

National Energy (Energy Independence) Strategy of Lithuania

Strategic Initiatives

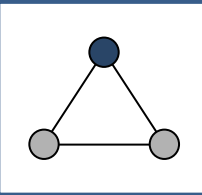
Strategy was endorsed by the Government of the Republic of Lithuania by Resolution No. 1426 on October 6th, 2010 and submitted to the Parliament for the final approval

Lithuanian energy sector is currently not fully aligned with the strategic principles

Strategic principles of the energy sector

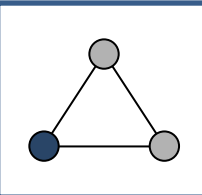
Most important until 2020

Current situation



Energy independence

- Single supplier of fossil fuels
- Isolation from the EU energy systems
- Shortage of competitive power generation capacities (half of electricity is imported)



Competitiveness

- Steadily rising electricity prices
- The goal to fully de-monopolize the domestic market and integrate into the EU market
- Energy intensity (energy consumption per GDP unit) is higher than EU average



Sustainability

- Energy used inefficiently. High energy efficiency potential in the heating sector
- Increasing greenhouse gas emissions
- The adoption of new technologies under consideration

Long-term vision of Lithuanian energy sector: shifting priorities

2020

Energy independence

- Synchronization with EU energy systems and integration into energy markets of the Baltic Sea Region
- Diversified import of energy
- Sufficient capacities to cover domestic demand
- Market liberalization

2030

Competitive and sustainable energy sector

- Optimization of energy-mix and development of infrastructure
- Increasing energy efficiency and reduction of greenhouse gas

2050

Enhancement of sustainable energy sector

- New breakthrough technologies adopted
- Promotion of sustainable energy

Strategic initiatives till 2020

A Power sector initiatives

1. To integrate with European electricity networks
2. New nuclear power plant
3. To increase production from renewable energy sources
4. To liberalize electricity market and reorganize electricity sector

C Gas sector initiatives

1. LNG terminal
2. Pipeline to Poland
3. Underground gas storage
4. To liberalize gas market (unbundling of ownership of gas supply and gas transmission)
5. To support exploration of shale gas

F Energy efficiency initiatives

1. To increase total energy consumption efficiency by 1.5% annually

B Heating sector initiatives

1. To save heat energy through insulation
2. To promote changes in the production mix in order to diminish gas consumption and increase share of renewable energy sources
3. To increase competition and liberalize market

D Oil sector initiatives

1. To increase competition in the oil sector to ensure low prices for the consumers

E Renewable energy sources initiatives

1. To increase the share of renewable energy to 23 % of total energy consumption – the target is aligned with overall European Union goals

G Environment and greenhouse gas emission reduction initiatives

1. To implement EU and international environmental convention targets for 2020

A Electricity production, transmission and distribution strategy

Vision

- Synchronized with the EU and integrated with other regional systems
- Sufficient capacities to cover domestic demand
- Diversified fuel supply
- Large share of electricity in energy-mix of Lithuania

Current situation

- Lack of supply in the Baltic States (1.3 GW in 2020) due to the closure of Ignalina NPP and other older plants as well as expected growth in the region
- Production mix heavily dependant on fossil fuels
- No electricity link with the EU and thus no possibility to exploit the benefits of single market
- Extensive electricity network requiring investments into modernization

Strategic initiatives

- Ⓐ1 **Integration with European electricity networks**
 - *LitPol Link* (Lithuania-Poland interconnections)
 - To integrate into the Nordic market (including *NordBalt* construction)
 - Synchronous interconnection with European Continental Networks (ECN)
 - To strengthen internal network
 - To finalize creation of common Baltic electricity market
- Ⓐ2 **Self – sufficient generation**
 - Visaginas nuclear power plant
 - To finalize other ongoing constructions
- Ⓐ3 **Increase in production from renewable energy sources**
- Ⓐ4 **Market liberalization and electricity sector reorganization (ownership unbundling)**

