BALTSO

Annual Report

2007


Coca-Cola
LATVIJAS KRĀJBANKA

Content

About BALTSO

BALTSO is the cooperation organization of Estonian, Latvian and Lithuanian Transmission System operators.

The Agreement on Foundation of Estonian, Latvian and Lithuanian Transmission System Cooperation Organization BALTSO was signed on 30 March 2006 by the representatives of
OÜ Põhivõrk from Estonia,
Augstsprieguma tīkls AS from Latvia and
Lietuvos Energija AB from Lithuania.

Objectives

- Initiation, development and implementation of conditions necessary for reliable operation and interconnection of the power systems of Estonia, Latvia and Lithuania;
- Handling of means in the area of development of the Baltic transmission system;
- Initiation, development and implementation of conditions necessary for coordinated and safe operation of the electricity markets of Estonia, Latvia and Lithuania;
- Promotion and implementation of cooperation between the Organization and its Members, on the one hand, and energy companies of non-Member countries, on the other hand;
- Arrangement of public relations activities related to the Baltic power systems and electricity markets;
- Initiation, maintenance and development of relations with other relevant organizations and institutions in the Baltic States, in Europe and in the rest of the world.

Governing Bodies of the Organisation

The Leaders' Meeting the Committee and the Secretariat are the governing bodies of the organization.

BALTSO Leaders' Meeting

The Leaders' Meeting is the highest governing body of the organisation and is held annually not later than 30th of June in each member country in rotation, and it passes resolutions and recommendations.

The main functions of the Leaders' Meeting are to approve the annual reports of the organisation and to make decisions on any issues raised by the Committee, the Working Groups or the Secretariat.

Resolutions taken by the Leaders' Meeting are binding, while recommendations are only advisory. For resolutions to be taken, it is necessary for each member to be represented, and each member gets one vote, however many representatives may be in its delegation.

The Committee

The Committee is a collegiate executive body of the organisation and consists of two representatives from each member.

The 2007 Committee members were:
- Vladas Paskevicius and Ramunas Bikulcius from Lietuvos Energija AB;
- Imants Zviedris and Varis Boks from Augstsprieguma tīkls AS;
- Valeri Peterson and Mart Landsberg from OÜ Põhivõrk.

The Committee meets as frequently as practicable in each member country in rotation, and the meetings are convened by the Secretariat. All management representatives need to be present for decisions to make, and in total three Committee Meetings were held during the reporting period (June 2007 until June 2008).

The functions of the Committee are to:

- prepare and draft the annual reports of the organisation;
- prepare and draft resolutions for the Leaders' Meeting and adopt recommendations taken in the meeting;
- establish ad hoc Working Groups to research and analyse specific matters which may arise;
- organise third-party consultants if specialists are required for specific research or other tasks on behalf of BALTSO, the costs being divided equally among the members;
- review and consider reports made by Working Groups.

The 2007 BALTSO had four working groups (WG):

- Operation & Security WG, convener Voldemars Lapinskis from Augstsprieguma tīkls AS;
- Development WG, convener Mart Landsberg from OÜ Põhivõrk;
- Information Technology & Communication, convener Ramunas Maksimovas from Lietuvos Energija AB;
- Wind power development 2010 – 2020, convener Voldemars Lapinskis from Augstsprieguma tīkls AS.

All working groups have had their plans for each reporting period approved by the Committee.

The Secretariat

The Secretariat is a permanent body of the organization, which ensures its day-to-day operations.

The members in rotation perform the functions of the Secretariat so that each member performs the functions of the Secretariat for one reporting period and is responsible for the Secretariat's expenses during that period.

The functions of the Secretariat are to:

- convene the Annual meetings and meetings of the Committee;
- perform secretarial, administrative, record keeping, accounting and other auxiliary clerical functions;
- handle the external communications of the Organisation;
- ensure proper maintenance of the permanent and current archives of the organisation.

In the reporting period Augstsprieguma tīkls AS with Jānis Osītis as secretary and Velga Latkovska as a staff performed the functions of the Secretariat of BALTSO.

Foreword

Year 2007 was a very significant and dynamic for the BALTSO. The Baltic transmission system operators (TSO) not only met the targets set for the year, but also had to adapt their work to the new power system operation status with interconnection to the EU network. Estlink submarine cable is opening the roads towards European energy markets and makes Baltic TSO's fully eligible members of the European TSO companies (ETSO).

With physical interconnection tasks solved Baltic TSO's together with European TSO Companies in the framework of ETSO reached a voluntary agreement on Inter – TSO Compensation (ITC) for transit flows that covers TSO's in all EU member countries and EU perimeter countries.

Opening of the Energy Markets in the Year 2007 started completely new era for the Baltic TSO's with new tasks, possibilities and challenges. In compliance with the EU directives and requirements of the Guidelines on the Development of Electricity Market, the electricity supply sector has to provide non-discriminatory access to the transmission and distribution networks for all market participants at tariffs adopted by the Regulator. The responsibility of transmission system operators is to ensure equal conditions to all the users of the transmission system.

Significant challenge for Baltic TSO's resulted from the Memorandum signed by the prime ministers of the Baltic States in June 2007, which obliges TSO's of the Baltic States until the end of the year 2007 to evaluate possibility for the Baltic power systems to operate synchronously with UCTE via Poland – Lithuania interconnection.

As the first step of the above stated cooperation is the obtained preliminary calculations, conclusions and recommendations concerning investigated scenario of synchronous interconnection. To assess full scale of necessary investments and actions the next study steps are required.

During the year 2007 Augstsprieguma tīkls AS has successfully carried out important functions of BALTSO power system security coordination and prepared the ground for further decentralisation of functions for the future by preparing number of new important operation and cooperation documents. And as the result of above stated the BALTSO parties are actively engaged in the work of Belarus, Russia, Estonia, Latvia and Lithuania TSOs` Committee (called BRELL).

The Baltic TSOs due to their common historical background look forward to continuous close cooperation on the issues of common interest. The security and efficiency of our power networks are the first items on common interest agenda.

I wish to thank my Baltic colleagues for the successful year 2007 and wish all the success in the future!

Imants Zviedris
Chairman of the Executive Board
of Augstsprieguma tīkls AS
BALTSO Secretariat 2007

Report of the BALTSO Committee

Operational and Security Working Group

During the year 2007 WG was involved in development and coordination of agreements, regulations and instructions regulating synchronous operation of power systems of Baltic countries with power systems of Russia and Belarus.

- Following documents were prepared by WG and officially signed by representatives of GPO "Belenergo", OAO "SO EES", OAO "FSK EES", OÜ Põhivõrk, Augstsprieguma tīkls AS and Lietuvos Energija AB;
- Regulations of policies of the power systems of Belarus, Russia, Estonia, Latvia and Lithuania;
- Regulations of the organization of Operative-Dispatch Control of the synchronous operation of IPS* of Belarus, UPS* of Russia, PS* of Estonia, PS of Latvia and PS of Lithuania;
- Instruction of contingency localization and elimination in the electrical ring of Belarus, Russia, Estonia, Latvia and Lithuania power systems (ER BRELL**);
- Regulations on information exchange between dispatch centres within ER BRELL;
- Regalement of development, changing and actualization of calculation model of power systems of ER BRELL;
- General Principles of voltage and reactive power regulation.

Apart from above stated documents, members of WG where working on the whole array of BRELL documents, signing of which are planned during the year 2008.

Interest and attention of the BALTSO WG towards the documents of BRELL is justified because only after coordination of the main questions and principles of co-operation with the power systems of Russia and Belarus it is possible to develop the BALTSO documentation.

In year 2008 WG is planning to develop BALTSO documentation concerning following topics: contingency reserves, power system restoration after black-outs and separation of the power systems of Baltic countries for the island operation.

Development Working Group

BALTSO Development WG Activities at 2007

2007 was a year of challenges. Three new studies were started and one successfully completed - study of Baltic Grid 2025 that focuses on development of Baltic power systems considering different development scenarios, the most likely conditions and stages for the development of power network in the Baltic States up to 2025.

The history of study started in 2003 when a study Baltic Grid 2012 for evaluating power transfer possibilities of three power systems of Estonia, Latvia and Lithuanian in cooperation with UPS and integration to UCTE and NORDEL was launched, which covers the period up to 2012. However, study showed necessity to evaluate the time horizon up to 2025 and therefore a new study Baltic Grid 2025 was launched.

The main goal of the study was evaluation of power transfer possibilities of the three power systems of

* PS – Power System, IPS – Interconnected Power Systems, UPS – Unity of Power Systems.
** ER BRELL – Electric Ring of power systems of Belarus, Russia, Estonia, Latvia and Lithuania.

Estonia, Latvia and Lithuania (Baltic IPS / Baltic) on cooperation with UPS and integration to UCTE and NORDEL for the time period up to year 2025.

One of the studies that launched was named "Wind Generation Development in the Baltic Power Systems". During the BALTSO Committee meeting in Vilnius on 29th may 2007 it was decided that: "Operational WG together with Development WG has to perform analysis of possibilities to develop wind generation power plants in the Baltic States for years 2010 and 2020". That study was completed in the beginning of 2008.

The second study that was launched: "BALTSO – UCTE Synchronous Interconnection Prefeasibility Study with Load-Flow Analysis". The prime ministers of the Baltic states in June 2007 signed the memorandum that obliges TSO's of the Baltic states until the end of the year 2007 to evaluate possibility for the Baltic power systems to operate synchronously with UCTE via Poland – Lithuania interconnection. The cooperation agreement with PSE-Operator SA (Polish TSO) and BALTSO TSO's was signed and working group was established. The purpose of the study was to determine the technical conditions of the network under which the BALTSO power systems might be synchronized with the UCTE power system. The prefeasibility study was completed in the beginning
of 2008.

At the end of 2007 new study between Baltic TSOs (UPS/IPS), Nordic TSOs (Nordel) and Polish TSO (UCTE) was launched to develop coordinated extension plan of interconnections from Baltic to Nordel area and Poland to satisfy transmission needs between areas. The objective is to accomplish an optimum playing field for the single electricity market of the future. Study will be completed by the end of 2008.

Information Technology & Communication Working Group

Activities on the agreed plan for the ITT WG for year 2007 were not completed due to the severe workloads of the Working Group members. Members of the ITT WG were involved in the following IT projects in their individual Power Companies:

Lietuvos Energija AB

Activities on the upgrading of the SCADA system, implementation of the Automatic Generation Control within the SCADA system and activities associated with design and construction of the new 330 kV and 110 kV sub-stations.

Latvenergo AS

Upgrading of the planning software and tools, restructuring of the archiving system due to entering into liberalized energy market, work on the input data redundancy for the SCADA system and development of the new Concept of the Dispatch Control.

OÜ Põhivõrk

Activities on the SCADA system upgrade were carried out and switching to the new SCADA version performed during the 4-th quarter of the year 2007.

Wind Power Development 2010 – 2020

According to EU Directive 2001/77/EC, Member States shall take appropriate steps to encourage greater consumption of electricity produced from renewable energy sources (RES-E). BALTSO supports sustainable development of renewable generation sources that not affect reliability and safety of power grids. Three Baltic TSOs: OÜ Põhivõrk, Augstprieguma tīkls AS and Lietuvos Energija AB within framework of the BALSTO created task force to prepare report that includes analysis of present situation and guidelines for the future actions related to wind power development.

The main findings of the WG are :

- Taking into account uncertain nature of wind availability Baltic TSO's should have at their disposal additional balancing ability and fast acting regulating generation reserves. The amount of reserve is recommended to be around 50 % from installed capacity of wind power plants;
- The major limiting factor is that each TSO according directive 2003/54/EC article 9.c should have own technical ability to balance own power system;
- In order to enhance the regulation of wind power capacity, it is recommended that operators of wind power plants provide (or TSOs to prepare) planned generation schedules at least 48 hours in advance;
- In Latvia and Estonia (from 2009) wind power plants are balance-responsible, while in Lithuania they are not. Introduction of similar principles and requirements could be analysed further by TSOs.

Acceptable level of wind generation penetration in each country is:

Estonia

Maximum wind capacity connected to TSO will be in 2010 250 MW, in 2015 450 MW and in 2020 750 MW.

Latvia

At present without new manoeuvrable generating capacity in Latvia it is possible to install no more than 210 MW of wind generation. Considering possibility to restrain wind generation it is possible to have in Latvia 550 MW of installed wind generation by 2020.

Lithuania

Preliminary wind generation development in Lithuania for the next decade (2011 – 2020) could be in the range of 300 MW. Total installed wind generation capacity could reach a level of 500 MW in 2020.

Future tasks of WG

Next task for the working group is harmonization of technical requirements for the wind farm connection in the Baltic States.

Electricity market

Estonian Electricity Market

The market structure has similarities to Scandinavian model with the System responsibility given to the transmission system operator (TSO). All market participants have to have an open delivery contract and balance providers need a balance agreement with system operator. There are three balance providers active in Estonia currently. The trading in the market is carried out by bilateral contracts, not via spot-market.

