LITHUANIAN ENERGY STRATEGY AND ITS IMPLICATIONS ON REGIONAL COOPERATION

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Introduction

Since the first days of Lithuania's independence, energy security has been one of the most sensitive issues of economic and political survival of the state. Lithuania regained independence in 1990 and was immediately punished by the Soviet Union via an energy blockade. The leaders of the Soviet Union were confident about Lithuania's incapacity to develop a self-sufficient economy and believed that Lithuania would be forced to return. From 20 April to 2 July 1990, Lithuania was completely cut off from oil and fuel supply. This blockade had a very destructive effect on the Lithuanian economy. By the time of official international recognition of Lithuania's independence, it was clear that great attention should be paid on energy security.

However, even after 18 years of independence, Lithuania is still vulnerable because of dependence of the energy sector on Russia. Although the Soviet Union no longer exists, Russia is not afraid to use energy supply as an instrument of warning or punishment. Since 1990, Lithuania has faced several disruptions of energy supply. The most alarming of them occurred recently, when on 18 February 2004, the gas supply was interrupted to Lithuania as a consequence of the Russian–Belarusian conflict. During two days, Lithuania was offered to use only 5 of a needed 12 million m^3 via the reserve pipeline from Latvia. On

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29 July 2006, the Druzhba branch-line to Mazeikiu nafta, the only oil refinery in the Baltic States, was closed. Although Russia has repeatedly stated that the pipeline is closed exclusively for technical reasons, there is little doubt that this action was taken as a political reaction on selling shares of Mazeikiu nafta to a Polish and not Russian company. Since that time, oil is transported only through the Butinge oil terminal by sea.

The above precedents confirm the existence of threats on the Lithuania's energy sector. Lithuania does not possess hydrocarbon resources of energy and only a small part of its needs can be fulfilled by domestic resources. Lithuania has developed and modified the energy strategy several times since 1990, and has initiated some ambitious projects, but until now Lithuania as well as Latvia and Estonia remain as "energy islands" in the EU. The energy infrastructure of the Baltic States is more integrated with Russia than with the EU.

Lithuania's energy sector is rather specific and very sensitive and vulnerable to external pressure. The keystone of the energy sector is formed by the Ignalina Nuclear Power Plant and the oil refinery Mazeikiu nafta. Lithuania will face radical transformation of the whole energy sector by the forthcoming closure of the Ignalina Nuclear Power Plant in 2009. Unfortunately, Lithuania is not sufficiently prepared for this and will encounter a real shock by increasing cost of electricity and demand for natural gas import. This will also imminently increase dependence on the Russian Gazprom.

The operation of Mazeikiu nafta also has a tremendous influence on Lithuania's economy. Mazeikiu nafta is the biggest company by revenue in Lithuania. In 2007, its revenue was 8.814 billion LTL (2.554 B EUR); and during the nine months of 2008, it reached 14.4 B LTL (4.17 B EUR)[2]. The performance of the company is important for the state budget and the GDP, and hence Russian attempts to disrupt its operation have direct impact on Lithuania's economy.

With the aim to reduce the vulnerability of the energy sector the Lithuanian Government has initiated several regional projects, among which the most important are a new Nuclear Power Plant in Lithuania (together with Poland, Latvia and Estonia) and energy links to Poland and Sweden. It is also planned to implement several other projects to modernise other power plants, to increase efficiency of energy

[2] AB Mažeikiu nafta. *Annual Report 2007*. 2008, p. 66, http://www.nafta.lt/get_file.php?id=159; AB Mažeikiu nafta. Mazeikiu Nafta Reports Operations Results for Nine Months, News release, 13 November 2008, http://www.nafta.lt/en/main/news/news?id=5657

consumption and to extend consumption of indigenous and renewable energy resources. Many of those projects are still in the preparation stage, and it is obvious today that only close cooperation with other states in the region can result in their successful implementation.

Lithuania's energy sector: current situation

Energy dependence and consumption trends

In the recent few years, the structure of Lithuania's energy consumption shifted towards natural gas. Compared to 2004, when 36 per cent of all energy needs were covered from nuclear sources (Ignalina nuclear power plant), in 2007, the main primary energy sources became natural gas, imported exclusively from Russia. This increased economic dependence on imported energy resources. Lithuania has no substantial indigenous or renewable energy resources and domestic and renewable sources meet only 11.2 per cent of the demand (see Fig. 1). Bearing in mind that nuclear fuel and the larger part of oil is imported from Russia diversification of flows of energy resources is a priority for the Lithuanian Government.

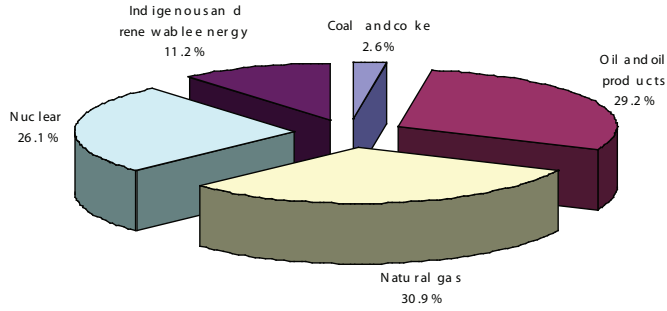

Figure 1. **Gross consumption of primary energy sources in Lithuania, 2007.**

Source: Department of Statistics, Government of the Republic of Lithuania, *Energy Balance 2007*. Vilnius, 2008, p. 47

Total energy consumption is often estimated as million tonnes of oil equivalent (Mtoe). In 2006, the primary energy consumption in Lithuania was 8.60 Mtoe and the final energy consumption — 4.766

Mtoe.[3] The final energy demand has been increasing in Lithuania since 2000 but still has not reached the 1990 level.

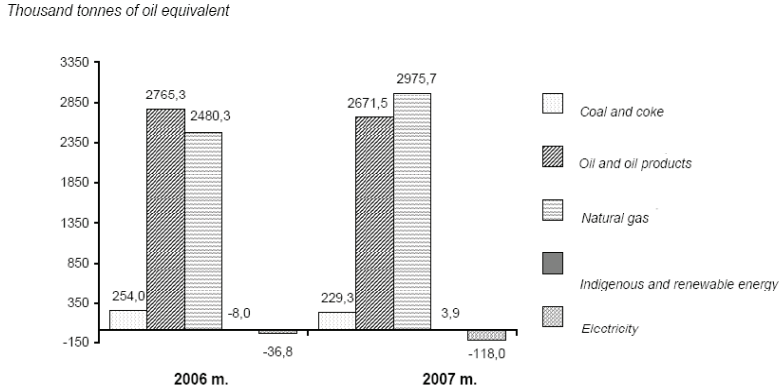

Figure 2. **Net fuel and energy imports 2006–2007.**

Net imports = imports – exports.

Source: Department of Statistics, Government of the Republic of Lithuania. *Energy Balance 2007*. Vilnius, 2008, p. 48.

Currently, the final energy balance is dominated by the household and transport sectors consuming over 60% of the energy supplied to the final consumers. During the period 2000–2006, energy consumption rose rapidly (5.2% per annum) in the manufacture sector increasing its share in final energy balance to 21%.[4]

The National Energy Strategy of Lithuania presents three final energy consumption trends, which depend on the economic growth rate: 1) fast economic growth scenario, 2) basic (most likely) scenario, and 3) slow economic growth scenario. The basic scenario is based on the most likely economic development trends, assuming a GDP growth rate of 5% until 2015, and 4% after 2015 (average 4.5% during the period from 2005 to 2025).[5] According to the basic scenario, Lithuania's final energy consumption will reach 5 Mtoe in 2010 and 7.4 Mtoe in 2025 (see Table 1).

[3] Department of Statistics to the Government of the Republic of Lithuania. *Energy Balance 2007*. Vilnius, 2008, p. 12.

[4] Lithuanian Energy Institute. *National Energy Strategy (with commentaries).* Vilnius, 2008, p. 30.

[5] *Ibid*., p. 28.

