr. Kristensen (Danish Energy Agency, Denmark) commented that under condition of the big amount of the excess capacity in the power system it would be good to take the opportunity and decommission old polluting generators. Answering the question of Mr. Zorin (“FGC UES” Jsc, Russia) on possibilities to compensate losses to the grid companies by generators when they stop operating without prior warning Mr. Kataev said that it depends on the penalty for the not being ready to operate. Penalty is paid by generators to the consumers and it is the same for any situation. So it is quite possible to use another model and divide the penalty between consumers and grid companies. Mr. Lindroos (ENTSO-E, Fingrid Oyj, Finland) suggested considering of the possibility to export excess capacity from the Northwest region Russia that equals approximately 4,5GW to Finland. Capacity payment in daytime puts the flow in the interconnection Russia – Finland to zero and pool is suffering of that. Mr. Kataev explained that excess capacity is regarded as excessive not from physical but economical point of view, because it is expensive and cannot satisfy market conditions. In general capacity is demanded by different local facilities in the region. But possibility to export excess capacity deserves serious consideration and reviewing of the market rules so it is another perspective direction for joint study.

**Mr. Risto Lindroos (ENTSO-E, Fingrid Oyj, Finland)**

Mr. Lindroos gave presentations “Current state and perspectives of the cross border electric power trade in EU and between Russia and Finland”. First part of the presentation was devoted to development in the electricity sector in Europe – ENTSO-E tasks defined in EU Regulations: Ten-Year Network Development Plans (TYNDP), Adequacy forecasts for the Europe (evaluation of the demand & supply in different regions of Europe), R&D plans for the european market (improvement of the market

mechanisms, transmission grid in Europe), Tools for market Integration (calculation models development), Network Codes Development (regulatory mechanisms). ENTSO-E's main mission is to keep the system security and provide sustainable energy for consumers with a competitive price – key points at the European level for the development.

In his presentation Mr. Lindroos marked that under the condition when EU following its target to eliminate cardinally the CO<sub>2</sub> emission favors development of renewables, TSOs face new challenges i.e. how to keep secure supply when prediction of the capacity has become more difficult and generation more intermittent. Grids and market integration process helps to manage these challenges. Speaking on the markets development Mr. Lindroos emphasized rapid integration of the day-ahead market and progress in intraday market integration process. Market coupling and cross-border trade help to use the cheapest resources available and support the security of supply in European system and result in cheapest prices for the consumers. He also pointed that one of the vital issues for discussion at present is compensation to the generators. Generators complain that there are not enough incentives for them to build new plants and as a result practically all new capacity is subsidized.

Another important issue for the discussion especially under condition of growing intermittent generation and its integration in the net pointed by Mr. Lindroos is the capacity markets development. At present there are several schemes of capacity markets in EU. In this connection the development of the network codes aimed to provide technological and regulatory basis for the markets integration process and infrastructure extension and thus being an effective tool to provide security of supply and reliable system operation.

The second part of the presentation was devoted to status and further perspectives of cross-border electricity trade between Russia and Finland. Mr. Lindroos marked the importance of the signing of the new 2-way trade agreement between Russia and Finland and a few main issues Finland would like to discuss with the Russian partners. They are the following: perspectives to increase the direct trade since it responds better to the market conditions and it makes this model favorable for Fingrid; possibility to increase export from Finland to Russia in summer period since there is a lot of cheap hydro and wind generation at this period; shift from fixed tariffs that finally could kill the trade to more flexible ones. With a small price difference the parties could get

higher benefit. And one more issue worth discussing mentioned by Mr. Lindroos is enhancement of the reserves trade and in this respect consider modernization of the Viborg Substation.

Answering the question concerning the principles applied in EU to provide secure supply and power systems operation under the condition of the intermittent generation rapid growth Mr. Lindroos said that market forces are key factors used for planning operation. TSOs and Regulators try to create favorable conditions for market players so that they could invest in power production and demand/response. Market forces point which plants to invest and how to operate them. Talking about grids he stressed that now TSOs develop common grid models, evaluate needs for new connections/interconnections, follow adequacy analysis results and widen exchange of information on operational issues since there are more and more changes take place in this field.