Customers with consumption over 40 GWh per year become eligible customers. Only eligible customers have a right to choose a supplier. They have also right to apply for an import license, which is issued by the Electricity Market Regulator. There are 13 eligible costumers in Estonia and their share is about 16,5 % of consumed energy in 2007.

No-one of customers uses today the rights of eligible customer. Starting from January 2009 35% of market must be opened. The opening of market is planned to be completed to the full extent by the year 2013.

Non-eligible customers can purchase their electricity from the grid company they are physically connected to or from the seller named by that grid company.

Grid companies and sellers selling energy to non-eligible customers can purchase that energy from oil-shale based power plants which install capacity exceed 500 MW or from small producers with capacities less than 10 MW.

Electricity Transmission and Distribution

Pursuant to the Electricity Market Act, Estonia may have only one transmission system operator. The Energy Market Inspectorate issued the corresponding license to OÜ Põhivõrk which is a national grid company in the electricity market. The main functions of TSO are as follows:

- bulk electricity transmitting at voltages of 6 – 330 kV to distribution networks, large consumers as well as neighbouring power systems;
- developing, operating and maintaining a 110 – 330 kV electrical network, covering geographically all of Estonia;
- ensuring the reliability of Estonia's power system operation in cooperation with neighbouring power systems;
- ensuring the Estonian energy balance and operating the balance settlement for the balance providers.

OÜ Põhivõrk, initially one division within Eesti Energia AS, had its inception in the 1998 decision of Eesti Energia AS to merge five regional electricity networks and from them form two structural units – Põhivõrk, responsible for transmission and Jaotusvõrk, responsible for distribution. Põhivõrk started operating electrical devices at a voltage of 110 – 330 kV (including 110 kV transformers). With the creation of a new structural unit, the Põhivõrk also became responsible for the accounting of its economic activities and auditing the records.

Acting in accordance with requirements of Electricity Market Act, which came into force in 2003, and which separate network operators from activities in the field of electricity production, distribution and sales, Eesti Energia AS formed OÜ Põhivõrk based on the existing structural division. The task of electricity distribution is to transport electricity from the nearest transmission grid connection to consumers by using an electrical network at a voltage level of 0.4 – 35 kV, known as the distribution network, and then decreasing the voltage to a level suitable for consumers.

This is handled by distribution network companies, of which there are 41 in Estonia. The largest are OÜ Jaotusvõrk, OÜ VKG Elektrivõrgud and Fortum Elekter AS. Suppliers buy electricity from producers, and the electricity transport service (the network service) from distribution networks.

They form suitable price packages for end consumers, selling electricity and network service together. A handful of large consumers prefer to buy electricity and network services directly from producers and electricity networks. The largest electricity supplier in Estonia is Eesti Energia AS.

The network operator charges a fee for:

- enabling the network connection;
- transmitting electrical power.

As a consequence of changes in the Electricity Market Act, the new price list for OÜ Põhivõrk network fees came into effect on 1 May 2007.

The aim in changing the price list is to separate the cost of financing the support and the purchase obligation of renewable electricity, as laid out in the Electricity Market Act, from network fees. As a result, the network charges have fallen by 7% on average, but the financing for the support and the purchase obligation of renewable electricity is added to the network service charges. Those costs are published on the homepage of OÜ Põhivõrk http://www.pohivork.ee/index.php?id=519

The price list is confirmed by decision No 60-004/07E from 29.03.2007 of the Energy Markets Inspectorate.

Table 1. Price list of network services before and after 01.03.2008

Name of the service	time	Network charge		Unit
		2007/08	2008/09	
Transmission at the voltage of 330 kV		1,37	3,01	€/MWh
Transmission at the voltage of 110 kV	Peak*	1,44	9,56	€/MWh
	Low**		4,78	
Transmission for the low-voltage side of a 110 kV transformer	Peak*	2,79	10,72	€/MWh
	Low**		5,36	
Use of network connection at the voltage of 110 kV		23,66	–	€/kW per year
Use of network connection of the low-voltage side of the 110 kV transformer		27,66	–	€/kW per year
Consumption of reactive power from 6 – 110 kV devices		1,07	1,09	€/Mvarh
Supply of reactive power into the network via the 6 – 110 kV equipment		1,07	1,09	€/Mvarh

* peak time: period from 1st of October until 31st of March, times 7:00 – 23:00
** low time: times except peak time

Electricity Market in Latvia

The electricity market in Latvia is completely open because there are no restrictions for any electricity trading company to enter the market and to offer electricity for a lower price and also electricity consumers can freely change their electricity supplier. There are also no restrictions or tariffs for electricity import and export.

Due to unbundling of the electricity market, reorganization of Latvenergo AS was completed and subsidiary companies were established – distribution system operator Sadales tīkls AS and transmission system operator Augstsprieguma tīkls AS (according to the European Union directive 2003/54/EK), thus guaranteeing access of third persons (new electricity suppliers) to transmission and distribution networks.

The Electricity Market Law came in to force in 2005 and it defines the role of public supplier which currently is Latvenergo AS Main responsibilities of the public supplier are electricity supply to all non-eligible users, purchase of electricity generated by using renewable energy sources and to be the last garanteed supplier.

Since 1-st of July 2004 all non-domestic consumers are allowed to change electricity supplier, but the first real change of supplier was made only on 1 July 2007. Most active company in the Latvian market of electricity is a subsidiary of Estonian energy company Eesti

Energia AS which started supply of electricity for its first customer on 1 July 2007. By 1-st of March 2008 Public Utilities Commission (PUC) has issued 17 electricity trading licenses.

At the moment electricity consumers are not interested in change of supplier because tariffs approved by PUC are still very beneficial to consumers and it is difficult for new suppliers to compete with tariff prices. On 1 July 2007 electricity market was opened also for households which means all electricity consumers in Latvia are allowed to change electricity supplier.

By 1 March 2008 five consumers have changed electricity supplier and left the public supplier. Services of electricity transmission and distribution are still offered to those customers and all others by tariffs which are approved by PUC and all customers are also paying the mandatory procurement component, which occurs when the public supplier purchases the electricity from supported producers.

It is expected that in the future electricity consumers will benefit from the market unbundling because of a bigger competition between the suppliers with subsequent price decrease.

Market of electricity in Latvia is regulated by: The Electricity Market Law, The Energy Law and Regulations of Electricity Usage issued by the Cabinet of Ministers of Latvia.

Tariff for the service

Type of tariff	Network charge	110kv line	10kv substation	Distribution network
energy	EUR/MWh	2.057	2.357	2.714
capacity	EUR/kW/Year	5.839	7.246	7.66

Situation on the Market of Electric energy in Lithuania

The market of electric energy started practically operating in 2002, when part of consumers acquired the status of eligible consumers on the basis of the adopted Law on Electricity. The status of an eligible consumer presupposes the right to a free choice of suppliers.

The new edition of the Law on Electricity came into force on 1 June 2004. In its essence, the Law has been fully adapted to requirements of the European Union directives on electric energy.

The electric energy market may be conditionally divided into two parts:
- retail trade market;
- wholesale trade market.

The level of liberalisation of retail trade market is defined by the Law on Electricity, while the level of liberalisation of wholesale trade market is defined by electricity trade regulations adopted by the Ministry of Economy.

On 1 July 2004, the law defined all non-domestic consumers as eligible consumers entitled to freely choose the supplier. Therefore, the level of liberalisation of retail trade market may be estimated at 70 per cent of the total consumption in the country.

Since 1 June 2007, all consumers have had the status of eligible consumers. Virtually, all consumers whose equipment is connected directly to transmission network have executed their right of choice of the supplier. These are Lithuania's five major industrial companies. Three more enterprises, with the status of regional operators of distribution networks, are also active market players as far as consumption is concerned.

As of the beginning of 2003, all suppliers are entitled to conclude a direct contract for electric energy supply with the producers for the volume not exceeding 70 per cent of the total consumption by the supplier's clients in accordance with electricity trade regulations applicable to wholesale trade market. The remaining volume is purchased by suppliers from Lietuvos Energija AB. Volumes, purchased from Lietuvos Energija AB, are divided into two parts:
- electric energy sold under the public service obligations;
- additional electric energy sold to ensure hourly balance of production and consumption.

Electric energy sold under public service obligations is electric energy purchased from power plants operating on renewable energy resources (water, sun, wind, etc.), energy produced by cogeneration plants (co-production of heating for municipal needs and electric energy), electric energy produced by the power plants which is the main reserve for Ignalina Nuclear Power Plant, etc. The total volume of this type of electric energy amounted to 20.02 per cent in 2007. The sales price for suppliers of this type of energy is calculated for every year as

weighted average price of purchase from the producers and is approved by a resolution of the regulator (The national Control Commission for Prices and Energy).

Additional electric energy is the aggregate of all other types of electric energy (regulating, balancing, purchased at an hourly auction of producers, importers and exporters). The price of this type of energy for suppliers changes on a monthly basis subject to real costs of purchase. Purchases at an hourly auction are executed on a competitive basis between the producers, exporters and importers. Therefore, one may draw a conclusion that the level of liberalisation of the wholesale electric energy trade market makes 79.98 (70+9.98) per cent of the total consumption.

On the wholesale electric energy trade market, producers, exporters and importers trade in electric energy, the volume of which is estimated for each hour and is fixed by hourly metering devices.

On the wholesale electric energy trade market, the suppliers trade in electric energy, the volume of which is estimated for a calendar month and is fixed by hourly metering devices, summing data for a month. Trading is done in advance. The final deadline for tenders is 2 p.m. of the day preceding the operational day (the day of factual production and consumption). Upon expiration of the deadline for tenders, the market participants (producers, exporters and importers) are entitled to apply for sales/purchase of regulated electric energy (if it is necessary to change the working mode for securing of balance of the power system). Applications for regulation energy are sorted according to prices. This ensures priority for market participants who proposed the lowest prices for regulation to be used in the first place, should it be necessary for the securing of balance of the power system in the operational hour.

Presently, 8 power plants and 8 suppliers, exclusive of Lietuvos Energija AB and system operators of other power systems, are active participants on the wholesale market of electric energy.

After the new edition of the Law on Electricity came into force, premises for the increase in the level of market liberalisation with attraction of market participants from other countries to trade on Lithuania's market were made.

In the course of 2003 – 2007, Lietuvos Energija AB invested into software projects for implementation of hourly electronic tenders between market participants by means of personal computers at a work place of the market participant. This project is at the stage of completion and we hope to commence real tenders in 2009, since upon the project completion, it is necessary to organise training of users of this tender system.

Consumers and distribution networks, who are users of electric energy transmission services, pay the system operator for the service of reservation and services of electric energy transmission on the same basis. The service of reservation means costs of the system operator incurred for maintaining of necessary power reserve. Power reserve is at the disposal of power plants and/or operators of the neighbouring power system. Capacity charge amounts to 2.007 EUR/kW.

Tariff for the service of the transmission network is divided into two components:
- capacity component – 1.755 EUR/kW;
- energy component – 3.62 EUR/MWh.

The amount payable for reserve and power is estimated as multiplication of average hourly power of an hour of maximal use per month by a corresponding tariff.

The amount payable for electric energy is estimated as multiplication of quantity of electric energy consumed per month by a corresponding tariff.

Energy Policy

Objectives of Estonian Electricity Sector Development

The strategic objective of Estonian electricity sector development plan until 2015 is to assure the optimal functioning and development of Estonian power system in the market economy conditions and to assure in the long-term outlook the proper supply of electricity to the consumers at lowest price possible, at the same time implementing all reliability and environmental conditions.

On the assumption of the criticality of strategic purpose we have to observe the following very important purposes on the development of Estonian electricity sector:

- Ensure the reliability of Estonian power system and security of supply Estonian consumers;
- Ensure the availability of local generative power to cover the internal electricity power consumption;
- To develop technologies for effective use of energy resources, including combined heat and electricity production technologies;
- Support the increase of effectiveness of electricity production from oil-shale as from local primary goods in the open market economy conditions and preservation the competitiveness of domestic market;
- Stimulate the saving power consumption;
- Create and operate effectively new interconnections capacities with EU power systems for increasing the reliability and for energy trade developing;
- Ensure availability of know-how in energy sector, efficient development and transfer of technology, research and innovation in Estonia.

Conditions to Consider the Electricity Sector Development

Implementing the strategic objective and other objectives and guiding electricity sector development we have to regard and implement also the other entered domestic or/and international level engagements and also the different level rights which have an affect to the electricity sector. Mainly they are the EU engagements to implement the internal market, competitiveness and environmental rules. Nevertheless the mentioned rules are important also on the level of Estonian domestic market. After that is important to take into account and treat the regional, economical and social needs to avoid the problems somewhere else.