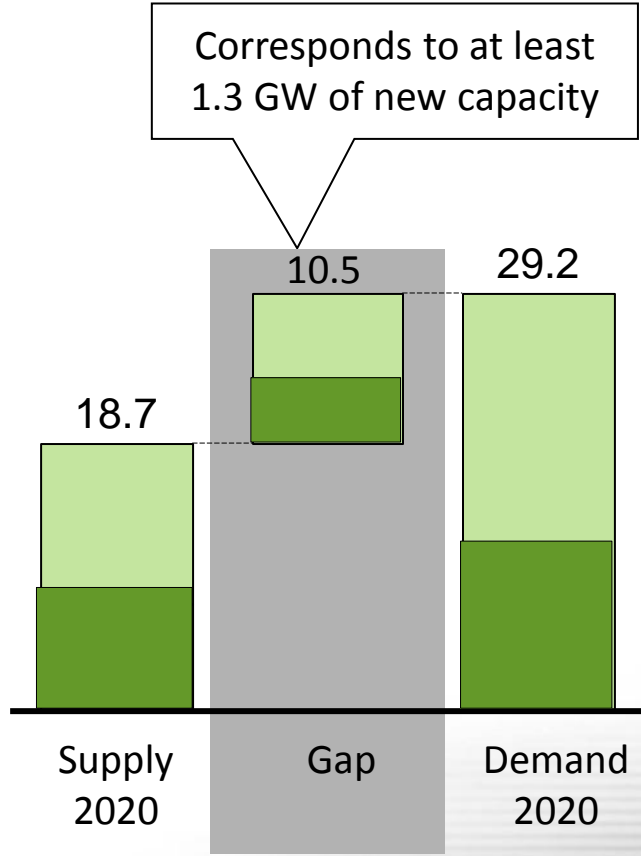
A1 In order to balance electricity demand and supply in 2020 in the Baltic States, at least 1.3 GW of new capacity has to be built

TWh, all Baltic States, "Middle case" macroeconomic scenario

 Lithuania

Supply

- **Supply in 2020** is composed of
 - **Existing units**, running potentially with higher utilization
 - **New builds** (CCGT in Lietuvos elektrinė; 5th unit of Kruonis Pumped Storage Plant)
- Excluding units to be decommissioned before 2020 and Visaginas NPP






Demand

- **Key drivers** of electricity demand in 2020 are the post-crisis **GDP growth** and future **energy efficiency** improvements
- Depending on macroeconomic scenario, demand in the Baltic States might vary in the range from 27 to 33 TWh per year

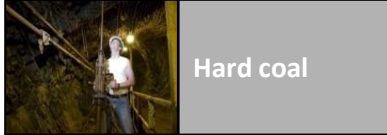


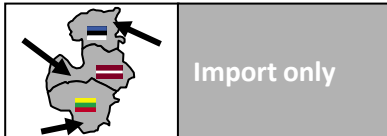
A2 Building new NPP is the most viable option to close the gap

Nuclear scores well on all the criteria...



Criteria	New NPP
 Energy independence	<ul style="list-style-type: none"> • High energy independence due to the possibility to import fuel potentially from multiple countries • It is a regional project ensuring additional generation capacities for Estonia, Latvia, Lithuania and Poland
 Competitiveness	<ul style="list-style-type: none"> • Positive impact on export balance • Potential boost of economy during construction period • From the economic point of view, more attractive than other options
 Sustainability	<ul style="list-style-type: none"> • No CO₂ emissions, • High contribution to EU's CO₂ emissions reduction targets

... while other technologies have some important drawbacks

Option	Drawbacks
 Hard coal	<ul style="list-style-type: none"> • High environment pollution • Economically unattractive due to high CO₂ emission price
 Gas (piped)	<ul style="list-style-type: none"> • Low energy independence – fuel coming from one source • 10-years payments for imported gas equal to investment into nuclear
 Gas (LNG)	<ul style="list-style-type: none"> • Business case not attractive due to unstable fuel prices
 Import only	<ul style="list-style-type: none"> • Very low level of energy independence • Negative impact on export/import balance

B Heating sector strategy

Vision

- Enhanced energy independence through **increased energy efficiency** in heating sector and shift towards the use of renewable energy sources for heating production
- Low heating price for end users