#### **Mr. Mikhail Starichenko (Inter RAO UES Jsc, Russia)**

Mr. Starichenko gave a presentation “Markets and infrastructure development in BASREC region: state and prospects of cross-border power exchange enlargement”. In the first part of the presentation the emphasis was made on the overview of international power trade provided by Inter RAO UES, its peculiarities and regional specifics. Mr. Starichenko presented different technical solutions for XB trade between Russia and neighboring countries in Baltic region, difference between market models and regulatory rules. Special attention was made to the current state and perspectives of the Russia – Finland and Russia – Norway XB trade as well as to the current state of the synchronous operation within Electrical Ring BRELL. While following discussion Mr. Starichenko marked the existing challenges for the trade development in the Baltic region as necessity to coordinated methods of capacity allocation and congestion management to escape significant difference between prices in the trading zones of Nord Pool Spot coordinate grid infrastructure development in the region with special attention to interconnections, better use of existing XB infrastructure potential.

#### **Mr. Arne Egil Pettersen (ENTSO-E, Statnett SF, Norway)**

Presentation of Mr. Pettersen was devoted to Ten Year Network Development Plan – TYNDP. European network development process is quite challenging process since it



means merging of the five synchronous areas together. To accomplish this quite ambitious task and to make interconnected market operating it is necessary to construct a lot of new interconnections. Most important aspects influencing the network developing marked by Mr. Pettersen are security of supply and observance of requirements set by European Commission towards environmental conditions resulting in commissioning of a lot of renewables and decommissioning of the old polluting generation that means total redoing of the generation park. The goal is rather ambitious since RES generation is much less flexible than traditional generation. These climate and security of support aspects are among main ones for including projects into TYNDP. Mr. Pettersen stopped on common methodology worked out regarding mentioned aspects to reach transparency and consistency in network planning and market integration processes among TSOs. This methodology include four main scenarios for grid development worked out with focus on RES integration, market efficiency and security of supply and also Projects of Common Interests (PCI) established by European Commission.

Network planning is divided between six different regions each of which is publishing own regional plan of the network development. Mr. Pettersen presented main tendencies for the Regional/Nordic Grid Development Plan and important drivers for grid development in this region like increase of consumption in the Arctic, RES integration, North-South flows development, capacity between Nordics and Continental and UK, market integration, interconnection projects, as well as planned investments in the European power system. Answering the questions of the colleagues concerning the reason for cost lowering/increasing when such massive investments are planned into the grid development Mr. Pettersen commented that the figures he presented are for the long-term perspectives and though there is potential for the cost increase owing to the type of generation introduce (RES) has very low almost zero cost for MW per hour. Today in Norway for example it is observed the effect of prices lowering in the market by introducing this type of generation. At the same time RES development is based on subsidies that are planned to be covered by the end consumers according to the cost sharing system introduced in Europe. Concerning the right of the consumers to plug out and use its own generation he answered that in Norway for example to introduce its own generation and connect it to the grid it is necessary to get license which means you are part of the common grid. So it means that even if the consumer has own generation he has no right to plug out.

### **Mr. Anders Højgaard Kristensen (Danish Energy Agency, Denmark)**

Mr. Kristensen gave presentation “Danish Power System: Interconnectors & Wind Integration” where he presented main features of the power system and enhancement of the interconnections caused by intensive development of RES generation and its particular role for Danish power system itself and other systems for which Denmark is a transit country, for example Germany one of the biggest power consumers in Europe. Mr. Kristensen marked that though the initial investments into interconnectors are rather high the final benefit is immense. He gave information concerning the progress of some interconnection projects like Skagerrak to Norway, Cobra to Netherlands, long-term planned connections to Germany and DC links.

Today with the change of the Denmark power landscape to more wind power (high annual level of the wind generation equals 40% and some days it may exceed 100%) the strong interconnectors between neighboring countries are highly used and invaluable since to some extent they can replace power capacity for Denmark. Answering the question on the CHP generation in Denmark its perspectives Mr. Kristensen said that at present this type of generation has been reduced since generation in the neighboring countries (Sweden, Norway) is cheaper and Denmark relies on it and shares reserves. In this context interconnectors help to keep reserves at the lowest price. That is one more reason why the enhancement of the interconnectors is of high importance today.

### **Conclusions**

All the participants recognized the usefulness of such form of interaction since it gives the opportunity to get information from the first hand on the markets regulation rules and grid infrastructure development scenarios.

The BASREC workshop “Analysis of the electricity industry development in the Baltic Sea Region: markets, grid infrastructure, regulation” held on December 12 in Saint-Petersburg, Russia was well organized and gave an impulse to continue cooperation on the expert level to enhance information exchange in the field of the interconnected market operation regulation and power export/import. There was also made a suggestion to launch a study to discuss in details issues like for example distribution of responsibilities within the interconnected market operation processes between national

regulators, power exchanges and system operators as well as the CACM network code implementation process and Baltic Sea network infrastructure optimization to increase export/import and gain maximal economical effect.