On developing electricity sector we have to consider following already applied and to become effective up to 2015 the main restrictions and entered engagements:

- To assure implementing of governmental established environment requirements;
- To achieve percentage of electricity production from renewable energy resources 5,1 % of gross-consumption in 2010;
- To achieve percentage of electricity production from electricity and heat co-generation 20 % of gross-consumption in 2020;
- To open Estonian electricity market for 35 % in 2009 and for all consumers in 2013;
- To keep the consumption of primary energy resources on the level of 2003;
- To take into account the influence of the program to decrease the volume of green house gases.

Latvian Government Policy of Energy Sector

Taking into account the Guidelines for the Development of Energy Sector 2007 – 2016, issued in 2006, Latvian Cabinet of Ministers at the beginning of 2007 obliged the Ministry of Economics to assess the necessity of the development of base load generating capacity.

Working Group was established and tasked to report to the Cabinet of Ministers on „Introduction of the new base generating capacities". In addition to that on July 24, 2007 the Cabinet of Ministers approved the regulations No. 503 Regulations on electrical power generation from renewable energy sources, issued in compliance with paragraph 29 of Electricity Market Law.

Above stated Working Group of Ministry of Economics developed the report based on annual report of the Latvian Transmission System Operator (TSO) Augstsprieguma tīkls AS submitted on 30 of November in which TSO warned about expected energy dependency because of the deficit in power production capacities in Latvia thus diminishing the security of power supply, especially after the closure of the Ignalina NPP. The TSO report emphasized on continuing electricity demand increase trend in the country of about 3.5 % per year and informed that 50,8% of the electricity consumed in the country during 2007 has been imported.

TSO informed that situation will be escalated by the planned closure of the Ignalina nuclear power plant at the end of 2009, since then demand for the energy produced in Russia will increase in the region. Taking into account limitations in the transmission networks outside Latvia most of the power imports from Russia will be non-guaranteed. Report also explains necessity to take into account planned development of the wind power generation in Latvia. Operation of the wind power generation is characterized by the frequent changes in the generation pattern, which has to be compensated for. Current structure of the power plants in Latvia can compensate up to 210 MW of the total wind power generation capacity in Latvia. In case the additional wind power generation will be developed it will be necessary to construct respective manoeuvrable conventional generation capacities.

In the document developed by the WG of the Ministry of Economics it is advised to adhere to the conclusions from the TSO report stating that in Latvia from year 2012 deficit of generating capacity of 300 – 500 MW is expected. WG specified that „Guidelines for the Development of Energy Sector for 2007 – 2016" binds that local generation level of 80% from demand has to be achieved in the Latvian power system by the year 2012, and 100% shouldbe reached by the year 2016. It has to be managed by maximizing the utilization of the renewable energy resources and co-generation power plants, but the rest of the deficit (400 MW and 800 MW till the year 2015 and 2020 respectively) should be covered by construction and commissioning of the new power plants: – the natural gas burning combined cycle power plant before 2015 and fossil fuel burning power plantafter 2015. The reason for this is not only provision of security of supply but diversification of fuel types used for power production.

Taking into account that TSO annual report presents clear and convincing information on the expected power deficits until 2016, WG recommends the Ministry of Economy to perform immediate actions to determine and to provide tender procedures for development of new base load power plants.

The above stated reports will be evaluated by the Cabinet of Ministers of Latvia at the beginning of 2008 and the respective decisions will be taken in order to fulfil the „Guidelines for the Development of Energy balance of Latvia for the year 2007 – 2016".

The Lithuanian State Policy in the Energy Sector

The National Energy Strategy (Approved by Resolution No X-1046 of the Seimas of the Republic of Lithuania of 18 January 2007) defines the main targets set by the State and directions for their implementation until 2025 by fully adjusting these targets and directions to growing state needs and the most recent international requirements, having regard to the aspects of efficiency, energy security, environmental and management improvement. The following provisions for the development of Lithuania's energy sector are important:

1) to pay particular attention to the countries and regions largely isolated from the EU energy market;
2) to charge the European Commission with developing a priority Interconnection Plan and facilitating the realisation of priority infrastructure projects;
3) to speed up diversification of supply of energy resources;
4) to present a Strategic EU Energy Review on a regular basis;
5) to draft proposals regarding a common EU energy strategy, in particular maintaining a dialogue with Russia;
6) to aim at making the EU-Russia dialogue more effective and transparent and at the ratification, by Russia, of the Energy Charter Treaty of 17 December 1994 and the conclusion of the Energy Charter's Transit Protocol.

The main functions of the State and directions of actions which would assist in implementing the desired development of the energy sector are as follows:

- to implement a complex and sustainable domestic policy of the country, taking account of the key provisions of EU energy policy and prevailing global energy development trends;
- to take active part in the development of an efficient EU energy policy and in the drafting of EU energy legislation;
- to efficiently and transparently use EU structural assistance;
- to provide for the most efficient ways and means of implementing the energy policy;
- to politically and legally support investments into the construction of a new nuclear power plant and construction of a long-term storage facility for spent nuclear fuel;
- to develop the strategic partnership of Lithuania and the Baltic States and Poland as well as a closer co-operation in all energy sectors;
- to develop partnership in the energy sector with Scandinavian countries as well as to participate in EU-Russia strategic partnership;
- to strengthen the institutions of energy management and regulation.

In compliance with the requirements for and provisions of Europe's sustainable, competitive and secure energy as formulated in Lithuania's Treaty of Accession (Valstybės žinios, No 1-1, 2004), the Energy Charter Treaty of 17 December 1994, EU legal acts and the Green Paper, the following strategic objectives of Lithuania's energy sector, which are common to all EU states, shall be set:

- energy security;
- sustainable development of the energy sector;
- competitiveness;
- efficient use of energy.

Seeking the common strategic objectives of the energy sector and substantial strengthening of Lithuania's energy security, the following development objectives of the national energy sector shall be set:

- to seek comprehensive integration of Lithuania's energy systems, especially the electricity and gas supply sectors, into EU systems and the EU energy market;
- to diversify the sources of primary energy by reviving nuclear energy and to rapidly increase the relative weight of renewable and indigenous energy resources, to ensure that the share of the natural gas supplied from a single country and used for the generation of energy would not exceed 30% in Lithuania's annual fuel balance;
- to improve the efficiency of energy use and to save energy consumption.

Seeking to implement strategic and development objectives as well as assessing results of implementation of the goals as formulated in previous (1994, 1999 and 2002) strategies, the following main tasks shall be set:

- to complete implementation of the requirements of EU directives with regards to liberalisation of the electricity and gas sectors, taking account of the national interests of energy security;
- to ensure the continuity and development of safe nuclear energy; to put into the operation of a new regional nuclear power plant not later than by 2015 in order to satisfy the needs of the Baltic countries and the region;
- to implement EU environmental requirements in the energy sector;
- by 2010, to accumulate and continuously maintain the stocks of petroleum products and oil equalling 90 days' consumption; by 2013, to develop natural gas storage capacities and maintain the gas stocks equalling up to 60 days' consumption;
- to renovate the power plants, power and natural gas transmission and distribution systems as well as we district heating systems which are physically and morally worn, while increasing their efficiency and reliability;
- not later than by 2012, to connect Lithuania's high tension electricity networks with the networks of Scandinavian countries and Poland;
- to further develop regional co-operation and collaboration seeking to integrate the Baltic States' electricity market into markets of the EU states, while providing conditions for the efficient use of design output of the Kruonis HPSP;
- to construct a natural gas storage facility in Lithuania, develop a common regional natural gas storage facility that would be in line with the interests of strengthening of Lithuania's energy security as well as construct, upon preparing a feasibility study of Lithuania, Poland and Latvia and taking account of the interests of Lithuania's energy security, a common liquefied gas import terminal in the Baltic region ensuring the promotion of liberalisation of the gas sector by means of these projects;
- to increase the share of renewable energy resources in the national balance of primary energy at least up to 20% by 2025;
- to increase the share of the electricity generated by combined heat and power plants during the heating period in the national balance of electricity generation up to 35% in 2025;
- to increase the share of bio-fuels in the country's market of the fuel used in transportation up to 15% in 2020 and up to 20% in 2025;
- as of 1 January 2008, to save 9% of final energy over the period of 9 years;
- to further improve the efficiency of consumption of all types of energy;
- to improve energy sector management;
- to maintain and strengthen the scientific research institutions training energy specialists and working in the energy field;
- to ensure that the management scheme and operators of new energy infrastructure facilities comply with EU competition criteria and that these operators act as neutral market participants; to seek their free and unhindered access to EU energy networks.

System operation

Dispatch Control within BALTSO

During the year 2007 dispatch control of the transmission networks in the Baltic countries was realized from three dispatch centers:

- OÜ Põhivõrk (Estonia);
- Augstprieguma tīkls AS (Latvia);
- Lietuvos Energija AB (Lithuania).

Until the signing of new documents, regulating TSO's cooperation in new environment of cooperation, the AS Augstprieguma tīkls (Latvia) was undertaking to carry out the below mentioned coordination functions for purposes of the operative coordination of the Estonian, Latvian and Lithuanian TSO's with the Power systems of Russia and Belarus:

- Real time power system monitoring;
- Readiness to perform power system restoration after wide spread disturbances;
- Interchange security assessment of the BRELL transmission system network for the next day/ month;
- Coordination of the monthly OHL maintenance schedules;
- Baltic power system interchange balance settlement;
- Calculations and reporting on the transited energy through the Baltic power systems` networks;
- Calculations of the common disturbance generation reserves and reports on their realisation.

For the future these functions are planned to be split among Baltic TSO's.

Security of Transmission Network Operation

System safety and quality of electricity is the primary goal of operation of the interconnected transmission network. The Baltic States operates synchronously with the power systems of Russia and Belarus. The large scale nuclear units with a significant capacity of 1000 and 1500MW on the one hand and a great responsibility to provide a reliable and efficient operation of the transmission system on the other hand imposes the operators to use different emergency automatics. To prevent the operation of the load shedding devices, first of all the automatic start up of selected reserve hydro power units or automatic thermal power plants` load reduction is designed. This means that power system security criterion N – 1 in cases of particularly severe disturbances is provided by special emergency protection systems, which comprise the devices in several power systems e.g. starting up the hydro generators of Daugava Cascade and Kruonio HPSPP from outage signals of Ignalina nuclear power plant or 330kV overhead lines.

The most significant bottleneck in the region actually is outside the Baltic States and it is the boundary between Russia and Belarus. In case of emergency in this section, the most negative consequences are possible: instability of the system operation, a long shortage electricity supply, failure of the electrical equipment and low quality (frequency, voltage) of the supplied power. The most significant loading of this section that is crucial for operation will be after closure of Ignalina NPP in 2010.

In order to prevent asynchronous operation of different parts of interconnected power systems in case of emergency, the protections devices called ALAR are installed to detect asynchronous operation over selected lines and to separate network parts.

In the case of significant frequency or voltage deviation, the quick emergency disconnection of the selected load is performed by respective load shedding automatics that are intended to maintain acceptable frequency level (49.2 – 49.8 Hz) in the power systems.

The transmission grid in the Baltic countries

In the Baltic power systems the total amount of the load connected to these automatics is approximately 50% of the peak load. However, the emergency disconnection of the load is performed by stages with different frequency and time settings for each stage.

In order to stabilize frequency the hydro generator start-up and stop is used in addition to the load shedding automatics.

In number of cases the emergency automatics are considered as the last means to avoid power system blackout, and its working conditions should not occur under normal operation or rated N –1 outages (except the loss of generator or block in IAES). However, with the constant load growth and foreseen generation deficit in the Baltic region, the importance of emergency automatics should not be underestimated.

Operation in synchronously interconnected network allows generators of the Baltic power system to operate with primary control using dead band of 0.1 – 0.25 Hz and droop of 2 – 7%, while centralized frequency control is performed by central controller on UPS of EES Russia hydro power plants on the Volga river.

The relay protection in the Baltic power systems is comprised of variety of applications of relay protection devices and in functioning methods of the different kinds of relay protection (remote backup protection, tele-acceleration principles of the distance protection and zero sequence current protection, etc.). This provides the high level of reliability, selectivity and operational speed of the relay protection devices.

Development

Estonia

Current Situation

The transmission system operator of the Estonian power system owns network containing 110, 220 and 330 kV lines and substations and most of the 110 kV power transformers. There are currently 144 110-220-330 kV substations in Estonia, 10 of which are 330 kV substations. The total length of 110-330 kV power lines is 5212 km. However, according to the new Grid Code, new grid connections with OÜ Põhivõrk can be done only on the voltage of 110 or 330 kV. Estonian TSO also owns six 35 kV sea-cables between mainland and major islands.

The Estonian 330 kV network is relatively powerful and allows to import or export of 400-1400 MW power depending on loop-flows in interconnected power system.

