

BALTIC ENERGY STRATEGY

I. INTRODUCTION

On 1st May 2004, Estonia, Latvia and Lithuania became full members of the European Union (EU). Membership opens the entire EU market for the Baltic economies with considerable opportunities for economic and cultural development. Common history, long-term cooperation and national policies harmonised with the EU policies, norms and standards create favourable conditions in the Baltic States for closer cooperation, and in particular in the energy sector.

Transition from a centrally planned to a free market economy in the Baltic States was accompanied by fundamental transformations: structural changes of the national economies, alteration of energy policies and gradual creation of market conditions. Over the last few years cooperation between the Baltic States has been directed towards preparation of common policy in the energy field, especially on creation of the sustainable, competitive and secure common energy market.

Currently the Baltic States altogether have a diverse energy mix, which is mainly based on contribution from oil shale in Estonia, hydro resources in Latvia and nuclear energy in Lithuania complemented with imported natural gas and oil products, and increasing share of local and renewable energy resources. Besides that, existence of the underground gas storage in Latvia and oil refinery in Mažeikiai is important facilities which contribute to energy security of the Baltic States.

However, the factors such as rapid economic growth in the Baltic States, significant increase of oil and natural gas prices, future decommissioning of Ignalina Nuclear Power Plant, the need for environmental upgrade of Narva Power Plants, dependency on gas supply from one supplier require an update of the common energy policy on future development of their energy sectors.

The Baltic States have comparatively well developed power, natural gas supply and district heating systems. The power and natural gas systems are well interconnected. However, interconnections outside the region are limited and oriented only towards Russia and Belarus. Up to now the Baltic States have no direct connection to the power systems of Central Europe. The dependence on gas supply from single source is the major concern for the Baltic States.

The Baltic Energy Strategy (hereinafter: Strategy) outlines a framework for the energy sector development in long-term perspective taking into consideration aspects of energy efficiency, energy security, sustainability and improved management. The Strategy focuses on strategic analysis of strengths and weaknesses in energy supply, threats for development of the energy sector and common activities directed to avoid feasible threats and to increase energy security in the Baltic States. The Strategy describes the most important measures which should be implemented seeking to ensure security of energy supply, to reduce negative impact from dominant dependency on energy import from one source and to improve the sustainability of the energy supply.

II. CURRENT SITUATION

The energy sector of the Baltic States has its strengths and weaknesses. It faces specific threats, however, has good opportunities for efficient and reliable operation. With more efficient use of the available opportunities and existing capacities, the energy sector of the Baltic States can enhance a more rapid economic development in the region, strengthening its competitiveness, reducing the possible threats and avoiding different unforeseen interruptions of energy supply.

Strengths

General

- 1) Diverse energy mix at primary energy supply;
- 2) Energy capacities are currently satisfactory to meet regional demands;
- 3) Relatively high level of qualified specialists in the energy sector.

Electricity

- 1) Strong interconnections between the Baltic States and with Russia and Belarus;
- 2) Diverse energy mix in electricity generation by technology and fuel;
- 3) Efficient co-operation between Baltic transmission system operators;
- 4) Current self-sufficiency in generation capacity.

Natural gas

- 1) Reasonably developed infrastructure;
- 2) Possibility to use alternative fuels by majority of largest customers;
- 3) Availability of gas storage facility.

Liquid fuels

- 1) Well-functioning markets;
- 2) Attractive transit route;
- 3) Availability of crude oil refinery;
- 4) Possibility to use non-conventional liquid fuels.

Weaknesses

General

- 1) Low energy efficiency in buildings, transport sector and district heating systems;
- 2) Different policy objectives among the Baltic States;
- 3) Small size of the energy markets;
- 4) Inadequate funding of education, research and development.

Electricity

- 1) Limited marketplace with small number of players on supply side;
- 2) Different policy objectives and legislation in the Baltic States;
- 3) Insufficient interconnection capacities with EU electricity markets;
- 4) Congestions in Russian transmission system may affect the electricity market functioning and operation of the power systems;
- 5) Insufficient technical quality of transmission and distribution systems;
- 6) Weak and non-transparent price signals for investments into new generation capacities;
- 7) Small size of the Baltic electricity market creates additional issues with large-scale nuclear power plants.

Natural gas

- 1) The Baltic States can currently buy natural gas only from Russia;
- 2) Gas supply contracts do not provide sufficient security of supply in peak periods;
- 3) Inadequate regulation of the natural gas market;
- 4) Limited throughput of infrastructure.