Table 1. **Forecast of final energy demand in Lithuania**

Year	Slow growth scenario	Basic scenario	Fast growth scenario
	Energy demand, Mtoe		
1990	9,7	9,7	9,7
1995	4,6	4,6	4,6
2000	3,7	3,7	3,7
2005	4,5	4,5	4,5
2010	4,8	5,0	5,4
2015	5,2	5,7	6,5
2020	5,7	6,5	7,9
2025	6,2	7,4	9,5
Index (1990 = 100)			
1990	100	100	100
1995	47,5	47,5	47,5
2000	38,7	38,7	38,7
2005	46,4	46,4	46,4
2010	49,6	52,1	56,0
2015	54,0	59,1	67,5
2020	58,7	67,2	81,3
2025	63,9	76,6	97,9

Source: Lithuanian Energy Institute. *National Energy Strategy (with commentaries),* Vilnius, 2008, p. 31.

Oil sector: the lost status of a transit country

Dependence on Russian oil and gas has been a hot issue since the restoration of Lithuanian independence and the subsequent energy blockade from Russia in 1990. The energy blockade created an urgent need to build capacity for provision of import oil from other countries. Lithuania has learned its lesson from Russia and today participates in the oil sector not only as a final consumer but also as mediator in refining and transportation processes.

The strategic decision to build the Butinge oil terminal was taken after the oil blockade in 1990. It was decided to import oil by alternative routes and the Butinge terminal was considered to be the main instrument to circumvent energy blockades. The terminal cost Lithuania 350 million USD, but has paid off already as it is an important element of the oil

export system (Table 3). The reversible export and import oil terminal on the Baltic seacoast operates all year and can export 14 million tonnes of oil annually. Butinge import capacity was planned at 6 million tonnes of oil per year but recent improvements have built import capability. Since July 2007, Butinge has operated mainly primary as an oil import channel to provide the needs of Mazeikiu nafta. In 2008, 9.07 million tonnes of crude oil were handled in the Butinge terminal[6], almost all consumed at the Mazeikiai refinery.

Until 2007, Russian oil from Polotsk to Butinge was transported by a branch of the Druzhba pipeline through the Mazeikiai refinery (Fig. 3). Oil and its products from Mazeikiai by railway are also transported to Klaipeda oil terminal, which at the same time can serve as a strategic oil import port.

Figure 3. **Oil supply and refining in Lithuania.**

Source: Lietuvos energetikos istitutas. *Nacionalinė energetikos strategija*. Vilnius, 2003, http://www.lei.lt/_img/_up/File/atvir/leidiniai/energ.pdf

The designed capacity of Mazeikiu nafta, the only refinery in the Baltic States, is 15 million tones of crude oil per year. The year 2007 was very difficult for Mazeikiu nafta, as it had to shift to new (or forgotten old) routes of import crude oil. This and an accidental fire in autumn 2006

[6] Klaipėda Sea Port. Review of cargo turnover in Klaipėda and neighbouring ports during January-December 2008, 2009, http://www.portofklaipeda.lt/en.php/statistics/recent_statistics/8150

caused a sharp drop in refined oil in 2007. However, in 2008, Mazeikiu nafta planned to reach its typical production rates. In nine months of 2008, Mazeikiu nafta reported refined amounts of 7.244 million tonnes of feedstock, including 6.962 million tonnes of crude (Table 2).[7]

Table 2. **Refined oil at the Mazeikiu Nafta oil refinery**

	2001	2002	2003	2004	2005	2006	2007	2008 I–III quarters
Refinery intake (M t)	6.8	6.6	7.2	8.7	9.2	8	4.7	7,2

Sources: Department of Statistics to the Government of the Republic of Lithuania. *Energy Balance 2007*. Vilnius, 2008; AB Mažeikiu nafta *Metinė ataskaita 2006* (Annual Report 2006). 2007, p. 20. http://www.nafta.lt/get_file.php?id=111

The third major constituent of Lithuanian oil sector is Klaipedos Nafta, which owns the Klaipeda oil terminal. It operates light and heavy oil product storage tank farms and railway trestles. Oil products from Mazeikiu nafta, Russian and Belarusian oil refineries, as well as Russian and Kazakhstan crude oil are exported via this terminal (Table 3).

Table 3. **Shipment of oil and oil products through the Port of Klaipeda and Butinge oil terminal in 2002–2008** (mln tonnes)

	2002	2003	2004	2005	2006	2007	2008
Port of Klaipeda (oil and oil products only)	6.681	6.640	6.429	5.783	6.772	7.139	9.36
Butinge oil terminal	6.07	10.72	7.24	6.13	5.89	4.58	9.07

Source: Klaipėdos valstybinio jūrų uosto direkcija. Klaipėdos valstybinio jūrų uosto 2007 metų krovos darbų ataskaita, 2008 [The report of port of Klaipėda on cargo in 2007]. http://www.portofklaipeda.lt/admin/files/get.php?id=442
Klaipėda Sea Port. Review of cargo turnover in Klaipėda and neighbouring ports during January–December 2008, 2009. http://www.portofklaipeda.lt/en.php/statistics/recent_statistics/8150

[7] Mažeikiu nafta. *Mazeikiu Nafta Reports Operations Results for Nine Months,* 2008 November 13. http://www.nafta.lt/en/main/news/news?id=5657

The development of the oil sector in Lithuania has proved one simple principle — mediation in the energy sector (participation in transit and process of refining) strengthens security and economically is more useful than being just a consumer. The dependence of Lithuania from Russian oil has not decreased (because import from other countries is too expensive) as the Butinge oil terminal handles mainly Russian oil shipped through the Primorsk terminal.[8] However, mediation has helped to seize the advantages that were available. The Butinge oil terminal became an important source of revenue for Lithuania's state budget and economy and at the same time raised the value of the whole oil system. The involvement in Russia's oil transit made the Lithuanian oil sector attractive for foreign investors and as a result PKN Orlen became the primary owner of Mazeikiu nafta in 2007. However, the oil transit business has proved to be unreliable because of Russia's political attitude toward Lithuania.

Gas sector: the most vulnerable link

Lithuania's politicians, economists and national security experts underline that the gas sector is the most vulnerable field in the energy sector, as Lithuania does not participate in gas transit and acts only as a consumer of Russian Gazprom gas. The need for gas is increasing and after the decommissioning of Ignalina's Nuclear Power Plant the demand should almost double. In 2006, all gas was imported from Gazprom, a total of 3.1 million m^3. The gas import is mainly operated by three enterprises: AB Lietuvos dujos, UAB Dujotekana and AB Achema.

Lithuania's dependence on Gazprom policy is regulated by the following factors[9]:

- *The only gas supplier to Lithuania is Gazprom.* As a consequence, Lithuania lacks alternative choices to Gazprom's demand to pay 500 USD for 1,000 m^3 of gas or even more. From the beginning of 2006, Gazprom started to gradually raise prices for gas sold to Lithuania. From 1 January 2006, the price of natural gas imports to Lithuania rose by 63%, as compared with 2005, and from 1 January 2007 — by

[8] In 2007 and 2008, some test shipments of Venezuela and other countries were handled but the main flow remains from Primorsk.

[9] Adopted and modified from: Janeliūnas, Tomas, Molis Arūnas. "Energy Security of Lithuania: Challenges and Perspectives". *Lithuanian Political Science Yearbook 2005*. Algimantas Jankauskas (ed.). Vilnius, 2007, pp. 208–209.

another 47%. At the beginning of 2007, the cost of gas import was 2.4 higher compared with 2005. According to the National Control Commission for Prices and Energy, the price even rose during this year — in August 2008, Lithuania already paid 515 USD for 1,000 cubic metres.[10] In the second half of 2008, oil prices dropped sharply and this should lower gas prices as well, but only as a short relief.

