

ESTONIAN NATIONAL ENERGY STRATEGY

A. HAMBURG*

JSC Eesti Gaas
9 Liivalaia Str., 10118 Tallinn, Estonia

Estonian national energy strategy since 1991 is analyzed in this paper. Estonia separated from the Soviet Union in 1991 and joined the EU in 2004. The first national energy strategy was worked out in 1938. Creation of contemporary energy strategy for re-independent Estonia started in 1988. Over 90% of electricity in Estonia is generated by oil shale thermal power plants. Estonian state is the owner of strategic power plants, electrical networks and mining enterprise. In this paper a short overview of national energy development programs and state's role in forming the energy strategy is presented.

Introduction

Energy plays an important role in lives of all of us. Therefore there are very high requirements established for energy supply. Execution of these requirements requires the development of the energy sector in time and to a needed extent. The development of energy sector is a very long-term and expensive process. For that reason the choice of optimal development strategy is very important.

The first energy strategy plan for Estonia was compiled in 1938. The basic ideas at that time were the following:

- 1) To form the interconnected electrical network in Estonia. Small local power plants have to be built only to the islands or areas, where the construction of high voltage network is not profitable.
- 2) To optimize the load distribution between power plants.
- 3) The great power plants must be interconnected by transmission lines.
- 4) The distribution network must interconnect all towns and all industrial and main agricultural centres.
- 5) The price of electricity in power system must be lower than in isolated power plants.

* Corresponding author: e-mail address arvi.hamburg@gaas.ee

For the realization of that plan in 1939 the “Electricity Centre” was created, but the actual life took a different turn. After the Second World War Estonia remained the member of the USSR until 1991. During that period the Estonian energy sector was developed as a part of the power system of the USSR. Four oil shale power plants (Kohtla-Järve, Ahtme, Balti and Eesti PP) and one oil-fired power plant (Iru PP) were built. Estonian Energy System was connected with power systems of St. Petersburg, Pskov and Latvia. Estonian oil shale power plants were exploited very intensively. Since 2006 the Estonian power system is also interconnected with the Finnish power system. The main energy enterprise in Estonia is “*Eesti Energia*”.

National energy strategy programs

The planning of national energy strategy for re-independent Estonia started in 1988. From 1988 to 2007 several energy development programs have been compiled for Estonia.

1. **Estonian Energy Development Plan (until 2005). Working group “kW”. 1990.**

The first energy strategy plan for re-independent Estonia was compiled by a voluntary working group. The plan proceeded from the prognosis of energy demand and forecast of the technical progress in the entire energy sector. This report prioritized energy strategy goals and role of the state in achieving them. The main long-term targets for energy development were the following: 1) decreasing and cleaning of emissions of oil shale power plants, 2) energy saving, 3) decreasing of electricity export, 4) optimization of power system operation, 5) interconnecting of the power systems of Finland and Estonia.

2. **Energy Development Plan for Estonia (until 2030),** Estonian Academy of Sciences and Estonian National Planning Committee, 1992.

It was the first state energy development plan. The plan also treated the problems of new technology of combustion, restructuring of energy sector and research and development objectives.

3. **Energy saving Program, Ministry of Building, 1992.**

The main goals of the program were: 1) decreasing the import of fuels up to 50% compared to 1991, 2) to start using market base prices in the fuel and energy sector, 3) to promote energy saving.

4. **Research and Development Program (“Energy 2000”), Estonian Energy Institute, 1995.**

The main topics of scientific and innovative research work that have to be financed in Estonia were formulated. A Foundation of Energy Research to finance this program was recommended to be created.

5. **National Fuel and Energy Sector Development Plan. The Parliament of Estonia, 1998.**

The priority goals were: 1) quality and stability of energy supply, 2) independence of energy sector, security reserves, 3) energy saving, 4) execution of environmental requirements.