Liquid fuels

- 1) Low current level of biofuels usage;
- 2) Still continued development of security stocks of liquid fuel creates vulnerability in cases of supply disruptions;
- 3) Influence of politics on transit/supply.

Opportunities

General

- 1) Clearer political signals about the priorities and objectives can create transparent regulatory framework for efficient long-term energy supply;
- 2) Utilization of available energy saving potential will reduce the growth rate of energy demand and generating capacities;
- 3) Economically justified larger contribution of available indigenous and renewable energy resources will reduce dependence on imported fuel;
- 4) Existing infrastructure and experience are supportive for construction of new nuclear power plant;
- 5) Universities and scientific institutions in the Baltic States are capable to prepare qualified specialists;
- 6) Modernization of the existing district heating systems will promote the development of combined heat and electricity production;
- 7) Timely introduction of new energy sources and technologies.

Electricity

- 1) Potential interest of market participants to develop and invest in the electricity market;
- 2) Construction of interconnections with power systems of Finland, Poland and Sweden would increase reliability of electricity supply;
- 3) Positive attitude of societies in the Baltic States towards the use of nuclear energy will support the construction of new nuclear power plant in Lithuania;
- 4) Existing potential to have modern power systems in relatively short period;
- 5) Potential for reasonable increase in the usage of renewable energy sources;
- 6) Application of UCTE conditions on security of electricity supply.

Natural gas

- 1) Development of existing and new natural gas storages;
- 2) Development of transit routes;
- 3) Potential construction of the liquefied gas import/export terminal;
- 4) Research and development of non-conventional gas;
- 5) Enlargement of gas usage.

Liquid fuels

- 1) Potential exploration of local crude oil;
- 2) Further development of the use of non-conventional fuels;
- 3) More efficient use of port facilities;
- 4) More efficient use of storage facilities.

Threats

General

- 1) Worsening of security of energy supply situation;
- 2) Creation of inadequate incentives by national legislations;
- 3) Absence of common energy policy;
- 4) Opposition from local public and local authorities (NIMBY effect);
- 5) Fragmentation of the EU energy markets;
- 6) Vulnerability from global trends;
- 7) Slow modernization of district heating systems;
- 8) Deficiency of qualified specialists.

Electricity

- 1) Potential lack of production capacities;
- 2) Potential dominance of power supplies with dumping elements from Russia;
- 3) Potential sharp increase of electricity prices;
- 4) Unwanted developments of energy-mix;
- 5) Possibility of major network outages and/or blackouts;
- 6) Uncertainty regarding long-term supply of fuel for power plants.

Natural gas

- 1) Gas supply to the Baltic States is exposed to disruptions and potential sharp increases of gas prices;
- 2) Higher dependence on natural gas supply after the closure of Ignalina NP.

Liquid fuels

- 1) Potential concentration of the market;
- 2) Potential crude oil and its products' supply interruptions;
- 3) Potential environmental impact of transit.

III. GOALS FOR THE ENERGY SECTOR IN THE BALTIC STATES

European energy security demands in the 21st century require the development of a European External Energy Policy (EEP) closely aligned to the further strengthening of the Common Foreign and Security Policy (CFSP). Means must be found to enhance the EU institutional framework for this purpose. EU-NATO cooperation covering energy security must be explored and supported.

Global environment for the energy sector development could be characterized by processes and events, which cause new challenges for the energy supply and national security of the Baltic States:

- 1) Rapid increase of hydrocarbons consumption in the world, which is growing faster than exploration and development of new deposits;
- 2) Large share of oil and gas deposits are concentrated in countries with unstable political regimes and centralised political control over energy export;
- 3) Complicated political relationships among Western countries and countries which have large share of energy resources;
- 4) Increasing geopolitical influence of certain energy exporting states over energy importing countries, including mechanisms to dictate conditions for this import;

- 5) Strengthening of the role of the main economics – USA, EU, China and India – in energy markets and their bilateral partnership with Russia;
- 6) Volatility of oil and gas prices and their dependence on political factors;
- 7) Increasing tensions regarding reduction of GHG emissions for national governments.

Taking into consideration requirements and provisions in the Treaty of Accession to the EU, Energy Charter Treaty, EU legislation and the Green Paper, the Strategy has three main pillars:

- 1) Security of supply;
- 2) Sustainability;
- 3) Competitiveness.