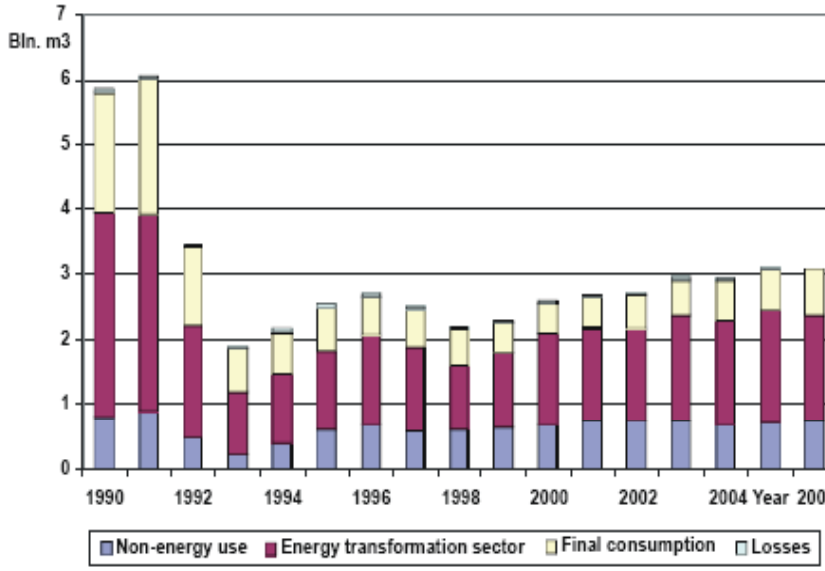

Figure 4. **Dynamics of natural gas consumption.**

Source: Lithuanian Energy Institute. *National Energy Strategy (with commentaries),* Vilnius, 2008, p. 46.

- *Natural gas is transported to Lithuania only via the Minsk–Vilnius–Kaliningrad pipeline, which is controlled by Gazprom*. The system of Lithuania's gas pipelines is not integrated into the European network or any alternative extraction zone. Therefore, there is no opportunity to supply Lithuania with gas from alternative sources. In emergency cases an alternative route is the link with the Latvian gas system, but its capacity cannot meet the typical Lithuanian demand. (Fig. 3)

[10] Laukaitytė, Rasa. „Lietuva už dujas jau moka brangiau nei „Gazprom" žada parduoti Europai". 2 October 2008 [Lithuania already pays for gas more than Gazprom intends to sell for Europe]. http://www.delfi.lt/news/economy/energetics/article.php?id=18742907

- *Gazprom is one of the biggest stockholders of the main Lithuanian gas operator Lietuvos dujos*[11]. This means that Lithuania does not have any chance to implement policy that would contradict the interests of Gazprom (e.g. raise transit tariffs or block gas supply for Kaliningrad).
- *There are no gas storage facilities in Lithuania.* Lithuania does not have capacity to store natural gas and use the reserves when this is necessary. On the other hand, if such a gas storage facility would be built, the main shareholder would be Gazprom and its partner E.ON Ruhrgas International.
- *Lithuania does not have capacity to deliver, recast or store big quantity of liquid natural gas (LNG).* Thus, Lithuania can not buffer any perturbation of the gas supply.

Figure 5. **Lithuania's gas system.**

Source: Adapted by the author

Electricity sector: before and after 2009

The electricity sector earlier was the strongest and most efficient element in the Lithuania's energy system. The Ignalina Nuclear Power

[11] Gazprom has 37%, its main partner in Western Europe E.ON Ruhrgas International AG possesses 39%, and 18% is left for the Lithuanian Government.

Plant (Ignalina NPP) had capacity exceeding Lithuania's demand and this provided the opportunity to export electricity. In 2005, electricity sale abroad by Lietuvos Energija AB amounted to 4.03 TWh. Due to closure of the first unit of the Ignalina Nuclear Power Plant electricity exports fell by 45% by the end of 2004. Lietuvos Energija AB exported electricity to Latvia, Estonia, Belarus, Kaliningrad Region of Russian Federation and continental Russia.

The main source of electricity in the country until now has been the Ignalina NPP, as it produces less expensive electricity than thermal power plants using fossil fuel. Even with one unit operating (after 2005) Ignalina NPP generated and supplied 7.9 TWh, and Lietuvos Energija AB exported 2 TWh of electricity. As a result of the successful export and import policy of Lietuvos Energija AB (cheaper electricity was imported from Russia during 80 days of repairs at Ignalina NPP), electricity production costs in the country increased insignificantly in 2006 — only by 0.5%[12]. However, since then, preparation for decommissioning of the Ignalina NPP and scheduled or accidental disruptions of the second unit operation at Ignalina NPP Lithuania resulted in a need to import electricity from Russia.

Table 4. **Installed capacity of power plants in Lithuania (2006)**

Power plant	Installed capacity, MW
Lithuanian Power Plant	1800
Vilnius CHP	384
Kaunas CHP	170
Petrašiūnai CHP	8
Mažeikiai CHP	160
Klaipėda CHP	11
Other thermal power plants	108
Ignalina NPP	1300
Kruonis HPSP	900
Kaunas HPP	101
Small HPP	27
Wind PP	49
Total	**5018**

Source: Lithuanian Energy Institute, Ministry of Economy. *Lithuanian Energy Strategy 2008.* V. Miškinis, A. Galinis, J. Vilemas (eds.). Vilnius, 2008, p. 36.

However, after 2009, Lithuania will face a big challenge arising from the decommissioning of the second unit at Ignalina NPP. Then the

[12] National Control Commission for Process and Energy. *The Annual Report on Electricity and Natural Gas Markets in Lithuania to the European Commission 2007.* Vilnius, 2007, p. 13.

Lithuanian Power Plant will become the major electricity production source. However, as stated in the National Energy Strategy, the price of electricity produced by the existing generating units of the Lithuanian Power Plant (and other smaller power plants using natural gas) will not be competitive in the market. It should be remembered that the demand for natural gas after 2009 will increase at least by 75 per cent. [13]

In 2005, the average electricity production cost was about 8.44 Lithuanian cent/kWh (2.45 eurocent/kWh) and the average electricity cost for the final consumer was about 23 Lithuanian cent/kWh. (6.67 eurocent/kWh)[14]. Taking into account the decommissioning of Unit 2 of the Ignalina NPP the average electricity production cost in 2010 is expected to increase more than twice and the average electricity cost to the final consumer is estimated at 69 Lithuanian cent/kWh (20 eurocent/kWh).[15] This cost is estimated assuming a scenario of no imported electricity from abroad.

Such a large increase in the electricity price will hit Lithuania's economy rather hard. That was the reason why Lithuanian politicians attempted to communicate with the European Commission on extension of operation of Ignalina NPP until alternative power plants are modernised and energy links with Poland and Sweden are constructed. However, the repeated response of the European Commission to Lithuania was adherence with the Membership Treaty regarding time of Ignalina NPP closure.

Perhaps the biggest problem in the Lithuania's electricity sector is the absence of energy links with Poland and Sweden. Those projects are necessary to ensure that Lithuania will face no shortage of electricity after 2009. Presently, Lithuania can import electricity only from Russia or Belarus, and there is no guarantee that Lithuania's import demands will be met. There can be technical obstacles (e.g. shortage of electricity in neighbouring regions or limited capacity of electricity networks) as well as political motivation that could force Lithuania to utilize only its own capacity.

Therefore, as stated in the National Energy Strategy, it is necessary to build capacity by improving efficiency of CHP plants including the Lithuanian Power Plant and to reduce the price of electricity generated

[13] Lithuanian Energy Institute, Ministry of Economy. *Lithuanian Energy Strategy 2008.* V. Miškinis, A. Galinis, J. Vilemas (eds.). Vilnius, 2008, p. 14. http://www.ukmin.lt/lt/veiklos_kryptys/energetika/bendrieji_dokumentai/doc/Ataskaitos2007/NES_kom_liet.pdf

[14] *Ibid*., p. 34.

[15] However, even those numbers may be not precise because the constant price of natural gas was included in the calculations and the situation has been changed since that.

by the Lithuanian Power Plant. By 2010, the Lithuanian Power Plant is planned to have a combined cycle gas turbine unit with a capacity of up to 400 MW installed (investment estimated at LTL 720 million or 210 million EUR), inefficient units of 150 MW capacity closed, as well as minimisation of the use of natural gas by substituting petroleum products for natural gas in other units.[16] However, there is some doubt regarding completion before the beginning of 2010.