With neighbouring countries the Estonian power system is interconnected with five 330 kV transmission lines. With Latvia, Estonia has two 330 kV lines – one from Tartu, another from Tsirguliina substation. With Russia, Estonia has three 330 kV interconnection lines – one from Balti PP, second from Eesti PP and third from Tartu SS. From year 2006 the Estonian network is connected to Finland network via 350 MW DC submarine cable (Estlink).

This DC connection with Finland is based on new high-voltage transistor technology, which is at the moment the biggest connection of this type. Due to modern technology this connection allows additionally to energy transmission:

- control active and reactive power;
- control the voltage of power system both in normal and emergency cases;
- control the frequency of power system both in normal and emergency cases;
- in case of blackouts to restart the power system;
- to stabilize Estonian power system in case of emergency.

Transmission System Development Plans

Interconnections

In interstate connections it is planned to create third connection between Estonia and Latvia. Final investment decision for this connection has not made, at the moment the economic and technical study and line route selection are in progress. The earliest possible completion date is in 2020, considering time for analysis, line right-of-way coordination and building.

For 2012 it is planned the second connection between Estonia and Finland – Estlink-2 (from Püssi SS to Finland with capacity up to 800 MW), which as a result increases the reliability of Estonian power system and decreases Estonian and whole power system's of Baltic countries dependency on Russian power system. In emergency situations it is possible to import power from Nordic countries and increasing the interconnection capacity in the future stabilizes energy prices in the market. At the moment the Estlink-2 right-of-way selection in Estonian side is in progress. The arrangement for selection the right-of-way for new HVDC submarine cable is started as well.

Internal Grid

According to Estonian grid development plan, it is efficient to establish 330 kV connections between Tartu-Viljandi – Sindi – Harku (Figure 6.2.1). The new 330 kV transmission lines in Tartu – Viljandi – Sindi – Harku will enhance the connections between north and south 330 kV networks and provide better reliability in Tallinn and Pärnu region. Additionally, the new transmission lines provide better opportunities for connecting new wind

parks to national grid and will help guarantee capacity of the possible new Estonian – Latvian connection. The connection will be built in next sections:

- Tartu – Viljandi section for 2012;
- Viljandi – Sindi section for 2014;
- Sindi – Harku section depends on establishing new power plants to Pärnu and Tallinn and the second Estonia – Finland connection (roughly after year 2020).

To provide connection for the new power plants in Tallinn region and to ease import restrictions from Finland through the Estlink 1, the additional 330 kV connection between Kiisa and Aruküla must be established. The feasibility studies for that connection are in progress.

According to development plans for year 2025, the majority of existing 330 kV lines must (after depletion of technical resources) be renovated up to bigger cross-section (3 x 400 mm^2), which guarantees considerably higher transmission capacity.

At the moment the analysis of planned Tartu – Viljandi – Sindi 330 kV line course is started. In the beginning of 2007 the report of environmental influences was completed, which in May 2007 was accepted by Environmental Ministry. At the moment the conclusion of notarial contracts with land-owners is in progress. The compilation of the technical project begins this year.

New Power Plants

In Estonia there are two CHP-s (2x25 MW) under construction, one in Iru (near to Tallinn) and the second in Tartu. It is planned to commission those two CHP-s in 2008/2009. In addition, a number of new wind parks are planned and few are already under construction. Currently, 103 MW of wind parks are under construction.

Estonian TSO OÜ Põhivõrk considers also the building of the additional gas turbine plant (capacity circa 100 MW) for year 2011, to use it in case of covering the emergency reserves in possible emergency cases. Taking into account the increasing installed capacity of wind parksand peak load, it is planned to construct additional regulating reserve gas turbine power plant with capacity of 300 MW by 2018.

Two new generation units will be built in Narva power plant, both with capacity up to 400 MW (in years between 2016 and 2020). Also to the four existing generating units the flue gas cleaning devices (deSOx and deNOx) will be installed, which allows to use these units also after 2015. In case of this scenario in Narva power plants, it is possible to use circa 1800 MW of generation capacity after 2015. At the moment in Narva power plants the environmental impact study for construction of additional generation units, is compiled.

Latvia

Transmission Network Development

In November 2007 a new 330 kV substation of Riga CHP-2 with 250MVA transformer and two 330kV transmission lines to Salaspils and to Riga CHP-1was commissioned in order to connect new CCGT 400MW unit.

Augstsprieguma tīkls AS continues the reconstruction of 330 kV substation in Aizkraukle for Plavinas HPP.

Generation Development

On 1st August 2006 Latvian government has approved the Guidelines on Development of Energy Sector for the period 2007 – 2016. The main targets for the electricity sector is to reach the self sufficiency of Latvian power system of 80% by 2012 and 100% by 2016, as well as the share of renewable energy sources (RES) of 49.3% by 2010. The Climate Package proposed by the European Commission will certainly create new challenges in reduction of greenhouse gas emissions and wider use of RES. This shall determine the future development of generation capacities in Latvia.

New gas-fired combined cycle (CCGT) CHP plants: Riga CHP-1 (144 MWel) and Imanta CHP (47 MWel) were commissioned during the period of 2005 – 2006. Larger 400 MW CCGT unit (unit No. 1) is under construction in Riga CHP-2 with scheduled inauguration on June 2008. It shall replace one existing 110 MW unit of Riga CHP-2.

Modernisation of the hydro aggregates (replacement of turbine, generator and control system) No. 4, 5 and 7 of Plavinas HPP is under way and to be completed by 2010. Similar modernisation is planned in Kegums HPP-2 and Riga HPP during the period 2010 – 2020.

Recently, the tender for designing and construction of Ventspils CHP (co-financed by European Union Cohesion fund) was announced by the Ministry of Environment. SIA Ventspils Energo, the project owner, is planning to launch the new 20 MW coal and biomass CFB power plant by 2012.

Recently, the tender for the State support on development of approximately 160 MW of wind capacity was announced by the Ministry of Economy. The results of the tender are expected in January 2009. The government's target is also to increase the capacity of biogas power plants by 20 MW and biomass power plants by 50 MW at the end of 2010. However, there are no indications that this target would be reached.

The Report of the Ministry of Economy on development of the base load generation capacities in Latvia calls for initiation of construction of 400 MW gas-fired CCGT unit of Riga CHP-2 (unit Nr. 2) and 400 MW coal-fired power plant (so called Kurzeme power plant) in the city of Liepaja or Ventspils. Both projects shall be completed by 2016 in order to cover the possible generation capacity deficit after the closure of Ignalina NPP.

For the longer prospective until 2020, Latvia is willing to take part in construction of the new nuclear power plant in Lithuania. Latvian share in the project might be in the range of 400…600 MW.

Lithuanian Grid Development Plans

The Main Events at the 2007

The main attention was paid to reconstruction of 110-330 kV substations.

Reconstruction of Vilnius 330/110/10 kV substation – one of the most important objects of Lithuanian transmission grid was continued in 2007. Investments for this project are about 85 mill. Litas (~€ 24.6 mln.).

Reconstruction or construction of seven 110 kV transformer substations were finished in 2007, twenty two were in different stages of reconstruction as well.

Lietuvos Energija AB started design works of new 330 kV line Telsiai – Klaipeda. After construction of this line Klaipeda substation will be finally connected to the transmission grid of Lithuania by 330 kV line.

Prefeasibility studies for a few other 330 kV lines started in 2007.

Total investments to the transmission grid were about 152 mln. Litas (~€44 mil.)

Future Plans

Lietuvos Energija AB plans to build five new 330 kV transmission lines in Lithuania during the period up to the year 2020:

Klaipėda – Telšiai (~ 90 km);
Panevėžys – Mūša (~ 80 km);
Kruonis – Alytus (double-circuit 53 km);
Vilnius – Neris (~ 80 km);
Ignalina – Kruonis (~ 200 km).

These lines are necessary for strengthening of northern part of 330 kV grid and for transfer of greater power flows from planned New Nuclear Power Plant.
Presently Lithuania has no interconnection lines with the EU member states. It is planned to construct a double circuit 400 kV line from Lithuania to Poland
Alytus (LT) – Ełk (PL) with a projected transfer capability of 1000 MW. Expected completion of the project is 2015. For implementation of this project it is required to build Back-to-Back converter station near Alytus substation and additional 330 kV double-circuit transmission line Kruonis – Alytus.

Another interconnection between Lithuanian and Swedish power systems is planned via 700-1000 MW submarine HVDC cable (~ 350 km). Expected completion of the project is 2016.

Presently Lithuania has no interconnecting lines with the EU member states.

Interconnection Lithuania – Poland

The interconnection project between Lithuanian and Polish power systems is listed as the project of EU priority and is included into the „quick start“ program, because interconnection Lithuania – Poland would enable integration to the EU internal electricity market not only the market of Lithuania, but the Common Baltic market as well.

It is planned to construct a double circuit 400 kV line Alytus (LT) – Ełk (PL) with a projected transfer capability of 1000 MW, i.e. up to 8 TWh per year could be exported or imported via such line. For implementation of this project it is required to build Back-to-Back converter station near Alytus substation and additional 330 kV double-circuit transmission line Kruonis – Alytus. Report summarizing a study assessing the feasibility of the project of interconnection of Lithuanian and Polish power systems was finished in July, 2007. Expected completion of the project is 2012 – 2015.

Interconnection Baltic – Sweden

The interconnection between Lithuanian and Swedish power systems is planned via 700 – 1000 MW submarine cable (~350 km). the possible connection points – Klaipėda on Lithuanian side and Hemsjö or Nybro on Swedish side. In 2 June 2007 was signed an Agreement between Lietuvos Energija AB, Svenska Kraftät and SWECO International AB “On preparation of Feasibility Study for an electrical interconnection between Sweden and Lithuania”. Feasibility Study includes market analysis, financial and economical modelling (Stage 1), deeper technical, environmental and procurement issues (Stage 2). Objective of the Study is evaluation of financial and economical feasibility of an interconnection, assessment of legal and environmental impediments and proposal the most appropriate and viable way to forward for the Project. It is planned to finish Feasibility Study in beginning of 2008. Expected completion of the project is 2016.

New Generation

Presently, the total installed capacity of power plants operating in the Lithuanian power system equals 4956 MW. Taking into consideration that a part of this capacity is used for own needs of power plants, the maximum available capacity equals approx. 4550 MW.

Operation of Unit 1 of the Ignalina NPP was terminated on December 31, 2004, Unit 2 will be closed by the year 2010.

After a full closure of Ignalina NPP, Lietuvos PP will become the main generating source. To compensate the lost capacity after the closure of Ignalina NPP and to increase competitive ability of electricity generation in Lietuvos PP, the feasibility to install two new combined cycle gas turbine units in Lietuvos Power Plant was analysed. The capacity of one unit would be about 400 MW.

New two generating units with total installed capacity about 326 MW will be constructed in Kaunas CHP in 2012.

Connection to the power system of 50 MW generation unit in Mazeikiai CHP is under examination.

A new combined cycle heat and power plant with gas turbines will be constructed in Panevėžys. Operation of the first unit of 35 MW started at the end of 2007. The second unit of this power plant should be launched around the year 2013.

There are considerations regarding the construction of a new combined heat and power plant in Klaipėda, which would be operated by burning local fuel and waste. The construction of this power plant should be finalized in 2012. Its capacity should be approx. 20 MW.

The laws of the Republic of Lithuania regulate and promote the construction of new renewable energy sources. In 2010, the quantity of electric energy produced by using renewable energy sources should constitute 7 percent of the total consumed electricity quantity in 2010. For this purpose capacities of wind parks should reach approximately 200 MW.

New Nuclear Power Plant Project in Lithuania

In January 2006 an energy conference was convened in Vilnius, where representatives of governments of the three Baltic States reached an agreement regarding preparation of a feasibility study for construction of a new nuclear power plant.

On 27 February 2006 the Prime Ministers of Lithuania, Latvia and Estonia issued a Communiqué whereby they expressed their approval for the construction of a new nuclear power plant and invited national power companies to invest in this Project.

On 8 March 2006 a Memorandum of Understanding regarding the preparation of a feasibility study for the construction of a new nuclear power plant has been signed by the top managers of Lietuvos Energija AB, Latvenergo AS and Eesti Energija AS.

On 25 October 2006 the Project Steering Committee approved the feasibility study report which concluded that the construction of a power plant in Lithuania was feasible.

In December 2006 the Board of Lietuvos Energija AB consented to establishment of the Nuclear Energy Department. The function of the Nuclear Energy Department is to manage the performance of the Project's preparatory works:

- Environmental Impact Assessment;
- Technology Assessment;
- Preparation of territorial planning documents;
- Construction site studies;
- Heavy equipment delivery study;
- Preparation of educational programs;
- Preparation of IT strategy;
- Preparation of Human Resource strategy;
- Negotiations with project partners;
- Decision to secure project financing, etc.