6. **National Fuel and Energy Sector Development Plan until 2015 (2030). The Parliament of Estonia, 2004.**

The main decisions: 1) the state will create conditions for continuous development of fuel and energy sector, 2) the presence of local electricity production capacities for covering annual load curve will be guaranteed permanently, 3) liberalization of the energy market and development of the free market will continue, 4) the new taxation system of environment and energy will be introduced, 5) the renovation of Narva Power Plants will continue, 6) the share of peat, wood and wind in the primary energy balance sheet will increase, etc.

7. **Electricity Industry program, Government of Estonia, 2005**

The program specifies the plan of electric generation capacity until 2015. The main attention is paid to the renovation of condensing power plants, to the use of gas turbines and alternative energy resources.

The first Energy Act was passed in 1997. In 2003 this act was transformed into the Electricity Market Act. Estonia decided to join the European Union in 1995 and joined the EU in 2004.

Fuel Committee was founded in 1988 and the State Energy Office in 1990. The office started to operate in 1991.

In 1998, the Estonian Energy Market Inspectorate and the Estonian Technical Inspectorate were founded.

Goals of state energy strategy

The main goals of state energy strategy are as follows:

1. To guarantee continuous energy supply with suitable prices
2. To guarantee the development of energy technology
3. To guarantee the reliability and security of energy systems [1]
4. To guarantee the quality of energy [2]
5. To guarantee the increasing of energy consumption efficiency and to promote energy saving
6. To develop free competition and energy markets [3]
7. To foster the use of alternatives energy resources
8. To discharge the environmental requirements
9. To develop cooperation between power systems interconnected with the national power system [4]
10. To develop education and research in the field of energy.

For achieving these goals the state uses legislation, long-term development plans, energy policy and owner's rights. The role of the state is very important in a small state such as Estonia.

A small state has an advantage of being flexible, ready for fast changes. The government of each state, especially of a small one, must create conditions for the growth of the GNP, a beneficial environment for business activities and good living conditions. The infrastructure, especially the fuel and energy sector, is the basis for the development of production and business activities as a whole. During its long history Estonia has made good use of this advantage and developed its potential. In long-term planning of power systems and the whole energy policy the state has to play a determining role, forecasting the economic development and environmental changes as a whole. Considering the needs and possibilities of the society it is necessary to deal with long-term development planning (30-40 years) of the fuel and energy sector. The long-term (30-40 years) energy development plans must also include the following items [1]:

1. Regulation – control over the enterprises that have a dominant position. For this purpose the state has regulatory and control mechanisms. The market regulator has the central position and it is more complicated for the state to perform its role [2]
2. Innovation – support mechanisms for new ideas, research and development, technology transfer [3]
3. Energy efficiency – sustainable development and utilization in energy production, transmission and consumption

The implementation mechanism of the state for these parts works through legislation.

Main directions of development of fuel and energy sector in Estonia:

1. To continue the development of oil shale power plants on the fluidized bed combustion (FBC) technology
2. To develop mining technology
3. To take into use the gas turbines for covering peak loads and emergency reserves
4. To foster the building of new cogeneration power plants and the use of alternative energy resources
5. To develop energy networks
6. To develop education and scientific research in the area of fuel and energy sector
7. To improve the cooperation between Baltic and Nordic states in the area of fuels and energy [5]
8. To work out a national security plan for the entire fuel and energy industry
9. To re-establish the State Energy Office.

Conclusions

1. National energy strategy and executing this into practice are very important problems requiring complementary research work.
2. Development of energy sector depends on the above-mentioned strategy and a large number of other factors such as:
 - Economical development
 - Reforms in energy sector
 - Development of new technologies
 - Development of the regional and international energy markets
 - Environmental requirements etc.

REFERENCES

1. *Lai, L. L.* Power system restructuring and deregulation. – John Wiley & Sons Ltd, 2001.
2. *Lipo, T.* Power Electronics & Power systems. – Kluwer Academic Publishers, 1988.
3. *Denny, F. I., Dismukes, D. F.* Power system operations. Electricity markets. – CRC Press, 2002.
4. *Berri, T. W.* Electricity economics and planning. – Peter Peregrinus Ltd., 2002.
5. *Villemas, J.* Forecast of electricity demand and supply in the Baltic States. – Dubingai, 2005.

Received April 24, 2007