The biggest hope for eventual energy security in Lithuania focuses on the construction of a new nuclear power plant, developed together with Poland, Latvia and Estonia. The National Energy Strategy envisages completion of the plant by 2015, but project development is delayed and it is clear that the nuclear power plant can be completed only by 2017 or even by 2020. The supervision of the construction will be carried out by a Lithuanian national investor (the so-called "national champion") Leo Lt, formed by the state-owned electricity transmission system operator Lietuvos energija AB, electricity distributor Rytu skirstomieji tinklai (RST) AB and private electricity distributor Vakaru skirstomieji tinklai (VST). The process of forming the national champion has evoked much discussion and controversy. Critics of the national champion are arguing that the government is protecting interests of private investors more that public interest. Even now after official procedures and legislation has been enacted, some political parties are attempting to review the entire process and hamper the work of Leo Lt.

Lithuania's energy strategy

The main principles and priorities of energy strategy 2007

The new National Energy Strategy was approved by the Lithuanian Seimas on 18 January 2007, replacing the old strategy adopted in 2002. The demand for the newly formulated strategy rose after joining the EU and the increasing dependence on Russian energy resources. The ensuing closure of the Ignalina nuclear power plant was a big challenge that could not be ignored and required reconsideration in view of the impact on the whole energy sector. The recent changes in global energy trends, energy prices, the problems posed by global climate change and the impact thereof on a long-term global energy outlook also

[16] *Lithuanian Energy Strategy 2008, op. cit.,* p. 37.

demanded new reaction from the Lithuanian Government. However, some old problems were reiterated in the redrafted strategy. Lithuanian Government and lawmakers admitted that not all objectives given in 2002 have been implemented, specifically:

- Lithuania's electricity networks were still not interconnected with Poland's networks;
- Insufficient progress has been made towards increasing the reliability of natural gas supply;
- Modernisation of the heat sector has been too slow, hence an excessive amount of energy is still consumed for the heating of buildings, the condition of a large number of heat supply pipelines is critical, and the probability of large-scale accidents is high.

The new National Energy Strategy "defines the main targets set by the [Lithuanian] 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".[17]

The National Energy Strategy sets three main priorities (strategic objectives):

1) To seek comprehensive integration of Lithuania's energy systems, especially the electricity and gas supply sectors, into EU systems and the EU energy market;
2) 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 generation energy production will not exceed 30% in Lithuania's annual fuel balance;
3) To improve the efficiency of energy use and to save energy consumption.[18]

It should be mentioned that, besides very specific, Lithuanian-oriented objectives, the strategy contains EU requirements or obligations meeting EU directives and recommendations. Therefore, some strategic objectives drafted in the Strategy appear as if copied from official EU documents without specific considerations about the Lithuanian

[17] *National Energy Strategy.* Approved by Resolution No X-1046 of the Seimas of the Republic of Lithuania of 18 January 2007, p. 3.
[18] *Ibid*., p. 5

situation. This is particularly apparent regarding European focal issues such as efficiency of energy use, European environmental requirements in the energy sector, and use of renewable energy resources or bio-fuels. The main body of the strategy quite clearly follows EU directions or seeks to reach some EU averages. Even the section named "Lithuania's interests and tasks shaping the EU energy strategy" sounds more likely a repetition of some EU strategic thoughts rather than exclusively Lithuanian needs. Thus, the Lithuanian National Energy Strategy appears as if driven by the EU energy strategies, at least to some extent.

The most important objectives in the Lithuanian National Energy Strategy can be summarised as follows:

New energy facilities or infrastructure objects:

1. To establish 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;
2. Not later than by 2012, to connect Lithuania's high tension electricity networks with the networks of Scandinavian countries and Poland;
3. 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 encompassing the Lithuania, Poland and Latvia interests, and taking into 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.[19]

Diversification of energy use and increasing efficiency:

1. To increase the share of renewable energy resources in the national balance of primary energy at least up to 20% by 2025;
2. To increase the share of the electricity produced by combined heat and power plants during the heating period in the national balance of electricity generation up to 35% by 2025; to increase

[19] *National Energy Strategy, op. cit.,* p. 12.

the share of biofuel in the market for fuel used in transportation up to 15% by 2020 and up to 20% by 2025[20];

3. To save 9% of final energy over the period of 9 years (starting form 1 January 2008), in comparison with the level of final energy consumption in 2005;
4. To further improve the efficiency of consumption of all types of energy, so that in 2025 relative energy consumption in buildings, various equipment and devices, technological processes and transport systems approaches the indicators of developed EU states.[21]

Environmental targets:

1. To reduce greenhouse gas emissions by 8%, compared with that in 1990;
2. To reduce the emissions of the following gases by the following amounts by 2010, compared to those in 2004: CO_2 — by approximately 32% (3.9 million tonnes) annually, SO_2 — by 3% (1 thousand tonnes) annually, and NO_x — by nearly 21% (10 thousand tonnes) annually.[22]

Despite several specific and clear targets, the strategy is also full of normative "wishful thinking" (e. g. "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"). However, the most problematic part of the strategy regards forecasting general economic trends for Lithuania, energy demand and energy prices. It should be noted that the very principal of including forecasts in the strategy is quite ambitious and welcome. Until now, this element of strategic planning was absent in most Lithuanian strategic documents or provided only in rudimentary form. However, it must be admitted

[20] This goal goes beyond the EC target of 10% of biofuels in the transport sector by 2020. However, the European Environment Agency (EEA) Scientific Committee recommends that the EU target to increase the share of biofuels used in transport to 10% by 2020 should be suspended. In 2003, the Biofuels Directive set the objective of replacing 2% of vehicle fuel supply by 2005 and 5.75% by 2010. The 2005 target was not met and according to the EEA it seems unlikely that the 2010 target can be reached. The Lithuanian Programme for Biofuels Consumption 2006–2010 still kept the target of 5.75% by 2010. However, there are no other guidelines in official documents about further steps beyond 2010.

[21] *Ibid.*, p. 13.

[22] *National Energy Strategy, op. cit.,* p. 33.

that just a year after passing the National Energy Strategy at least some of the drafted forecasts seem erroneous.

Firstly, there was a very optimistic view on market price of oil and gas. Some major projections in the Strategy were based on the assumption that "beginning with 2007–2008, oil prices would stabilise, gradually start to decline, and fluctuate between USD 50 and USD 55 per barrel after 2010."[23] In view of this modelled trend, it was concluded that, despite a huge increase in gas prices[24] "it seems likely that the stabilisation of oil prices would contribute to the stabilisation of the respective price of natural gas imports".[25]

However, the recent trends are quite opposite. The gas price for Lithuania in early 2008 reached 420 USD. As Gazprom's chief executive Miller said, by forecasts of Gazprom, the average European price could reach more than 500 USD per thousand cubic meters by the end of 2008.[26] However, Lithuania reached this target even sooner — in August 2008, the price for gas was about 515 USD. The rapid drop of oil prices in the second half of 2008 was not reflected in the price of gas until the end of 2008.

As a result of quite optimistic forecasts on prices of imported resources the costs of electricity were also miscalculated. As stated in the strategy "taking into account the decommissioning of Unit 2 of the Ignalina NPP and the forecasted rise in the natural gas price, the average electricity generation cost in 2010 could stand at 16 Lithuanian cent/kWh, and the price for the final consumer could go up by 39% and amount to 32 Lithuanian cent/kWh" (9.27 eurocents/kWh).[27] This forecast was modified by the Lithuanian Energy Institute start the at of 2008 when a new study about the implications of decommissioning of Ignalina NPP was drafted. It was concluded that the worst case scenario predicts

[23] *National Energy Strategy, op. cit.,* p. 18.

[24] In 2005, the price of gas import stood at about USD 84 per 1,000 m^3, and rose from USD 125 to USD 145 per 1,000 m^3 in 2006. In 2007, the natural gas price in Lithuania will close in on prices in Western Europe and amount to USD 220 per 1,000 m^3.

[25] *National Energy Strategy, op. cit.,* p. 18.

[26] Interfax. „European gas price could top $500 by the end of 2008 – Gazprom", Moscow, 8 July 2008. http://www.interfax.com.ua/en/news/main-news/149770/

[27] *National Energy Strategy.* Approved by Resolution No X-1046 of the Seimas of the Republic of Lithuania of 18 January 2007, p. 18.