In March 2007 the Prime Minister of Lithuania and the Prime Minister of Poland, signed a bipartite Communiquè on co-operation in the energy field.

On 28 June 2007 the Seimas of the Republic of Lithuania passed the Law on Nuclear Power Plant.

On 4 July 2007 the President of the Republic of Lithuania signed the Law on Nuclear Power Plant. The law became effective on 10 July, after it was published in the Official Gazette.

The Milestones and Intermediate Results of the NNPP PROJECT Preparatory Works

Environmental Impact Assessment (EIA)

In April 2006, the Ministry of Environment of the Republic of Lithuania assigned the participants of the EIA of the new nuclear power plant.

On 4 June 2007 Lietuvos Energija AB signed a contract with a consortium, which undertook to develop a program of EIA of the new nuclear power plant.

On 15 November 2007 EIA program of a new nuclear power plant, initiated by Lietuvos Energija AB, has been confirmed by the Ministry of Environment of the Republic of Lithuania.

On 4 February 2008 Lietuvos Energija AB has signed an agreement with a consortium which is going to conduct a study and prepare a report of EIA for the new nuclear power plant.

Latvia, Poland, Belarus, Estonia, Finland and Sweden are participating in the EIA process.

Study of the Construction Site

On 9 November 2007 Lietuvos Energija AB concluded a contract with Civil engineering and design company to determine a possible scheme of the construction site and that of the auxiliary construction sites.

On 12 December 2007 an interim report on the designs offered for the NNPP was submitted.

Technology Assessment

The Nuclear Energy department of Lietuvos Energija AB together with the representatives from Latvenergo AS and Eesti Energia AS, in order to be aware of on the international market available technologies of reactors and their technological specifications, and to properly get ready for the tender to purchase nuclear power plant facilities, in November-December 2007 held a meeting with all suppliers of modern reactors: General Electric-Hitachi, AREVA NP, Atomic Energy of Canada Limited (AECL) and Westinghouse Electric Company LLC.

Negotiations with Project Partners

On 9 January 2007 the representatives of Eesti Energia AS, Latvenergo AS, Lietuvos Energija AB and Polskie Sieci Elektroenergetyczne SA established a joint four party Expert Group to negotiate conditions for Polskie Sieci Elektroenergetyczne SA entering the project of a new nuclear power plant in Lithuania, and negotiations are undergoing.

In February – December 2007 four Parties are negotiating governance principles for the project preparatory phase.

TSO international cooperation

Baltic Countries Towards the UCTE

On June 11th, 2007 the Prime Ministers of the Baltic States signed the Communiqué calling TSO's from Estonia, Latvia and Lithuania to undertake a full feasibility study on the synchronization of the Baltic electricity transmission system with the UCTE synchronous area. PSE – Operator S.A. as UCTE TSO adjoining Baltic TSO's was invited to the cooperation. On October 30th, 2007 the Cooperation Agreement among three Baltic TSO's and PSE – Operator was signed with the aim to work jointly within the framework of the TSO's scope of activities, competences and responsibilities with the aim to analyse, investigate, assess and evaluate all possible scenarios of integration of the Baltic electricity market into CEE regional electricity market. As a first step of cooperation the Task Force with representatives of OÜ Põhivõrk, Augstsprieguma tīkls AS, Lietuvos Energija AB and PSE – Operator S.A. was established with the task to conduct a pre-feasibility study. The Task Force was under the obligation to perform the preliminary calculations based on simplified assumptions and to deliver conclusions and recommendations concerning investigated scenario of synchronous interconnection.

According to the preliminary calculations, provided by the WG members, costs, associated with necessary investments in Baltic and Polish power systems which are identified so far as minimum preconditions for synchronous operation with UCTE sum up to 2,5 billion EUR.

To assess full scale of necessary investments and actions related to synchronous interconnection the following next steps are required:

- Dynamic stability analysis – necessary to evaluate system behaviour in case of frequency disturbance and to identify the inter-area oscillations in the extended interconnected system of UCTE;
- Evaluation of costs related to disconnection of Baltic power systems from IPS/UPS interconnection based on agreements with eastern neighbours Russia and Belarus.

Full scope Feasibility study must be performed by UCTE based on UCTE requirements.

Cooperation of Transmission System Operators of Baltic States, Russia and Byelorussia (BRELL)

The Baltic's operates synchronously with the UPS of CIS via power loop made of up of 330 kV and 750 kV overhead lines. On 07 February 2001 the concern "Belenergo", UPS of Russia (RAO "EES Rossii"), Eesti Energia AS, Latvenergo AS and Lietuvos Eergija AB conclude the new Agreement on Parallel Operation of their Power Systems and established the BRELL. That is a body for co-operation between the transmission system operators in Belarus, Russia, Estonia, Latvia and Lithuania. Currently the Russian side has been represented by two Russian companies: OAO FSK and OAO SO – EES. Belarusian side has been represented by vertically integrated power utility GPO "Belenergo".

Objectives and Role

BRELL organization shall maintain conditions necessary for reliable operation and interconnection of the power systems of Belarus, Russia, Estonia, Latvia and Lithuania and deal with:

- coordination in the area of System Design Criteria and Operation Standards;
- coordination in the area of development of the BRELL transmission system long term planning of the 220-330-750kV network;
- modelling of the BRELL`s 220-330-750kV network;
- to develop and maintain relations with other relevant

organizations and institutions in the BRELL states;
- O&C (incl. Short-term planning of maintenance and performing switches of cross-border lines, information exchange and coordination between control centres in normal and emergency situations etc.);
- to develop and maintain condition regarding Inter TSO Compensation.

The meetings of BRELLs Leaders are the highest decision-making body which at it's meetings shall approve the resolutions and recommendation passed by BRELL's Committee and shall also:
- consider information on the activities of the Committee and its WG's;
- appoint and dissolve members of BRELL's Committees.

The BRELL Committee is a collegiate executive body of the organization and consists of not more then three representative from each state (as a rule-two representatives) from each member state. The Committee meets as frequently as practicable in each member country in rotation, and the meetings are convened by the Secretariat. The functions of the Committee are to:
- prepare and draft resolutions for the Leaders' Meeting and adopt recommendations taken in the meeting;
- establish ad hoc Working Groups to research and analyze specific matters which may arise;
- approve annually based plans of all permanent WG's and supervise the activities of WGs;
- review and consider reports made by WG's.

Good collaboration within BRELL provides the technical prerequisites for trading, taking into account the conditions prevailing in each country. Committee shall contribute to international co-operation and information exchange pertaining to the power system and the electricity market.

BRELL has not any obligation to publish reports or corresponding information and has not budgeted.

The Secretariat is a permanent body of BRELL Committee which ensures its day-to-day operations. The functions of the Secretariat are performed by the members in rotation so that each member performs the functions of the Secretariat for one reporting period and is responsible for the Secretariat's expenses during that period.

In the 2007 reporting period the functions of the Secretariat of BRELL were performed by Belenergo and OÜ Põhivõrk will perform the task of Secretariat of BRELL Committee since the 01 January 2008.

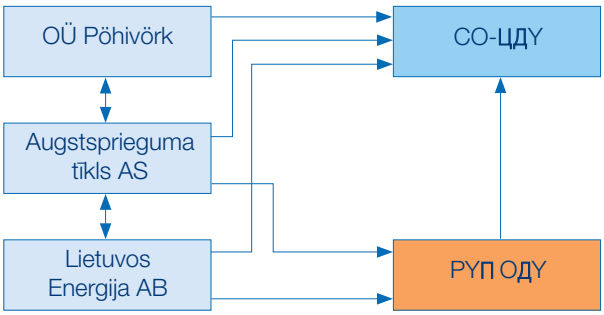
The BRELL Committee is entitled to appoint working groups. Currently there are six WGs and two ad hoc groups:
- Development WG (convener Estonian TSO);
- ITC WG (convener Russian side);
- System Services WG (convener Russian side);
- ICT WG (convener Estonian TSO);
- Reliability & Security WG (convener Belarusian side);
- O&C (convener Belarusian side);
- "ad hoc" Balance Services WG (convener Russian side);
- "ad hoc" for performing changes in O&C and short-term planning since 01.07.2008 (convener Russian side);

Latest Changes

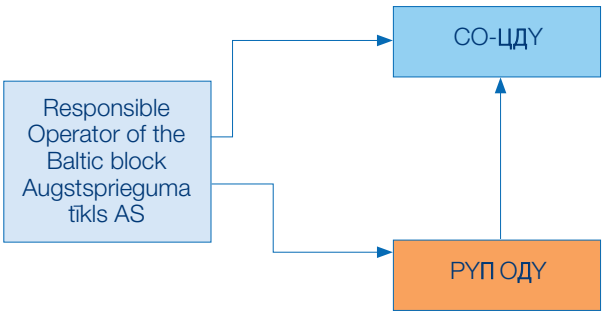
In the beginning of 2006, in response to changes on the energy market, all Baltic states agreed to denounce the Treaty on Parallel Operation of Baltic Power Systems, followed by liquidation of Baltic TSOs common Dispatch Center DC Baltija by 01 October 2006. The liquidation of DC Baltija determined the changes in standpoints of operation and control and short-term planning of parallel operation of BRELL Power Systems: since the 01 July 2008 some functions of planning and control in BRELL will be decentralized. Since the 01st of July, 2008 responsibility for medium and short-term planning will be organized as follows:
- annualy based: Belarusian side;
- monthly based: Latvian side;
- day ahead: Russian side.

Also the changes will be in subordination structure, as follows:

Since the 1st of July, 2008



Previous scheme, untill the 1 st of July, 2008



Cooperation of Transmission System Operators of Baltic States, Poland and NORDEL

In February of 2008, the TSOs of the Baltic States, Poland, Finland and Sweden decided to start up cooperation in order to improve multiregional system planning and coordination in the Baltic Sea Region. Having this in mind, they signed the Memorandum of Understanding (MoU). The aim and purpose of this MoU is to set forth Parties' mutual understanding and principles for system planning cooperation around the Baltic Sea. The MoU was signed by the TSOs as follows: PSE – Operator S.A. of Poland, Svenska Kraftnät of Sweden, Fingrid OYJ (NORDEL) of Finland, Lietuvos Energija AB (BALTSO) of Lithuania, Augstsprieguma tīkls AS (BALTSO) of Latvia and OÜ Põhivõrk (BALTSO) of Estonia.

The strategic objective of the Baltic power systems is to integrate local power markets to European power market area and to increase security of supply in the whole region. The goal of Nordic and Polish TSOs is to promote the development of the electricity market and to enhance coordination of planned interconnections. By reaching these goals, the whole market region of the Baltic Sea would be more strongly integrated to the European electricity market.

The co-operation is being launched to establish coordinated and transparent planning practice between NORDEL, BALTSO and Polish TSO, to develop coordinated extension plan of interconnections from Baltic to NORDEL area and to Poland in order to satisfy transmission needs between areas. It is also an objective to create the continuous discussion forum for power system planning experts around the Baltic Sea area.

Results of the analyses will be coordinated long-term development plan for the interconnections between the regions through:

- harmonized planning criteria and technical requirements at each synchronous region;
- combined regional scenarios and hypothesis of power exchange, adequacy of power supply during different seasons of the year;
- regional power system model and analysis;
- socio-economic benefit to whole Baltic Sea region.

The MoU arranges organisational structure for cooperation, which includes a steering group consisting of the heads of the planning departments, working groups to be set. If needed additional experts shall be involved. Working group shall be chaired by the compilation of the first development plan, i.e. by Fingrid OYJ. The chairmanship will rotate between the parties on an annual basis in the following order: Fingrid, OÜ Põhivõrk, Augstprieguma tīkls AS, Lietuvos Energija AB, PSE – Operator and Svenska Kraftnät.