Under these pillars, the following strategic objectives have been set:

- 1) To integrate power and gas supply systems into the energy systems and energy markets of the EU;
- 2) To diversify primary energy sources and supplies, and increase the contribution of renewable and local energy resources;
- 3) To increase the energy efficiency at the demand side and in the energy transformation sector;
- 4) To develop the transit routes for energy products, including electricity;
- 5) To strengthen education, research and development in the energy sector;
- 6) To elaborate and implement a common policy on energy imports from non-EU countries.

IV. TASKS FOR THE POWER SECTOR

There are a number of different primary energy sources in use in electricity generation in the Baltic States: hydro, oil-shale, nuclear, natural gas, orimulsion, wind, landfill gas, biomass, fuel oil, etc.

In the case of Ignalina NPP decommissioning in 2009 the major part of electricity will be generated by existing power plants (modernisation of Lithuanian Thermal Power Plant, renovation of units at Balti and Eesti power plants, construction of modern combined power and heat generation power plants and power plants at district heating utilities and industrial enterprises) the existing available capacities in the Baltic power system will be sufficient to meet the regional demand until 2015. However, a new nuclear power plant should be commissioned.

To reduce the dependence on expensive fossil fuels and harmful impact of emissions, and to increase overall energy security in the Baltic States, the construction of a new nuclear power plant should be studied in Lithuania. The small size of the Baltic power market (in 2015, expected maximum load is about 6000 MW) creates additional issues with large-scale nuclear power plants e.g., concerning reserve capacities.

Integration of the Baltic power systems into Central European and Nordic energy systems and closer collaboration with these countries, as well as expected distribution of load and generating capacities, stipulates a necessity to prepare strategy for the development of transmission system, action plan for its implementation and appropriate financial sources. Electricity distribution grid and transformer substations also should be renovated with a view

to complying with increasing requirements for the reliability and stability of electricity supply.

In order to ensure the strategic reliability of electricity supply and integration into the EU internal market, the following measures must be taken:

- 1) To develop cooperation and collaboration of the Baltic States - to facilitate a competitive environment, to enhance electricity transit, to establish common electricity market and to harmonise the Baltic market rules with the Nordpool area market rules, to create a framework for green house gases (GHG) allocations;
- 2) To prepare an action plan regarding further integration of the Baltic power systems into markets of Central Europe and Nordic countries;
- 3) To apply a request to UCTE President for conditions and terms of synchronous interconnection of the Baltic States power systems with UCTE;
- 4) To renew and build transmission and distribution facilities;
- 5) To renew the large power production capacities;
- 6) To use possibilities and benefits from development of distributed electricity generation;
- 7) To cooperate and to support the construction of interconnections between the Baltic States and the EU countries;
- 8) To increase the share of renewable energy sources in the electricity mix.

V. TASKS FOR THE NATURAL GAS SECTOR

The Baltic States have comparatively well developed technical systems of natural gas supply. Natural gas networks within the Baltic States are currently sufficient to cover the needs of the customers. The existence of gas storage in Incukalna with sufficient volume for the Baltic States and for North-West Russia provides reasonable security of gas supply in the region.

However, limited interconnection capacity between Latvia and Lithuania, limited output capacity of the storage in peak periods and limited interconnection capacity from Russia to the storage facility in Latvia are bottlenecks in the current natural gas networks in the Baltic States. Larger power stations and boiler houses have ability to use in the case of gas supply interruptions also light or heavy fuel oil or shale oil, decreasing so the vulnerability of the energy system from gas supplies.

Currently natural gas imports are handled by natural gas monopoly Gazprom and its subsidiaries. Domination of one natural gas supplier does not support liberalization of this market and dependence on supply from one source is the major concern. *Due to this reason it is difficult* to involve the projects of political interest in the investments strategies of the gas companies.

Taking into consideration the size and volumes of the Russian gas fields, the existing technical supply facilities and the more stringent environmental requirements, natural gas is one of the most attractive forms of fossil fuel in the Baltic States. In order to enhance reliability of the natural gas supply it is necessary:

- 1) To prepare feasibility study for construction of the regional liquefied gas import terminal and development of necessary infrastructure;
- 2) To prepare feasibility study for interconnection of Lithuanian and Polish natural gas systems;

- 3) To strive for financial support from the EU Structural Funds for construction of strategic pipelines connecting the Lithuanian and Estonian natural gas systems with gas networks in Poland and Finland.