69 cent/kWh (20 eurocent/kWh) for the final consumer in year 2010[28] (and even that scenario was based on constant gas prices).

The Lithuania's National Energy Strategy was drafted in response of urgent need to prepare the energy sector for transformation after the decommissioning of Ignalina NPP and to expedite regional projects designed to increase diversification of Lithuanian energy import capacity. However, miscalculation of energy trends and unpreparedness to implement the short-term tasks may cause difficulty in reaching the strategic goals. Having in mind all these shortcomings the new government of Lithuania has plans to draft a new version of the strategy in 2009–2010.

Strategic thinking and practical implementation of strategic tasks

Perhaps the main problem of strategic planning in Lithuania and particularly regarding the forthcoming challenges in the energy sector is the lack of strategic thinking among politicians and gaps among strategic documents and implementation of strategic tasks. The unpreparedness for the closure of Ignalina NPP is the most obvious confirmation of this.

It was known, at least in 2002 when negotiations between Lithuania and European Commission on EU-membership were concluded, that the second reactor of Ignalina NPP had to be decommissioned. The main issue of discussion was focused on decommissioning and the EU contribution in this process. However, even after closure of the first reactor of Ignalina NPP in 2004, there were no real steps taken to prepare alternative ways of producing electricity after 2009.

On 27 February 2006, in Trakai (Lithuania) the Prime Ministers of the three Baltic States signed a Declaration on Security of Supply in the Baltic States and Common European Energy Policy[29]. It was mentioned in the Declaration that the closure of the Ignalina Nuclear

[28] Lithuanian Energy Institute, *VĮ „Ignalinos Atominė Elektrinė" eksploatavimo nutraukimo pasekmių Lietuvos ekonominiam saugumui nuo 2010 m. įvertinimo studija* [The evaluation study on consequences of Lithuanian economic security due to decommissioning of the Ignalina's Nuclear Power Plant], 2008.

[29] Declaration on Security of Supply in the Baltic States and Common European Energy Policy, Trakai, 27 February 2006. http://www.urm.lt/get_file.php?file=L2RhdGEvaHR0cGQvaHRtbC91bXIvbS9tX2ZpbGVzL3dmaWxlcy9maWxlMTM4My5wZGY7RGVrbGFyYWNpamEyMDA2LnBkZjs7

Power Plant will have serious effects on the energy security of the Baltic States. On December 8 of the same year, a Joint Communique of the Prime Ministers' Council of the Baltic Council of Ministres was signed and agreement was reached regarding consultations among experts of Lithuania, Latvia, Estonia and Poland on possible cooperation on construction of a new nuclear power plant in Lithuania.[30] Tentatively, the cost of the project was projected at about 4 B euro and completion by 2015.

However, the preparation for initiating the project was delayed by the Lithuanian side and the national champion Leo Lt was officially decided only on 20 May 2008. This step allowed to move on and on 25 July 2008 in Copenhagen the heads of Leo Lt, Polska Grupa Energetyczna (Poland), Latvenergo (Latvia) and Eesti Energija (Estionia) agreed on a joint enterprise, which would be responsible for planning of construction of the new nuclear power plant.

In Lithuania there is still some doubt about the transparency of the project. Political discussions and controversy even at the first stage of the initiative were hampering the process of the preparation for this international project. The required laws were adopted only by minimal support in the Lithuanian Parliament. Some political parties are still trying to stop the process arguing that it will not be in Lithuania's national interest.

At the same time rival processes are still continuing. Lithuanian Government and political parties are still trying to convince the various institutions of the EU to allow extension of operation of the Ignalina NPP second unit. During the Parliamentary elections on 12 October 2008, a referendum was held on whether the term of the Ignalina NPP second unit should be extended after 2009. The referendum failed because of low level of attendance by voters. However, such political actions do not help to focus on the main task — rapid modernisation of old power plants, initiation of construction of energy links and a new nuclear power plant.

There are also some other irrational disputes or obstacles obstructing the path to strategic objectives in Lithuanian energy security. For example, there are many bureaucratic restrictions on the construction of wind turbines and use of the produced energy for owner needs. Electricity produced by wind power plants is required to be sold exclusively to

[30] Joint Communique of the Prime Ministers Council of the Baltic Council of Ministers,Vilnius, 8 December 2006. http://www.ena.lt/pdfai/Communique_2006.doc

distributors. This is in the interests of electricity network distributors in maintaining control over customers, but hinders expanding production by wind power plants, which would increase the share of indigenous and renewable resources in the energy balance. Lithuania has set a target to increase the share of renewable energy resources in the primary energy balance by 1.5% each year until 2012 and by 2025 to reach 20%. It is planned to construct wind power plants with a total capacity of 200 MW by 2010.[31] However, presently there are only 36 turbines (52.3 MW) in operation.[32]

There have been unsuccessful discussions with Latvia that have protracted development of the energy link project with Sweden. There is still no agreement on where the energy cable linking Sweden should be build — from Latvia or Lithuania. Until now, there is no agreement on administration of the project. All these and other unresolved questions indicate that a lack of coordination among neighbouring countries still exists. There is a common interest to cooperate in the field of energy security, but practical issues still divide the countries.

Main actors and interest groups of the Lithuanian energy sector

The Lithuanian energy market is autonomous regarding the viewpoint of the EU, but nevertheless is under the influence of interest groups. The interests of Lithuanian energy companies are similar to those of any monopoly. Although there exist formal regulations on liberalisation of the energy market (especially in the electricity sector), in practice a liberal market in Lithuanian energy sector is lacking and the most important decisions are taken by governmental regulation institutions.

However, even governmental institutions make decisions not always in line with long-term national interests or they disregard interests of consumers. Energy companies lobbies are able to guide legislation development and methods of calculation of energy prices, which are in their interests. The main argument used repeatedly by companies is the need to maintain a high profit for investment in infrastructure, and this view is supported also by the Ministry of Economy. In this situation, even the National Control Commission for Prices and Energy can do

[31] *Lithuanian Energy Strategy 2008, op. cit.*, p. 54.

[32] According to data from the Lithuania Wind Energy Association, *Installation Figures, 2007*. http://www.lwea.eu/Installationfigures.htm

little and often has to comply with general interests of energy companies. Recently in September 2008 the National Control Commission for Prices and Energy tried to change the mechanism for regulating prices of electricity regarding the upper limits.[33] However, the Commission faced strong resistance from the main public suppliers Rytų Skirstomieji Tinklai (RST) AB and Vakaru Skirstomieji Tinklai (VST) AB, as well as from the Ministry of Economy. As a result the mechanism was not changed, defending the interests of RST AB and VST AB[34].

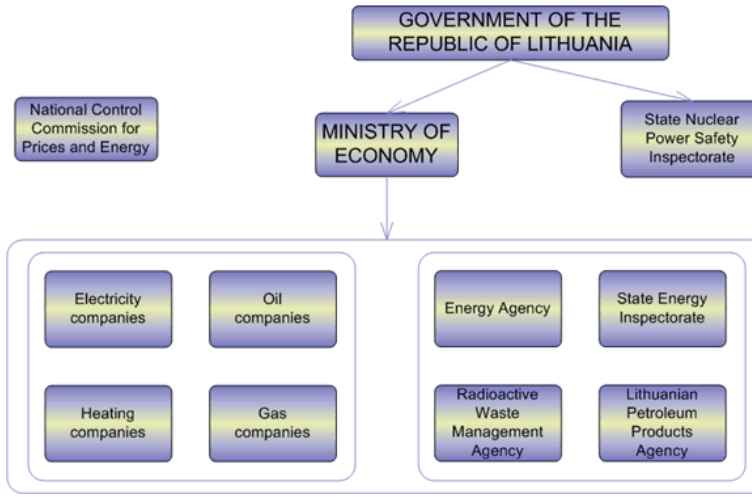

Figure 6. **Structure of the Lithuanian energy sector.**

Source: Ministry of Economy of Republic of Lithuania. http://www.ukmin.lt/en/energy/information/info.html

[33] According to the *Law on Electricity,* prices of electricity and reserve capacity sold by producers and independent suppliers are not regulated, except in cases where a producer or independent supplier has a share of over 25% in the market. The main public suppliers supplying energy upon request to all customers within their territory are Rytų Skirstomieji Tinklai AB and VST AB. In 2006, it accounted for 86% of electricity sold to domestic customers. Mažeikių Elektrinė AB is an active independent supplier with a market share amounting up to 5%. The share of other three independent suppliers that purchased the largest amount of electricity accounted for nearly 10%. See: National Control Commission for Prices and Energy. The Annual report on Electricity and Natural Gas markets in Lithuania to the European Commission 2007, Vilnius, 2007, pp. 30–40. http://www.regula.lt/index.php?-1049786789

[34] Lukaitytė, Rasa. *Kainų komisijai teismas uždraudė priimti metodiką, nurėžiančią elektros tiekėjų viršpelnius*. Delfi.lt, 29 Sep. 2008. http://www.delfi.lt/archive/article.php?id=18699015 [*The Commission for Prices was restricted by court to approve a mechanism which would limit profit of energy suppliers*].