Current situation

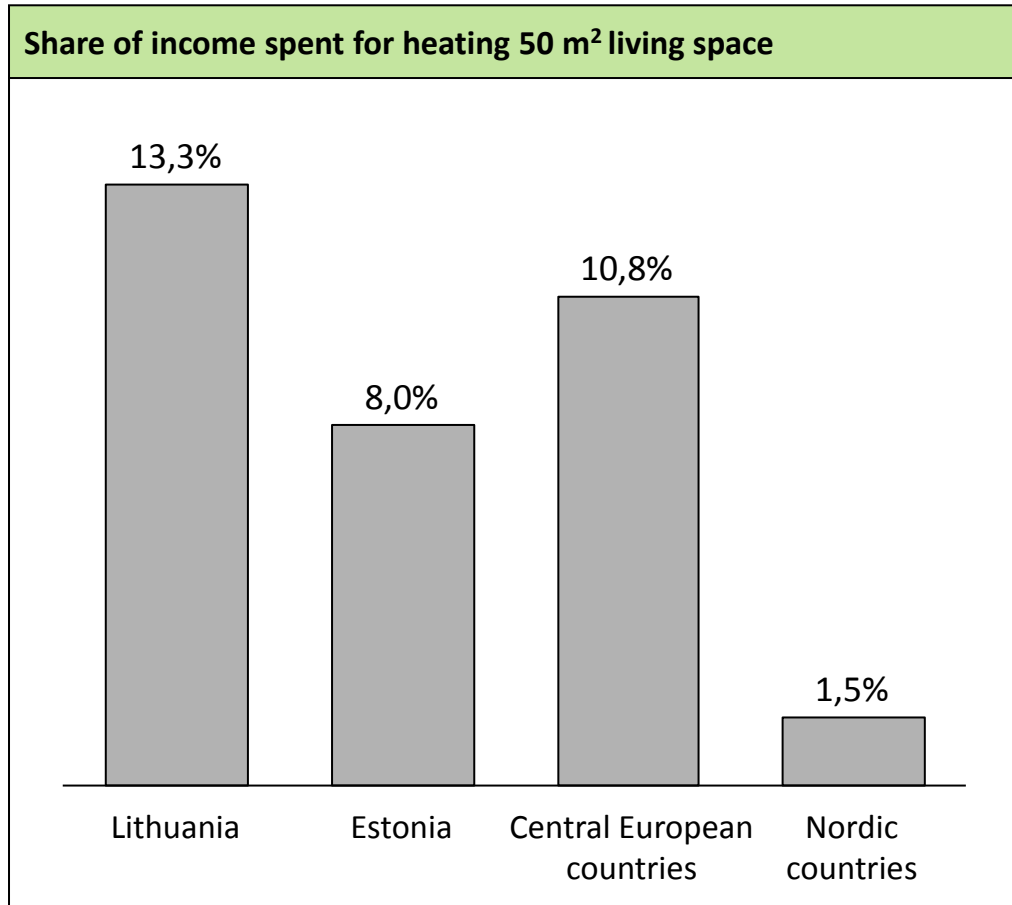
- Lithuania's heat production system is based on fossil fuels (more than 70% gas)
- High heat consumption of buildings
- Low competition of heat suppliers
- High heating price

Strategic initiatives

- ① Support of heat savings initiatives
- ② Promotion of changes in the production mix in order to decrease gas consumption and increase share of renewable energy
 - To increase production from biomass (both bio boilers and bio CHPs)
 - To utilize waste in the most efficient way to produce heat
 - To utilize available residual heat
- ③ Increase in competition and market liberalization

Given the high importance of heating sector in achieving energy independence, Ministry of Energy puts priority on achieving its strategic goals in this sector and will seek for joint cooperation with other ministries, municipalities and other institutions involved.