VI. TASKS FOR THE LIQUID FUELS SECTOR

The share of petroleum products in the primary energy balance of the Baltic States currently constitutes about 26%. In 2005, total consumption of oil products amounted to almost 5 million tons. The retail market is well structured (several strong traders and suppliers) and the associated structures are operating properly. The ports of the Baltic States are well positioned for the large-scale liquid fuels transit from Russia to Europe and other countries as well as for their import from various countries. They have still a potential to be better exploited as liquid fuels transit hubs. There is one refinery with sufficient production volume (annual crude oil refining capacity is 10-11 million tons) within the Baltic States (in Mažeikiai) and several other refineries in reasonable range in the neighbouring countries.

In order to ensure reliable supply of the national economies with petroleum products, mandatory 90-day stocks will be accumulated gradually. All the Baltic States have a transition period for the creation of liquid fuels stocks. Currently only about half of these stocks are secured, which makes the Baltic States slightly more vulnerable to the potential risks of supply disruptions.

Indigenous oil resources are limited; however, extraction of local crude oil could be a competing source to imports of crude oil for several decades, maintaining the annual extraction level of about 0.2-0.4 million tons and reducing dependency on oil imports.

The share of petroleum products used for production of electricity and heat will decrease but fuel oil will remain a reserve fuel for thermal power plants and large district heating systems. The most noticeable increase in the consumption of light petroleum products is expected in the transport sector due to increasing international freight transportation and mobility of population.

An option for the future would be to produce transport fuels from oil-shale. The technologies for heavy fuel oil from oil-shale are today available in Estonia, and further development of oil-shale based diesel and gasoline is foreseen. The growing global interests for non-conventional liquid fuels will support the development of shale-oil production and would provide additional option for the increase the independence from imported energy resources.

There are several facilities in the Baltic States for production of biofuels and shale oil. Accumulated experience of biofuel production, existing and developing capacities of their production and expected international trends would support the implementation the EU objectives. Increasing consumption of biofuels will increase energy security of the Baltic States, and has also a potential to reduce harmful impact from transport on environment.

In order to enhance strategic reliability of the supply of the liquid fuels it is necessary:

- 1) To maintain the diverse structure of the liquid fuels market in the Baltic States;
- 2) To develop biofuels and non-conventional energy sources;
- 3) To build up efficiently the mandatory stocks of liquid fuels.

VII. ENVIRONMENTAL PROTECTION

In the energy sector the Baltic States will comply with the international environmental conventions, will implement requirements set in the EU environmental directives directed to reduction of the negative impact caused by energy enterprises on environment and danger for health of population. The main environmental tasks for the energy sector are as follows:

- 1) To strengthen regulation of environmental protection including the implementation in the energy sector of measures mitigating the climate change and giving priority to flexible economic levers;
- 2) To encourage energy enterprises to participate in the emissions trading in the EU trading system and in the global CO₂ markets, to introduce clean development mechanisms and joint implementation projects;
- 3) To apply flexible measures for reduction of the greenhouse gas emission into the atmosphere, to promote the use of renewable energy sources and to increase energy efficiency taking into consideration specific features and opportunities in each country;
- 4) To create clear framework and incentives for the introduction of new modern environmentally sound technologies and appropriate measures;
- 5) To develop measures directed to reduction of the SO₂ and NO_x emissions and to implement the national programmes for reduction of emissions and improvements of ambient air quality;
- 6) To promote research and development, to encourage informative, voluntary and education measures aimed at reduction of negative impact on the environment (the development of pilot projects, ecological labelling, international environmental standards, etc.).

VIII. CONCLUSIONS

Global environment for the energy sector development requires closer cooperation among the Baltic States, common energy policy and common decisions. Strategic analysis of strengths and weaknesses in energy supply, as well of potential threats will be useful for more efficient use of the available opportunities. Based on analysis performed in the Strategy appropriate measures (integration of power and natural gas systems into the EU energy systems, construction of new generation capacities, modernisation of energy systems, construction of a regional liquefied natural gas import terminal, faster utilization of justified local and renewable energy sources, increase of energy efficiency, etc.) directed to increase energy security in the Baltic States should be implemented. The Strategy could be supplemented by a corresponding Action Plan indicating the most important activities for the Baltic States.