Liberalisation of the Lithuanian electricity sector was initiated in 2002, but still could be considered nominal. On 1 January 2002, the former national electricity company Lietuvos energija was split into several independent companies, including the transmission company, two distribution companies and several production companies. The transmission company remained under state control, but privatisation of the two distribution companies and the newly established production companies was initiated. In the first stage of privatisation (in 2003) only one distribution company (VST AB) was sold to the biggest local retailer. Privatisation of the other distribution company was annulled by the Government. Similarly, only one production unit, consisting of one combined power plant, was sold (the other combined heat and power plants had passed into private hands earlier).[35]

In practice two distribution companies operate as monopolies, as they are regionally separated. These companies have a powerful influence on the Government and consumers as well. It is interesting that the private capital owned VST AB defends its interest much stronger and with bigger success than state-owned companies. This was clearly seen during the development of the national champion Leo LT. VST AB received 38.3 per cent of shares in Leo LT despite the fact that in 2003 (when VST AB was privatised) the assets of VST AB accounted for about 28 per cent of the total state-owned electricity sector. Since 2003, there have been no major investments in VST assets or infrastructure, and the capital has grown only on company balance sheets.

In the gas sector two companies dominate, which import natural gas from Gazprom: Lietuvos dujos AB (share structure: 38.9% — E.ON Ruhrgas international AG, 37.1% — Gazprom OAO, 17.7% — Lithuanian State property fund, 6.3% — small shareholders) and Dujotekana UAB (private capital). There are other importers of natural gas but they do not play a significant role in the gas sector: Achema AB and the combined heat and power plant Kauno Termofikacijos Elektrinė UAB (KTE UAB) purchase natural gas for their own needs. Natural gas to the Druskininkai region is supplied by Haupas UAB, which has a very modest share of the gas supply market (Fig. 7).[36]

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[35] Jankauskas, Vidmantas. *Development of Electricity Market in Lithuania and in the Baltics.* Vilnius, 2006. p. 4. http://www.regula.lt/index.php?-1728811190

[36] National Control Commission for Prices and Energy. *The Annual Report on Electricity and Natural Gas Markets in Lithuania to the European Commission 2007.* Vilnius, 2007, p. 16. http://www.regula.lt/index.php?-1049786789

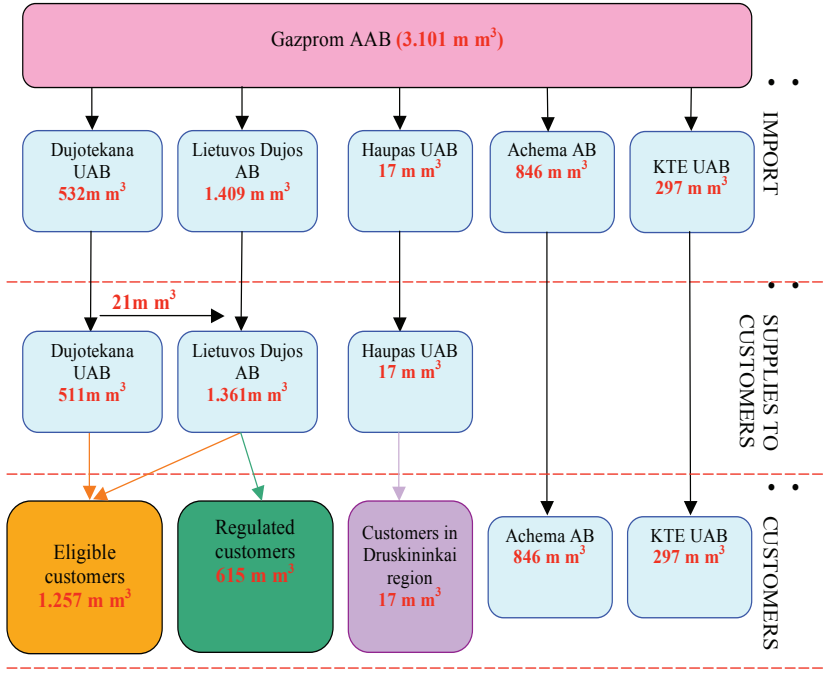

Figure 7. **Lithuanian natural gas market structure (in 2006).**

Source: National Control Commission for Prices and Energy. *The Annual Report on Electricity and Natural Gas Markets in Lithuania to the European Commission 2007*. Vilnius, 2007, p. 17. http://www.regula.lt/index.php?-1049786789

Dujotekana UAB is considered to have a significant influence on the political stage in Lithuania. The company contributed financial support for political parties and politicians, especially before the Parliament election in 2004. According to Lithuanian media, the president of Dujotekana UAB has very close ties with high-level officials and politicians. This political patronage partly explains why the Lithuanian Government considers more the interest of gas importers and distributors over ordinary consumers. The Lithuanian Government initiated proposals to end regulation of gas prices for consumers and to request an exception on implementing the so-called third energy package of the European Commission. Both initiatives were in favour of the large gas distributors of Lithuania, but not in interests of consumers or long-term Lithuanian energy security. Nevertheless, in both cases the parliament has blocked proposals made by the Government.

The administrative system does not act only in the interests of the energy companies, especially those owned by private capital. There is a check-and-balance system in Lithuania's politics and state regulation institutions (especially regarding the National Control Commission for Prices and Energy). However, the defence of consumer interests in Lithuania is still in the hands of political institutions and administered by non-governmental organisations. Lithuanian laws provide opportunities for citizens and NGO's to participate freely in the decision-making process. The extremely complicated technical issues at hand in the energy sector prevent the consistent involvement of NGO's or ordinary consumers in the decision-making process. Only a few independent experts attempt to raise issues regarding violation of consumer interests in the media. The National League for protection of consumers of gas, heating and electricity („Nacionalinė dujų, elektros ir šilumos vartotojų gynimo lyga") is one of the few non-governmental organisations monitoring the activity of energy companies, but its activities are mainly concentrated on providing information and raising public awareness of some specific issues.[37] As yet the League is not very well known in the society and has only a minor influence on political decisions.

Regional implications

Some efforts to enhance regional co-operation among the Baltic States were taken in the 1990's. Several agreements on mutual technical assistance and exchange of information were reached within the framework of the Baltic Assembly and Baltic Council of Ministers. Of particular interest is the agreement on Co-operation in the Energy Sector, which was signed by the three Ministries of Economy in Riga on 29 October 1998. The Baltic Energy Strategy (1999) has three main objectives — competitiveness, security of supply, environmental protection and safety. „These objectives are to be achieved by a set of measures comprising liberalisation of markets, price transparency, energy efficiency and interconnections."[38]

Among the many normative declarations in the first Baltic Energy Strategy, it also emphasised the need for interconnections of energy infrastructures. The Strategy stressed that "an essential measure in

[37] For example, the League is running a web site www.vartotojulyga.lt

[38] Baltic Council of Ministers, Energy Committee. *The Baltic Energy Strategy.* April, 1999, Vilnius, Riga, Tallinn, p. 2. http://www.ukmin.lt/lt/veiklos_kryptys/energetika/NES/doc/BES.pdf

improving the long-term security of supply is interconnecting the Baltic Power System to the West and North European power systems. An undersea cable connection between Estonia and Finland and a connection between Lithuania and Poland have the highest priority."[39]

However, only the connection between Estonia and Finland — ESTLINK — was completed by 2007. The Lithuanian–Polish project aimed to join the electricity networks of the two states was stalled until 2008, when the enterprise LitPol Link was established to administer the implementation of the energy bridge between Poland and Lithuania. LitPol Link will be controlled in equal parts by the national operators Lietuvos energija (Lithuania) and PSE Operator (Poland).