Statistics

Main Operation Indicators

Table 2. Main operational indicators of Baltic IPS in 2007

TSO	Measure	Estonia	Latvia	Lithuania	Baltic IPS
Installed capacity as at 01.01.08 (net)	MW	2176,2	2178,5	4768,8	9123,5
Share of Baltic IPS	%	23,9	23,9	52,3	100,0
Peak Load	MW	1525,6	1372,7*	1750,0	4812.0*
Net consumption 2007	GWh	7933,2	7533,0	10066,1	25532,3
Net consumption 2006	GWh	7322,1	7138,9	9771,3	23406,1
Change compared to 2006	%	7,7	5,2	2,9	8,3
Total net generation 2007	GWh	10519,3	4533,3	11438,1	26490,8
Nuclear power	GWh			9074,9	9074,9
Termal power	GWh	10439,4	1610,7	2133,5	14183,6
Hydro power	GWh	0,0	2703,4	321,1	3024,5
HPSPP (gen)				537,5	537,5
HPSPP (pump)				760,9	760,9
Wind power	GWh	80,0	52,0	97,6	229,6
Other	GWh	0,0	167,3	34,5	201,8
Total net generation 2006	GWh	8442,5	4402,1	12498,4	30204,9
Change compared to 2006	%	19,7	2,9	– 9,3	– 14,0
Population	thousand	1340,6	2269,6	3366,0	6976,2
Consumption per capita	kWh	5917,7	3319,1	2990,5	3659,9
Export of electric power	GWh	3986,0	420,6	2539,9	
Import of electric power	GWh	1400,0	3420,3	1167,9	
System Saldo	GWh	2586,0	– 2999,6	1372,0	
Output to grid	GWh	10663,9	9496,0	12199,0	
Losses in main grid 2007	GWh	368,7	291,5	330,3	990,5
	% of output	3,5	4,2	2,7	
Losses in main grid 2006	GWh	283,3	281,6	328,3	893,2
Change compared to 2006	%	23,2	3,4	0,6	9,8

* – gross (from Augstsprieguma tīkls AS SCADA)

Figure 1. Capacity of different types of plants at 01.01.2008, MW

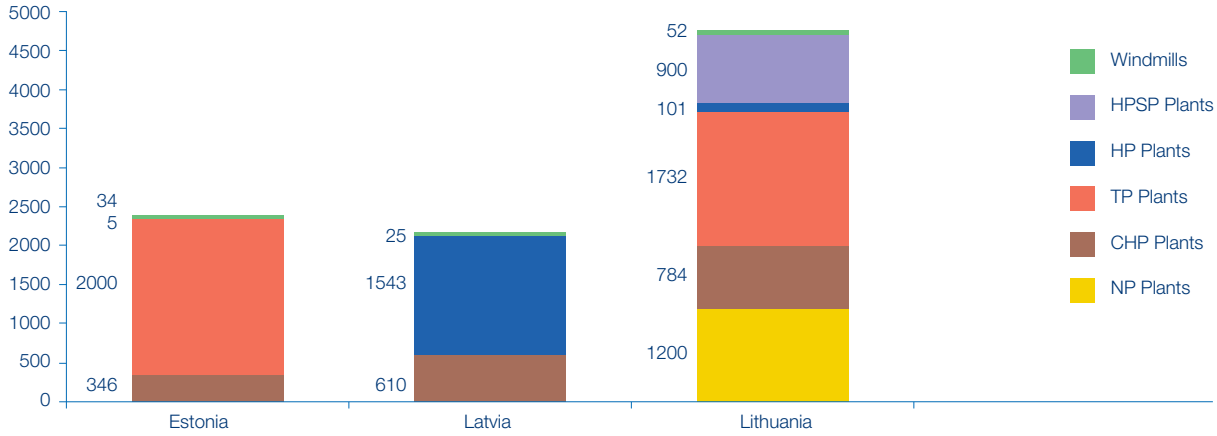


Table 3. Capacity of different types of plants at 01.01.2008, MW

TSO	Estonia	Latvia	Lithuania	Baltic IPS
TOTAL	2385	2179	4769	9332
TPP	2000*		1732	3732
CHP	346*	610	784	1740
HPP	5	1543	101	1649
HPS			900	900
NPP			1200	1200
WP	34	25	52	111

* – Unit 11 on Eesti PP is operated in both co-generation and condensation cycles

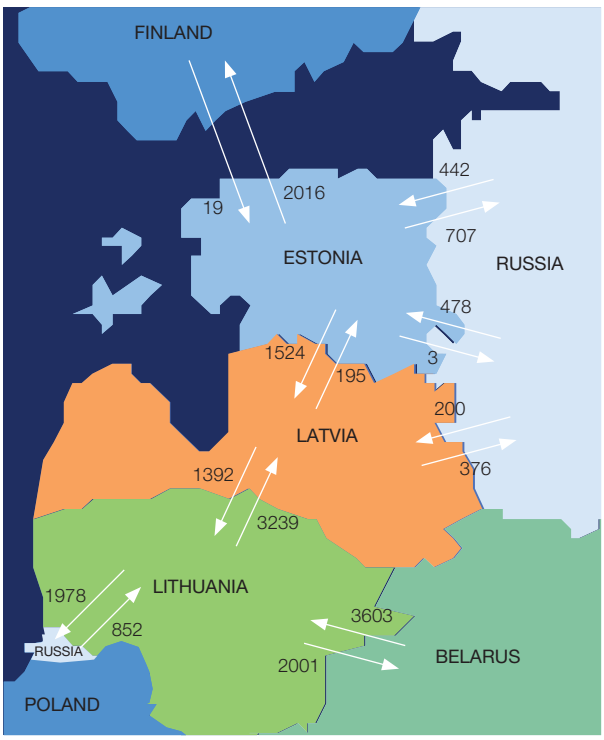
Table 4. Length of 330 kV OHL, km

TSO	Amount as at 01.01.2007	Built in 2007	Amount as at 01.01.2008
Estonia	1515,0	0,0	1515,0
Latvia	1247,9	1,4	1249,3
Lithuania	1670,4	0,0	1670,4
Baltic IPS	4433,3	1,4	4434,7

Table 5. Number and capacity of transformers in the 330 kV grid, MVA

TSO	Amount as at 01.01.2007		Built in 2007		Amount as at 01.01.2008	
	number	MVA	number	MVA	number	MVA
Estonia	15	2555	0	0	15	2555
Latvia	19	2825	1	250	20	3075
Lithuania	21	3325	2	650	23	3975
Baltic IPS	55	8705	3	900	58	9605

Exchange of Electricity in 2007, GWh



Maximum and Minimum Load

Table 6. Peak load for each power system (net)

TSO	Peak load MW	Date	Time	temperature at the time of max (°C)	Generation, MW						
					TP Plants	NP Plants	HPSPP	HP Plants	Windmills	ESTLINK	Small PP
Estonia	1525,6	23.02.07	10:00	–15	1605,2				1,7	293,0	45,8
Latvia (gross)	1372,7	23.02.07	10:00	–18,9	441,3			627,4	1,7		20,0
Lithuania	1750,0	17.12.07	17:00	1,1	584,0	1253,0	220,0	40,0	8,0		5,0

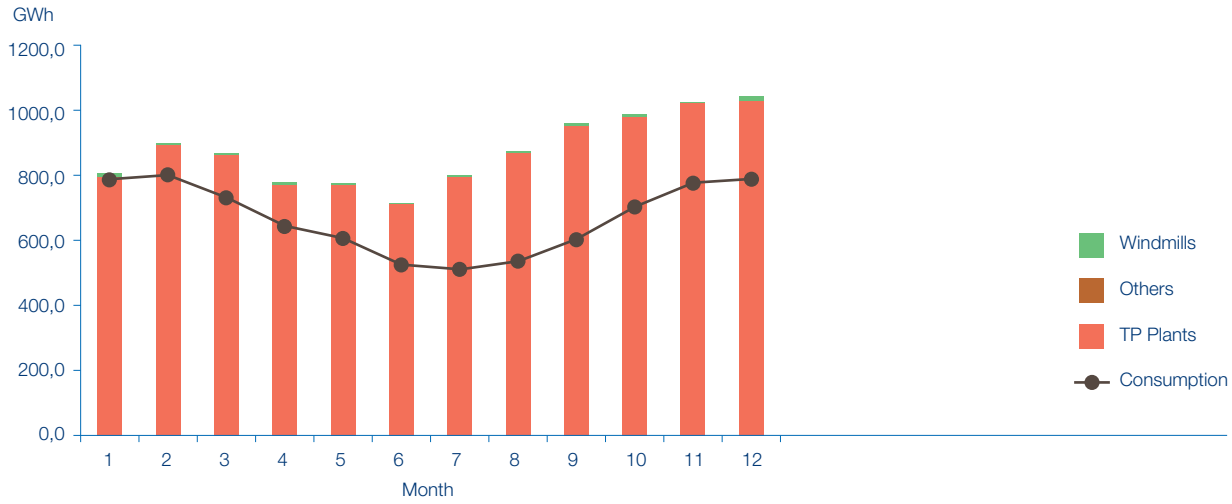
Table 7. Minimum load for each power system (net)

TSO	Peak load MW	Date	Time	temperature at the time of min (°C)	Generation, MW						
					TP Plants	NP Plants	HPSPP	HP Plants	Windmills	ESTLINK	Small PP
Estonia	442,1	22.7.2007	6:00	9	584,4				0,8	-92,0	14,0
Latvia (gross)	415,1	24.6.2007	6:00	13,6	128,6			0,0	0,3		8,0
Lithuania	662,0	25.6.2007	6:00	13,4	151,0	1222,0	-220,0	21,0	5,0		5,0

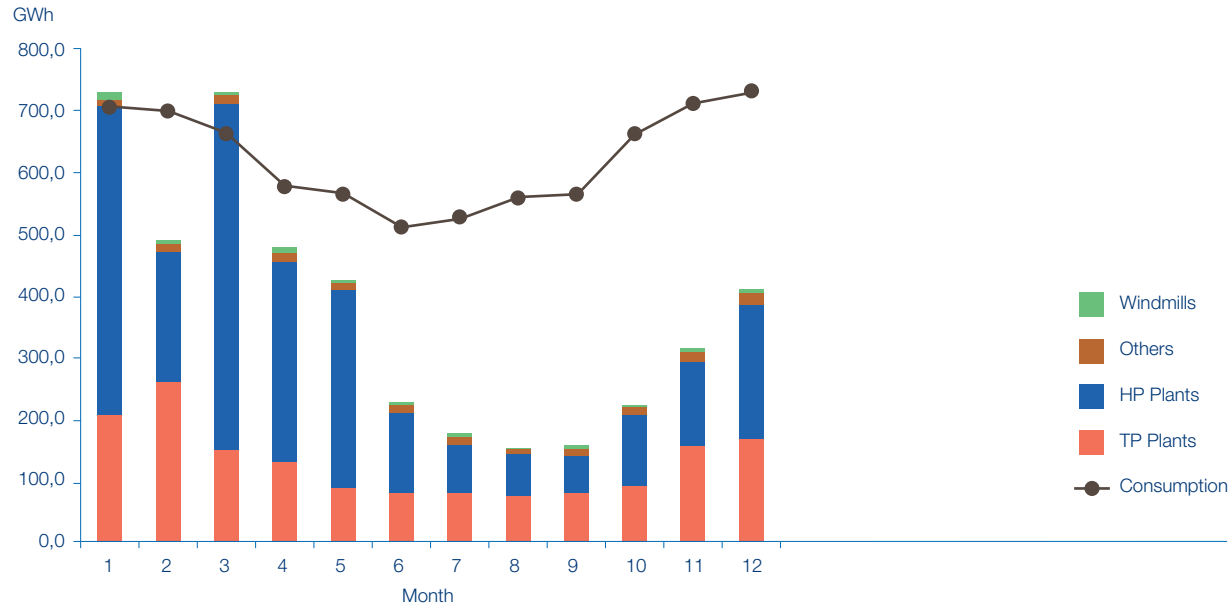
Table 8. Baltic IPS winter peak 23.02.2007 10:00

TSO	Peak load MW	temperature at the time of min (°C)	Generation, MW						
			TP Plants	NP Plants	HPSPP	HP Plants	Windmills	ESTLINK	Small PP
Estonia (net)	1525,6	–15	1605				2	293	46
Latvia (gross)	1372,7	–19	441			627	2		20
Lithuania (gross)	1930,0	–17	545	1343	202	50			58
Baltic IPS (gross)	4812.0*		2591	1343	202	677	3	293	124

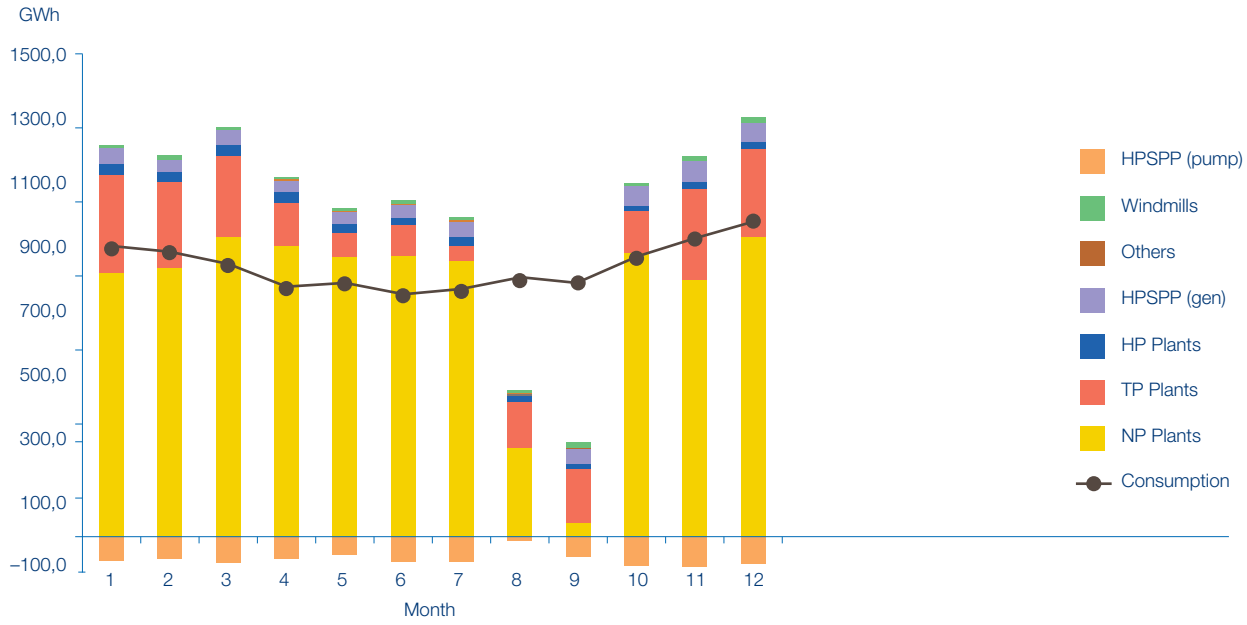
Net consumption & generation energy by month in Estonia, GWh