B1 Lithuanian households spend larger share of their income on heating than those in other EU countries



Current situation

Due to higher heat consumption in buildings and low income, households in Lithuania spend larger share of their income on heating

C Gas sector strategy

Vision

- Decrease in the consumption of gas in the long run while ensuring independence of supply in the short and medium term

Current situation

- Demand for gas in 2020 will range from 1.6 to 3.7 bcm (emergency 0.9-1.5 bcm)
- Non-diversified supply
- Lithuania is not able to independently cover emergency gas demand
- No access to EU spot markets

Strategic initiatives

- ① LNG terminal – the best and fastest option in solving the problem of Lithuania's dependency on gas
- ② Pipeline to Poland
- ③ Natural gas storage
- ④ Liberalization of gas market (unbundling of ownership of gas supply and gas transmission)
- ⑤ Support exploration of shale gas

D Oil sector strategy

Vision

- Diversified supply of oil and oil products and decrease in the use of oil products in the long run

Current situation

- Diversified oil and oil products supply through *Klaipėdos nafta*
- Sufficient back up supply reserves (for 90 days)
- Sufficient infrastructure and refining capacities
- Sufficient competitiveness not yet ensured

Strategic initiatives

- ① Increase in competition in the oil sector to ensure low prices for the consumers:
 - Ensure *Klaipėdos nafta* as a strategic and state attended company and maintain supply of oil products through the sea
 - Supply of oil products in most competitive way

E Renewable energy sources sector strategy

Vision

- Increase in energy production from renewable energy sources in order to diversify energy-mix and boost energy independence
- Preference on the most economically feasible technical solutions
- Implementation of EU requirements and targets

Current situation

- Current share of renewable energy sources in the final energy consumption is 15%
- EU target for Lithuania for 2020 is 23% of renewable energy sources in the final energy consumption
- Majority of energy from renewable energy sources is currently being produced from biomass

Strategic initiatives

- ① Increase in the share of renewable energy in electricity, heat and transportation – targets are aligned with overall EU goals
 - **Electricity**
 - 20% (mainly from biomass and partially wind)
 - Construction of the 5th unit of Kruonis Pumped Storage Plant
 - **Heat**
 - 60% of centralized heat production (from biomass)
 - **Transportation**
 - 10% from biofuels

Ministry of Energy will ensure creation of favourable market conditions for optimal energy production from renewables.

F Energy efficiency strategy

Vision

- Increased energy efficiency in all areas of the final energy consumption

Current situation

- Energy intensity in Lithuania is 2.5 times higher per GDP unit than EU average
- Energy savings potential is especially high in the households' and transport sector

Strategic initiatives

- Ⓡ1 Increase in total energy consumption efficiency by 1.5% annually until 2020 with major potential identified in:
 - Heat efficiency of households and public sector buildings
 - Transport
 - Industry

G Environment protection and CO₂ reduction strategy

Vision

- Energy sector is environmentally friendly and meets international environmental conventions such as the Kyoto protocol, EU Climate Change Package (CO₂ – maximum rise of GHG production till 2020 by 15 % compared to 2005)

Current situation

- Sharp decrease in CO₂ emissions after 1990
- Increase of CO₂ emissions in 2010 due to closure of Ignalina NPP and increased use of older thermal plants whose operation is based on fossil fuels
- Increase in CO₂ emissions has been mitigated by importing a part of electricity from abroad