The impetus for this decision was given by the agreement of Estonia, Latvia, Lithuania and Poland to participate in the regional project on building a new nuclear power plant in Lithuania after decommissioning of Ignalina NPP. At the end of 2006 three energy companies of the Baltic States — AB Lietuvos Energija, AS Latvenergo, and Eesti energia AS — conducted a feasibility study on development of the new nuclear power plant project in Lithuania. It was concluded that the project could go ahead, and was substantiated from the economic, technical, environmental, and legal point of view. On 2 March 2007, the Lithuanian Prime Minister Gediminas Kirkilas and Polish Prime Minister Jaroslaw Kaczynski signed a Communiqué regarding issues of energy cooperation which, among other things, gave a green light for Poland in cooperation on construction and operation of the new nuclear power plant in Lithuania. On 4 February 2008, a joint Communiqué of the Ministers of Economy of Lithuania, Latvia, Estonia and Poland was signed, which reaffirmed the will for further cooperation in the process of preparation and development of the new nuclear power plant in Lithuania.[40]

The above mentioned agreements in 2006–2008 mark a new stage of regional cooperation between Poland and the Baltic States. Some very specific projects are anticipated, the biggest being combined effort in joining resources to initiate development of a new nuclear power plan in Lithuania. After implementation of the nuclear power plant project and through links between Lithuania and Poland, Lithuania and Sweden the electricity systems of the Baltic States will be integrated into the internal

[39] *Ibid*., p. 5.

[40] *Communique of the Ministers of Economy of Lithuania, Latvia, Estonia and Poland*. 4 February 2008, Vilnius. http://www.ukmin.lt/lt/veiklos_kryptys/energetika/informacija/doc/Communique_2008.PDF

market of the European Union and into the Union of Coordination of Transmission of Electricity (UCTE) system. However, this process is not free of suspicion, neither from the partners nor the Lithuanian domestic interest groups. The formal decisions have been made and approved but there still is reason to believe that there will be delays.

New nuclear power plant project: common interest and controversy

As already mentioned the initial idea to build a new nuclear power plant came from the three Baltic States. At the end of 2006, the three energy companies of the Baltic States conducted a feasibility study concerning implementation of the new nuclear power plant project in Lithuania. The study indicated that, given the current and forecast economic development for all three Baltic States, a significant demand and supply gap will be apparent and significant new capacity needs to be built to fill this gap.[41] The nuclear generation capacity has been considered as a possible major new source. It has been also concluded that the best possible site of the new nuclear power plant is Lithuania at the existing Ignalina site. Regarding the latest UCTE requirements and the current status of the integrated transmission systems of the Baltic States, the analysis indicated that the current infrastructure and electrical system is capable of accommodating up to 3,000 MW of nuclear capacity without major modification. But at that time the capacity of the new nuclear power plant was considered at 800–1600 MW, i.e. for the three Baltic States needs only. The possible project completion time was given as 2015 and investments needed were estimated to be 2.5–4 billion euros.

Some controversy among partners arose when at the end of 2006 the Polish side expressed the will to join the project. The representatives of Latvian and Estonian governments were concerned about the negotiations between Lithuania and Poland that were going on without being formally informed about major changes in the joint project. The reactions were very cautious.

As Estonian Prime Minister Andrus Ansip said on 30 November 2006, possible participation by Poland in the Baltic nuclear plant project has to be carefully weighed regarding all pros and cons. In this statement to reporters the Estonian head of Government said, „If we

[41] AB Lietuvos Energija. *Summarising Feasibility Study of Constructing a New Nuclear Plant in Lithuania*. 25 October, Vilnius, p. 2. http://www.lpc.lt/repository/Summary%20Report%20for%20Media_eng.pdf

take construction of the new nuclear plant as a business project, Poland's taking part in it would make the investment pay back sooner". Further, the accession of Poland also would ensure that power transmission lines between Poland and Lithuania are built faster, which would provide Estonia access to the European energy system, alongside the Estlink power cable that will connect it with the Nordic region.[42]

On the other hand, Einari Kisel, head of the Energy Department at the Estonian Ministry of Economy and Communications, considered that Estonia had adopted a cautious stance regarding Poland's involvement in the plan. "It isn't very good if they join," Kisel said. Also, "Poland's inclusion would slow down the preparations, nor is it clear who would be the partner from their side". While Estonia isn't formally opposed to Poland's joining the project, it hasn't agreed to it either.[43]

Estonian fears about additional obstacles involving Poland were not without any motivation. In subsequent negotiations some new requirements were raised from Poland's side, which created tension for the Lithuanian Government and among the Baltic partners.

One of the main preconditions coming from Poland was regarding the capacity of the new power plant. As Minister of Economy of Poland Piotr G. Wozniak said in October 2007, Poland needs 1,200 or at least 1,000 MW from the new power plant. Lithuanian representatives responded that the issue on capacity needs yet to be solved and were more concerned about the division of shares of the joint enterprise.

Lithuanian Prime Minister Gediminas Kirkilas in early 2007 stated that Lithuania plans to control 34 per cent of the enterprise, dividing the remainder equally among the other three partners, each with 22 per cent. This split was approved by the Lithuanian Seimas in the Law on the Nuclear Power Plant of 28 June 2007.[44]

The Environmental Impact Assessment of New Nuclear Power Plant in August 2008 concluded that a new facility with up to 3,400 MW capacity could be installed.[45] This assessment should allow to progress in the process of project implementation. However, we are in the initial

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[42] Ministry of Foreign Affairs of the Republic of Estonia. *Estonian Economy*, Volume 10, No. 11, November 2006, p. 5. http://web-static.vm.ee/static/failid/147/economy_Nov2006.pdf

[43] *Ibid.*

[44] Seimas of the Republic of Lithuania. Law on Nuclear Power Plant, 28 June 2007 No. X-1231 (official translation). http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=315263

[45] AB Lietuvos Energija. *New Nuclear Power Plant in Lithuania Environmental Impact Assessment Report Summary International hearing.* 27 August 2008. http://www.vae.lt/files/EIAR_NNPP_International_hearing_Summary_EN.pdf

stages of preparing to build a new Nuclear Power Plant and further debates among the partners are envisioned.

Energy links: Sweden as a new main strategic partner?

As already said, Poland is a crucial partner for Lithuania in attempts to avoid energy isolation and to integrate its electricity sector into the EU electricity network, but not the only one. Judging the current situation it can be predicted that the first energy link will be completed not with Poland but with Sweden. There is some suspicion that Poland is not eager to rush into the Energy Bridge until the final agreement on the New Nuclear Power Plant in Lithuania is not reached. To begin practical preparation for new electricity infrastructure in Poland supply of 1,000 MW from the new Nuclear Power Plant to Poland needs to be guaranteed.

The construction of the missing chain will complete the Baltic Power Ring, interconnecting Lithuanian, Latvian, Estonian, Finnish, Swedish and Polish power systems, which will ensure security and reliability of operation of Baltic power grids. The project has been listed among the priority projects of the European Union, and a coordinator has been appointed for its implementation.

There are practical issues that need to be addressed regarding synchronisation of Baltic and Poland's electricity systems. The pre-feasibility study concluded from a state load flow assessment of synchronous operation of Baltic power systems with the UCTE, "the year 2015 is the date when the implementation of the first interconnection stage is the earliest possible taking into consideration the time needed for constructing new power plants or transmission lines."[46] The very modest scenario includes the construction of a 154 km high-voltage (400 kV) double circuit line from Alytus (Lithuania) to Ełk (Poland) and 400 kV Narew (Poland) — Ełk (Poland) line. Asynchronous interconnection of the Baltic countries and Poland is possible by 2015 at the earliest, because of construction time of the 400 kV Ełk — Narew transmission line. During this stage, Baltic power systems should remain synchronously interconnected with IPS/UPS. Considering the scenario of synchronous operation of Baltic countries with the UCTE the additional substantial reinforcements in Polish and Baltic countries' grids have to be made.