Net consumption & generation energy by month in Latvia, GWh



Net consumption & generation energy by month in Lithuania, GWh



Renewable Energy

Table 9. Renewable energy installed capacity and generation

TSO	Estonia		Latvia		Lithuania	
	Net capacity MW	Produced GWh	Net capacity MW	Produced GWh	Net capacity MW	Produced GWh
Windmills	34,2	98,96	25,20	51,21	52,00	97,64
Small HPP	112	32,78	25,13	64,01	26,44	96,31
Biomas PP			2,85	2,12	27,47	47,90
Biogas PP			7,79	26,52	1,54	5,32
Total	146,2	131,7	61,0	143,9	107,4	247,2

Appendixes

Installed Capacity for PP with Installed Power of 50MW

Table 10. Installed capacity, MW

TSO	Gross		Net	
	01.01.2007	01.01.2008	01.01.2007	01.01.2008
Estonia				
BATLI PP	765	765	654	654
EESTI PP	1615	1615	1346	1346
IRU CHP	165	98	162	98
Windmill	34,2	34,2	34,2	34,2
SmallPP	112	112	44	44
	2691,2	2624,2	2240,2	2176,2
Latvia				
PIAVINAS HPP	868,5	868,5	860	860
KEGUMS HPP	264,1	264,1	261	261
RIGAS HPP	402	402	397	397
RCHP-1	144	144	139	139
RCHP-2	330	330	300	300
Imanta CHP	44,61	44,61	42	42
Windmill	25,2	25,2	25,2	25,2
SmallPP	115,9	129,2	115,9	129,2
Small HES	24,9	25,12	24,9	25,12
	2219,21	2232,73	2165	2178,52
Lituania				
Ignalina NPP	1300	1300	1200	1200
Lietuvos PP	1800	1800	1732	1732
Vilnius CHP 3	360	360	344	344
Kaunas CHP	170	170	161	161
Mazeikai CHP	160	160	148	148
Kaunas HPP	100,8	100,8	100,8	100,8
Kruonio HPSPP	900	900	900	900
Windmill	49,15	52	49,145	52
SmallPP	45	133	43	131
	4884,945	4975,8	4677,945	4768,8

Power System Load

Table 11. Peak load and average temperatures by month in 2007

TSO	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Estonia												
Peak load(MW),net	1463	1526	1332	1185	1172	976	918	1015	1117	1257	1424	1411
Change compared to 2006 (%)	– 6	4	1	2	11	1	9	7	12	3	8	7
Average ambient temperature (°C)	– 0,9	– 8,0	3,0	5,2	11,0	15,1	16,9	17,8	11,7	7,2	1,1	2,3
Normal temperature (°C)	– 5,5	– 5,7	– 2,1	3,4	9,8	14,5	16,4	15,5	11,1	6,5	1,4	-2,8
Latvia												
Peak load(MW), Gross	1314	1373	1213	1148	1049	970	956	1009	1062	1192	1341	1337
Change compared to 2006 (%)	– 8	3	0	4	8	– 3	5	5	6	2	7	5
Average ambient temperature (°C)	0,7	– 7,4	5,0	5,3	12,5	16,3	16,3	18,0	11,8	6,8	0,8	0,8
Normal temperature (°C)	-4,4	-3,8	0,0	5,9	12,6	16,8	17,9	17,0	12,4	7,5	2,3	-2,0
Lithuania												
Peak load(MW),net	1624	1696	1529	1430	1474	1338	1308	1728	1453	1537	1735	1749
Change compared to 2006 (%)	– 13	– 2	– 4	1	14	4	4	23	8	4	7	6
Average ambient temperature (°C)	1,1	– 6,7	5,3	6,7	14	18	17,7	19,3	13,2	7,8	1,4	1,1
Normal temperature (°C)	– 5,1	– 4,6	– 0,7	5,4	11,9	15,4	16,7	16,2	11,9	7,2	2	– 2

Table 12. Estonian Net Consumption & Generation on day of peak load (23 Feb), MW

Hour	Consump.	Generat.	BATLI PP	EESTI PP	IRU CHP	Windmill	SmallPP	Estlink
1	1166,4	1517,9	298,3	1043,4	141,2	6,0	47,3	284,3
2	1141,3	1290,3	299,0	818,1	138,1	3,5	47,5	293,0
3	1129,5	1240,2	290,8	779,9	134,6	3,6	47,3	293,0
4	1126,5	1238,5	286,7	787,4	129,5	4,7	47,2	293,0
5	1141,4	1254,6	292,9	792,7	134,2	4,1	47,1	293,0
6	1175,4	1339,9	291,4	873,8	140,2	4,4	46,9	293,0
7	1288,1	1394,0	293,7	918,3	146,9	4,9	47,7	293,0
8	1393,3	1616,1	294,1	1140,9	146,8	4,1	47,1	293,0
9	1484,4	1621,9	295,2	1152,8	139,7	2,7	47,2	293,1
10	1525,6	1639,5	300,5	1166,8	137,9	1,7	45,8	293,0
11	1503,7	1627,1	306,8	1147,4	138,8	1,0	47,1	293,0
12	1467,8	1632,7	308,0	1143,9	146,5	1,0	47,0	293,0
13	1421,0	1608,2	308,4	1123,3	142,6	0,1	46,3	293,0
14	1389,5	1592,4	309,4	1107,3	141,9	-0,1	46,3	293,1
15	1352,0	1555,9	310,6	1070,7	140,5	0,0	46,5	293,1
16	1325,1	1533,8	308,1	1045,0	146,3	0,0	46,6	293,1
17	1313,0	1529,3	309,9	1038,9	146,2	0,0	46,7	293,1
18	1335,1	1508,0	309,0	1020,1	145,1	0,1	46,3	293,1
19	1409,9	1486,2	305,2	1002,5	144,7	0,8	46,3	293,1
20	1392,8	1508,6	307,4	1020,5	146,4	1,8	46,8	293,1
21	1354,7	1570,2	306,4	1081,5	147,9	4,0	47,2	293,1
22	1311,4	1589,9	306,3	1100,6	148,5	4,3	48,2	293,0
23	1248,6	1556,4	306,3	1065,9	149,6	5,7	48,0	293,0
24	1196,4	1437,4	306,6	946,7	148,9	7,2	48,4	293,0
Total MWh	31592,9	35889,0	7251,0	24388,3	3423,1	65,6	1128,7	7024,0

Table 13. Estonian Net Consumption & Generation on day of minimum load (22 July), MW

Hour	Consump.	Generat.	BATLI PP	EESTI PP	IRU CHP	Windmill	SmallPP	Estlink
1	578,0	1020,4	209,0	784,0	0,0	3,4	14,0	117,8
2	530,0	1010,1	207,9	775,4	0,0	2,7	14,0	117,9
3	502,2	881,6	208,9	647,0	0,0	1,7	14,0	19,8
4	494,3	817,7	207,4	585,5	0,0	0,8	14,0	19,9
5	457,3	765,7	157,5	582,2	0,0	0,8	14,0	19,8
6	442,1	610,4	120,5	463,9	0,0	0,8	14,0	-92,0
7	459,3	644,7	123,0	496,1	0,0	1,0	14,0	-91,8
8	513,5	780,6	123,7	631,0	0,0	0,8	14,0	19,8
9	547,0	926,3	130,7	770,0	0,0	0,8	14,0	19,8
10	602,2	971,8	131,7	814,4	0,0	0,8	14,0	19,8
11	633,0	1007,7	153,0	829,4	0,0	0,8	14,0	49,9
12	648,8	1011,3	159,9	825,3	0,0	0,8	14,0	148,9
13	649,2	1023,7	162,4	834,9	0,0	0,8	14,0	148,9
14	639,4	1019,3	162,8	829,4	0,0	1,0	14,0	148,9
15	644,3	1028,8	164,9	835,7	0,0	1,8	14,0	148,8
16	637,8	1018,3	164,7	825,8	0,0	1,6	14,0	148,9
17	621,6	994,9	146,8	819,4	0,0	2,8	14,0	148,9
18	620,6	1000,4	145,0	827,6	0,0	3,1	14,0	148,8
19	620,6	997,1	143,7	825,4	0,0	3,5	14,0	49,7
20	616,7	996,8	144,6	822,8	0,0	4,4	14,0	49,8
21	621,4	1013,5	157,2	827,3	0,0	3,3	14,0	-11,1
22	621,1	1003,1	154,5	818,1	0,0	3,9	14,0	-4,8
23	617,3	984,6	166,8	785,0	0,0	6,2	14,0	48,9
24	611,6	1057,9	209,0	811,6	0,0	11,1	14,0	10,8
Total MWh	13929,4	22586,6	3855,5	18067,1	0,0	58,5	336,0	1405,9

Table 14. Latvian Gross Consumption & Generation on day of peak load (23 Feb), MW

Hour	Consump.	Generat.	PIAVINAS HPP	KEGUMS HPP	RIGAS HPP	RCHP-1	RCHP-2	Imanta CHP	Windmill	SmallPP
1	947,4	486,6	0	0	0	138,5	288,9	34,8	4,4	20
2	904	558,4	68,4	0	0	142,3	289,8	34,6	3,3	20
3	885,5	575,1	89,6	0	0	138	290	34,4	3,1	20
4	878,5	575,5	89,7	0	0	137,4	288,8	34,8	4,8	20
5	883,5	615	89,7	16	25,3	137,3	287	35,2	4,5	20
6	933,6	658,9	89,7	36,3	50,9	137,5	286,3	35,1	3,1	20
7	1062,7	750,7	170,3	60,5	71,2	136,8	285,1	4,2	2,6	20
8	1198,6	861,5	245,7	71	101	136,6	283,9	0	3,3	20
9	1312,3	962,9	268,1	103,8	147,5	136,7	284	0	2,8	20
10	1372,7	1070,4	295,7	129,5	202,2	137	284,3	0	1,7	20
11	1361,4	1110,6	336,7	129,6	202,2	136,7	283,3	0	2,1	20
12	1341,1	1037,3	261,7	129,3	202,4	137,2	283	0	3,7	20
13	1297	984,7	262,1	77,1	202,9	137,2	277,9	0	7,5	20
14	1293,4	966,1	257,4	71,1	202,3	137,3	270,9	0	7,1	20
15	1275	900,7	251,2	72,5	158,7	137,6	256,2	0	4,5	20
16	1246,9	886,9	251	71,7	141,9	137,7	260,4	0	4,2	20
17	1225,5	852,4	250,4	71,9	101,2	137,6	266,8	0	4,5	20
18	1236,8	881,4	285,9	72	80,1	138	280,2	0	5,2	20
19	1340	1032,6	340,7	164,9	77,8	138,7	283,3	1,9	5,3	20
20	1321,1	1067,5	315,7	184,4	101,9	138,7	285,8	17	4	20
21	1281,5	898,1	202,1	110,7	101,6	138,5	287,1	32,8	5,3	20
22	1224,5	817	158,7	71	101,7	138,4	287,2	33,6	6,4	20
23	1119,9	685,8	83	54,7	59,6	137,9	288,1	34,9	7,6	20
24	1020,2	574,4	0	36,2	50,6	137,3	288,1	34,9	7,3	20
Total MWh	27963,1	19810,5	4663,5	1734,2	2383	3306,9	6766,4	368,2	108,3	480

Table 15. Latvian Gross Consumption & Generation on day of minimum load (24 Jun), MW