Strategic initiatives

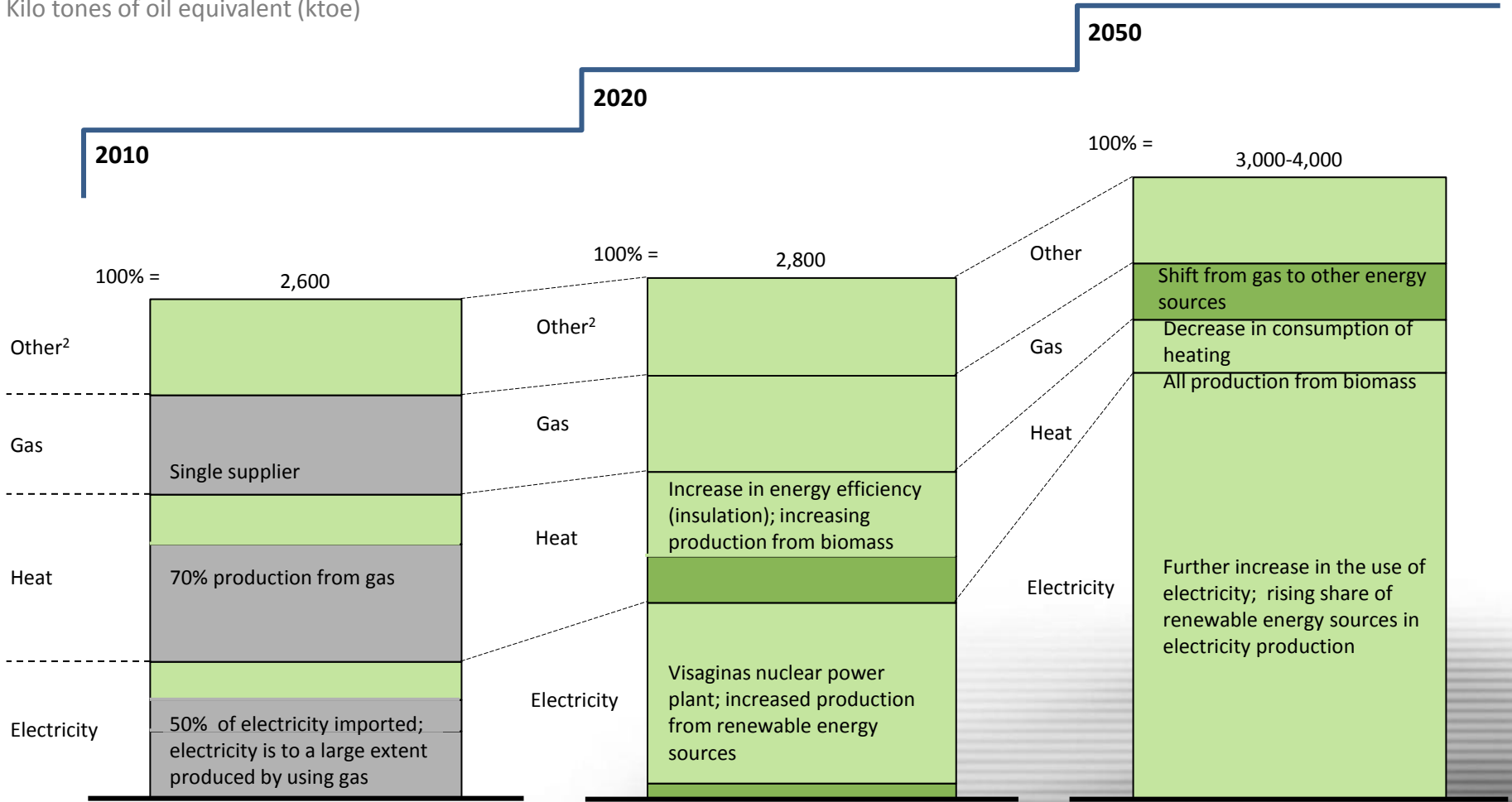
- Ⓜ1 Several measures are in place to decrease the emission levels – those related to the Ministry of Energy are:
- Construction of a new nuclear power plant
 - Increase in production of energy from renewable energy sources
 - Energy efficiency measures

Lithuania will meet all relevant targets of EU and international environmental conventions in 2020

The Strategy will help achieve energy independence by 2020

- Supply from single external source
- Independent fuel source
- Gas can be imported through LNG (independent)

Final energy consumption forecast¹
Kilo tones of oil equivalent (ktoe)



1 Does not include oil and other energy sources that have independent sources of supply
2 Mostly firewood

Energy independence: despite large investments greater benefits expected

Public investment
11–17 Billion LTL

Private investment
18–24 Billion LTL

Investment: 29–41 Billion LTL

- Every year **3–4 billion LTL** will be saved that are now spent on fuel imports – these financial resources will stay in the Lithuanian economy (**3–4 percent of GDP**)

- **Stable** energy prices;
- **Secure** energy supply;
- Annual household spending for heating will **decrease by approximately 500 LTL**

- **5000–6000 permanent work places** will be created **in energy sector**;
- Investments will **stimulate Lithuania's economy** in construction and service sectors

Energy independence