[46] AB Lietuvos Energija. *The executive summary on pre-feasibility study – state load flow study on synchronous operation of Baltic power systems with the UCTE*, January 2008, p. 4.

Considering only the time needed for preparation of right-of-ways and construction of transmission lines it seems that up to 12 years will be required. The preliminary estimated period of time for implementing synchronous operation seems to be 2020–2025.

The estimation covers three major groups of necessary investment. The first, estimated at 54 million EUR, concerns the Polish–Lithuanian cross-border double-circuit line. The second is related to the large-scale development of the transmission infrastructure in north-eastern Poland, estimated at 430 million EUR. The third group, around 170 million EUR, is targeted to strengthening of some parts of the system due to the interconnection effect enabling equal possibilities of electricity exchange for both sides[47] (see the appendix).

There are obvious Lithuanian concerns regarding additional options for electricity connections. As Lithuanian Prime Minister Gediminas Kirkilas said in June 2007, Lithuania has a strong interest to build the electricity bridge between Lithuania and Sweden — SwindLit. According to Gedinimas Kirkilas, "taking into account the launch of Estlink, which is a successful example of our regional cooperation, the implementation of the SwindLit project could lead towards the creation of a viable regional electricity market in Northern Europe".[48]

A feasibility study of the Lithuanian–Swedish electricity bridge was completed in early 2008. The study was prepared by two companies, Lietuvos energija and Svenska Krafnaat. The feasibility study for interconnection of Lithuanian and Swedish power systems evaluated alternatives to interconnect transmission grids of both countries by the construction of a 350 km submerged cable across the Baltic Sea bed. According to preliminary evaluation, the investments into the project would total about EUR 516 million, if a 700 MW cable is constructed or EUR 637 million if a 1,000 MW cable is utilised. The project could be completed before 2015.[49]

The study results note that if a wind park is constructed in the Baltic Sea, then it could be connected to the cable, but in this case the cable capacity should be 1,000 MW. Otherwise the cable capacity could be 700 MW. The 1,000 MW power bridge Lithuania–Sweden

[47] AB Lietuvos Energija. *The executive summary on pre-feasibility study – state load flow study on synchronous operation of Baltic power systems with the UCTE*, January 2008, p. 4.

[48] Speech of Prime Minister Gediminas Kirkilas at the Baltic Regional Energy Forum in Riga, 2007 June 12. http://www.lrv.lt/main_en.php?id=en_aktualijos_su_video/p.php&n=406

[49] AB Lietuvos Energija. *Interconnection Between Lithuanian and Swedish Power Systems — Feasible.* (News release) 6 February 2008. http://www.le.lt/en/main/news/press?ID=636

would create motivation not only for interconnection of power systems, but also for development of renewable power sources in both countries.

This evaluation allows immediate initiation of work. The construction of a submerged cable from Lithuania to Sweden would be an important practical step in breaking dependence from Russia in cases of major disruptions of electricity systems in the Baltic States or in periods of insufficient electricity production. Looking only on the practical side the SwindLit project might be implemented even sooner than the Energy Bridge with Poland, and considering this, Sweden could be proclaimed as the main strategic partner for Lithuania.

There are some political issues that need to be solved. There is a Lithuanian and Latvian dispute about the implementation of connections with Sweden. The Latvian Government has also proposed a project to construct a connection with Sweden. This proposal forced Svenska Krafnaat to say that the two Baltic States must meet an agreement between themselves before further development can continue. However, in December 2008, there still was no agreement reached between the Lithuanian and Latvian governments regarding the connection with Sweden.[50]

However, there are some good examples of cooperation on energy between Lithuanian and Latvian governments. On 7 December 2008, Lithuania and Latvia signed an agreement allowing reserves of oil and oil products to be maintained in each others territory.[51] This agreement was initiated by Latvian Government because of the need to fulfil the Directive of European Commission to maintain 90 days of oil supplies for emergencies. Latvia does not have the capacity needed to maintain this amount of oil and Lithuania is ready to help with this. This example of mutual cooperation gives hope that other disputes will be solved as well.

[50] Newly elected Prime Minister of Lithuania Andrius Kubilius after a visit to Latvia on 26 January 2009 said that he was almost sure to get Latvian approval to construct the energy bridge from Sweden to Lithuania. The economic crisis in Latvia leaves few possibilities for the Latvian Government to contribute significantly for this project.

[51] The Ministry of Economy of Republic of Lithuania. News release, 7 December 2008. http://www.ukmin.lt/lt/dokumentai/ziniasklaidai/detail.php?ID=23919

Figure 8. **Energy system and projected links of the Baltic States**

Source: AB Lietuvos Energija. The executive summary on pre-feasibility steady — state load flow study on synchronous operation of Baltic power systems with the UCTE. Vilnius, 2008. http://www.le.lt/repository/UCTE%20projektai/2008%2003%2020%20PreFeasibility%20SSLF%20EX%20Summary.pdf

Conclusions

In recent years, Lithuania has faced many challenges on energy security. However, the situation in the energy sector has not undergone much change. Lithuania is still rather isolated regarding energy infrastructure. It was understood early that the very first task to deal with regarding energy security threats is to break energy isolation. This requires strong regional cooperation and understanding of not only the domestic needs but also the needs of neighbouring countries. Lithuania only recently "discovered" that the other Baltic States and Poland have faced quite similar problems. This provided a ground for some common projects in the development of energy infrastructure.

However, political initiatives are not sufficient to initiate development. The energy companies in each country also have their interests and specific needs that need to be considered. The biggest challenge for Lithuania might be coordination of all interest groups regarding the installation of the New Nuclear Power Plant. This is the biggest project in the Baltic States, and will show whether real coordination and eventually a common energy market are possible in the Baltic Sea region.

All of the developments in regional energy cooperation should have an important impact on Lithuanian strategic thinking. Until recently, Lithuanian strategy planners were mostly concerned only about domestic energy balance and capacity. Now it is obvious that Lithuanian energy policy cannot be implemented without taking into account all of the needs and specific features of the Baltic States as well as other neighbouring countries. The first sign of a common attitude towards energy cooperation was reflected in the Baltic Energy Strategy, signed in 1999. However, this strategy is outdated and a new project of the Baltic Energy Strategy is prepared.[52] The new version of the Baltic Energy Strategy is more extensive but still lacks a monitoring or evaluation system of the implementation of the strategy and development in the Baltic energy sector.

The main ideas and plans on promoting cooperation and involving all interested parts in regional projects are sufficiently developed, but speeding up the implementation is badly needed. As the dispute between Lithuania and Latvia regarding the link with Sweden shows, until now every part is thinking more about their own interests and potential gain

[52] See: Ministry of Economy of Republic of Lithuania. *Baltic Energy Strategy*, Draft. http://www.ukmin.lt/lt/veiklos_kryptys/energetika/NES/doc/BES2007_en.doc

but not about common interests. There should be a real change in the minds of policy makers and energy companies: the regional approach towards energy challenges should replace the domestic or even intra-company approaches.

Some motivation from external sources also could be useful. The European Commission in November 2008 presented to the European Council a European Economic Recovery Plan where the need to invest in energy infrastructure and inter-connection is stressed.[53] The European Commission proposed for 2009 and 2010 to mobilise an additional € 5 billon for trans-European energy interconnections and broadband infrastructure projects. Within this framework the European Commission approved 175 million Euros of support for "Swedlink" project implementation. This initiative (though to be yet approved by the European Council) should be used as effectively as possibly for accelerating the regional projects in the Baltic States.

[53] Commission of the European Communities. *Communication from the Commission to the European Council. A European Economy Recovery Plan*. Brussels, 26.11.2008, COM(2008) 800 final. http://ec.europa.eu/commission_barroso/president/pdf/Comm_20081126.pdf