Hour	Consump.	Generat.	PIAVINAS HPP	KEGUMS HPP	RIGAS HPP	RCHP-1	RCHP-2	Imanta CHP	Windmill	SmallPP
1	538,9	104,3	0	0	0	68,9	0	27	0,4	8
2	507,5	94,9	0	0	0	64,8	0	21,7	0,4	8
3	484,7	95,2	0	0	0	65,4	0	21,2	0,6	8
4	463,3	102,2	0	0	0	70,6	0	22,7	0,9	8
5	423,7	114,7	0	0	0	80,2	0	25,9	0,6	8
6	415,1	128,9	0	0	0	88,2	0	32,4	0,3	8
7	423,9	118,4	0	0	0	77	0	33,4	0	8
8	441,7	118,7	0	0	0	77,2	0	33,5	0	8
9	478	120,9	0	0	0	79,5	0	33,4	0	8
10	526,5	126,1	0	0	0	83,8	0	33,5	0,8	8
11	558,1	128,1	0	0	0	85,9	0	33,4	0,8	8
12	571,9	191,3	60,3	0	0	88	0	33,2	1,8	8
13	572,5	217,9	89,7	0	0	85,1	0	32,6	2,5	8
14	570	214	89,5	0	0	81	0	32,5	3	8
15	566	228,5	89,6	15,1	0	79,7	0	32,3	3,8	8
16	563,8	229,6	89,5	17,7	0	79,1	0	32,2	3,1	8
17	570,6	168,2	39,1	7,8	0	79,1	0	32	2,2	8
18	577,6	126,1	0	0	0	83,2	0	32,8	2,2	7,9
19	601	190,7	0	14,5	44,8	89,5	0	33,2	2,7	6
20	617,4	207,2	0	17,5	50,2	97	0	33,5	3	6
21	627	182	0	17,5	50,1	105,6	0	1,2	1,6	6
22	618,4	182,2	0	17,4	50,2	108,1	0	0	0,5	6
23	631,3	184,6	0	17,4	50,1	110,6	0	0	0,5	6
24	594,8	114,4	0	0	5,6	102,4	0	0	0,4	6
Total MWh	12943,7	3689,1	457,7	124,9	251	2029,9	0	613,6	32,1	179,9

Table 16. Lithuanian Net Consumption & Generation on day of peak load (17 Dec), MW

Hour	Consump.	Generat.	Ignalina NPP	Lietuvos PP	Vilnius 3 CHP	Kaunas CHP	Mazeikai CHP	Kaunas HPP	Kruonio HPSPP	Windmill	SmallPP
1	1027,8	1683,0	1251,0	67,0	150,0	135,0	13,0	31,0	– 328,0	0,0	36,0
2	974,3	1683,0	1251,0	68,0	150,0	135,0	13,0	30,0	– 442,0	0,0	36,0
3	947,8	1681,0	1250,0	68,0	150,0	135,0	13,0	30,0	– 441,0	0,0	35,0
4	937,3	1680,0	1250,0	67,0	150,0	135,0	13,0	30,0	– 441,0	0,0	35,0
5	953,4	1682,0	1250,0	68,0	150,0	135,0	13,0	30,0	– 338,0	0,0	36,0
6	1031,3	1693,0	1249,0	80,0	150,0	135,0	13,0	30,0	– 222,0	0,0	36,0
7	1273,6	1752,0	1253,0	127,0	151,0	142,0	13,0	30,0	– 128,0	0,0	36,0
8	1528,5	1937,0	1254,0	162,0	150,0	142,0	13,0	37,0	144,0	0,0	35,0
9	1675,6	2082,0	1252,0	158,0	151,0	142,0	13,0	30,0	300,0	1,0	35,0
10	1683,3	2095,0	1256,0	198,0	151,0	142,0	13,0	22,0	276,0	2,0	35,0
11	1679,3	2059,0	1257,0	213,0	151,0	142,0	13,0	35,0	210,0	3,0	35,0
12	1664,3	2051,0	1255,0	193,0	151,0	142,0	13,0	49,0	209,0	4,0	35,0
13	1635,2	2060,0	1255,0	195,0	151,0	142,0	14,0	49,0	213,0	6,0	35,0
14	1660,7	2085,0	1256,0	195,0	151,0	142,0	13,0	43,0	243,0	7,0	35,0
15	1664,3	2081,0	1255,0	196,0	151,0	142,0	13,0	40,0	239,0	10,0	35,0
16	1689,5	2089,0	1255,0	206,0	151,0	142,0	13,0	40,0	238,0	9,0	35,0
17	1749,7	2067,0	1253,0	205,0	151,0	142,0	13,0	40,0	220,0	8,0	35,0
18	1743,1	2031,0	1253,0	201,0	151,0	141,0	13,0	25,0	204,0	8,0	35,0
19	1698,1	2087,0	1256,0	202,0	151,0	141,0	13,0	22,0	260,0	7,0	35,0
20	1648,8	2022,0	1253,0	203,0	151,0	141,0	13,0	22,0	200,0	5,0	34,0
21	1590,3	1989,0	1252,0	197,0	151,0	141,0	13,0	22,0	177,0	2,0	34,0
22	1498,2	1873,0	1253,0	199,0	150,0	141,0	13,0	22,0	59,0	2,0	34,0
23	1329,7	1817,0	1253,0	200,0	150,0	141,0	13,0	22,0	0,0	3,0	35,0
24	1178,3	1812,0	1255,0	199,0	150,0	136,0	13,0	22,0	–152,0	3,0	34,0
Total MWh	34462,4	46091,0	30077,0	3867,0	3614,0	3354,0	313,0	753,0	700,0	80,0	841,0

Table 17. Lithuanian Net Consumption & gGeneration on day of minimum load (25 Jun), MW

Hour	Consump.	Generat.	Ignalina NPP	Lietuvos PP	Vilnius 3 CHP	Kaunas CHP	Mazeikai CHP	Kaunas HPP	Kruonio HPSPP	Windmill	SmallPP
1	808,2	1397,0	1220,0	55,0	4,0	22,0	17,0	21,0	– 221,0	5,0	53,0
2	745,6	1396,0	1220,0	55,0	3,0	22,0	17,0	21,0	– 221,0	5,0	53,0
3	717,0	1395,0	1220,0	55,0	4,0	21,0	16,0	21,0	– 221,0	5,0	53,0
4	700,3	1395,0	1220,0	55,0	4,0	21,0	16,0	21,0	– 221,0	5,0	53,0
5	667,8	1394,0	1219,0	55,0	3,0	21,0	17,0	21,0	– 220,0	5,0	53,0
6	661,7	1396,0	1222,0	55,0	4,0	21,0	16,0	21,0	– 220,0	5,0	52,0
7	709,8	1393,0	1220,0	55,0	4,0	22,0	14,0	21,0	– 14,0	5,0	52,0
8	772,5	1391,0	1219,0	55,0	3,0	22,0	14,0	21,0	0,0	5,0	52,0
9	857,4	1393,0	1220,0	55,0	4,0	22,0	14,0	21,0	0,0	5,0	52,0
10	936,4	1398,0	1221,0	55,0	4,0	25,0	15,0	21,0	0,0	5,0	52,0
11	989,1	1395,0	1222,0	55,0	2,0	25,0	14,0	21,0	0,0	5,0	51,0
12	1007,9	1392,0	1218,0	55,0	3,0	25,0	15,0	21,0	0,0	5,0	50,0
13	1013,5	1392,0	1217,0	55,0	4,0	25,0	14,0	21,0	0,0	5,0	51,0
14	1006,3	1392,0	1219,0	55,0	3,0	25,0	14,0	21,0	0,0	5,0	50,0
15	995,6	1569,0	1217,0	55,0	4,0	26,0	14,0	21,0	178,0	5,0	49,0
16	985,4	1583,0	1217,0	55,0	4,0	26,0	13,0	21,0	192,0	5,0	50,0
17	976,1	1588,0	1219,0	55,0	4,0	26,0	14,0	21,0	194,0	5,0	50,0
18	971,5	1589,0	1221,0	55,0	4,0	26,0	14,0	20,0	194,0	5,0	50,0
19	969,9	1579,0	1225,0	55,0	3,0	26,0	15,0	20,0	180,0	5,0	50,0
20	967,2	1564,0	1223,0	55,0	3,0	29,0	14,0	21,0	164,0	5,0	50,0
21	972,8	1432,0	1223,0	55,0	4,0	29,0	14,0	21,0	31,0	5,0	50,0
22	967,0	1403,0	1222,0	55,0	4,0	30,0	15,0	21,0	0,0	5,0	51,0
23	969,3	1402,0	1221,0	55,0	4,0	30,0	15,0	21,0	– 149,0	5,0	51,0
24	944,3	1399,0	1219,0	55,0	4,0	27,0	17,0	21,0	– 215,0	5,0	51,0
Total MWh	21312,7	34627,0	29284,0	1320,0	87,0	594,0	358,0	502,0	– 569,0	120,0	1229,0

Output of PP by Year and by Month Divided by Generation Type

Table 18. Output of PP by month, GWh in Estonia

Month	Consumption	Generation	TP Plants	Windmills	Others	ESTLINK	Balance
January	785,4	805,6	797,0	8,6	0,0	209,1	20,3
February	799,6	896,9	893,5	3,4	0,0	163,3	97,3
March	727,9	864,9	859,3	5,6	0,0	211,5	136,9
April	633,5	778,3	770,6	7,7	0,0	109,0	144,8
May	600,5	773,5	769,7	3,8	0,0	74,2	172,9
June	512,9	718,4	714,3	4,1	0,0	115,1	205,5
July	500,3	798,1	792,6	5,6	0,0	118,2	297,9
August	525,6	872,4	867,0	5,4	0,0	110,8	346,8
September	593,7	960,5	951,9	8,6	0,0	128,7	366,8
October	696,5	985,7	978,8	6,9	0,0	230,3	289,2
November	771,1	1025,4	1016,8	8,6	0,0	255,2	254,2
December	786,1	1039,6	1028,0	11,6	0,0	271,6	253,5
Total	7933,2	10519,3	10439,4	80,0	0,0	1997,0	2586,1

Table 19. Output of PP by month, GWh in Latvia

Month	Consumption	Generation	TP Plants	HP Plants	Windmills	Others	Balance
January	706,9	728,0	210,3	496,3	8,8	12,6	21,1
February	704,0	490,1	263,0	209,3	3,6	14,2	– 213,8
March	665,1	730,8	152,8	558,4	4,4	15,2	65,8
April	584,7	478,0	132,7	323,8	4,5	16,9	– 106,7
May	573,1	425,9	93,2	316,8	2,4	13,5	– 147,1
June	516,7	228,2	84,5	128,9	3,3	11,5	– 288,4
July	532,3	178,3	82,8	79,9	4,0	11,5	– 354,1
August	563,5	158,9	79,7	66,5	3,2	9,4	– 404,6
September	567,4	159,5	83,9	60,4	4,2	11,0	– 407,9
October	668,7	226,9	95,1	114,4	3,1	14,3	– 441,8
November	715,4	317,0	160,1	134,7	4,6	17,6	– 398,5
December	735,3	411,7	172,6	213,8	5,7	19,5	– 323,7
Total	7533,0	4533,3	1610,7	2703,4	52,0	167,3	– 2999,6

Table 20. Output of PP by month, GWh in Lithuania

Month	Consumption	Generation	TP Plants	NP Plants	HP Plants	HPSPP (gen)	HPSPP (pump)	Windmills	Others	Balance
January	900,3	1154,2	304,5	821,3	35,5	48,5	65,2	9,5	0,2	253,8
February	886,0	1119,1	261,8	840,3	29,4	43,5	63,3	7,4	0,1	233,1
March	841,0	1203,9	245,5	935,8	36,7	46,7	70,5	9,5	0,3	362,8
April	761,2	1061,4	131,1	905,9	33,9	38,1	57,1	8,7	0,9	300,2
May	789,8	973,8	71,5	875,5	28,4	39,2	47,4	5,0	1,6	184,0
June	738,2	976,0	93,4	878,2	17,2	46,6	70,7	6,5	4,7	237,8
July	763,1	925,2	44,4	860,3	29,6	48,0	69,6	7,5	5,0	162,1
August	806,9	452,4	138,1	285,0	22,9	1,5	6,0	6,7	4,2	– 354,5
September	798,3	234,6	165,7	50,3	19,1	45,6	59,6	9,1	4,4	– 563,7
October	872,3	1018,6	127,6	884,9	20,4	57,7	83,3	6,9	4,5	146,4
November	927,1	1096,4	277,4	804,6	22,4	65,3	87,7	10,3	4,1	169,3
December	981,9	1222,6	272,6	932,9	25,6	56,7	80,4	10,8	4,4	240,6
Total	10066,1	11438,1	2133,5	9074,9	321,1	537,5	760,9	97,6	34,5	1372,0

Contact information
BALTSO Secretariat 2007 – 2008

Augstsprieguma tīkls AS

Postal address: Dārzciema iela 86, Rīga, LV-1073
Telephone: (+371) 67728 388
Fax: (+371) 67725 211
Website: www.baltso.eu
E-mail: baltso.secretariat@latvenergo.lv