Directions and Proposals for Industrial Economy: Energy Sector Developments in Lithuania

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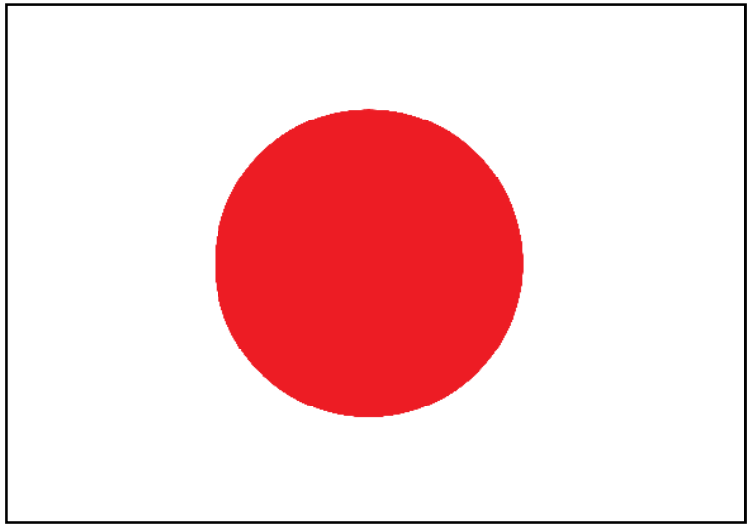
On comparison…

- Area of **Lithuania**:
  65 200 km²
- Population of **Lithuania**:
  3,5 million

- Area of **Hokkaido island**:
  83 453 km²
- Population of **daytime Osaka**:
  3,7 million



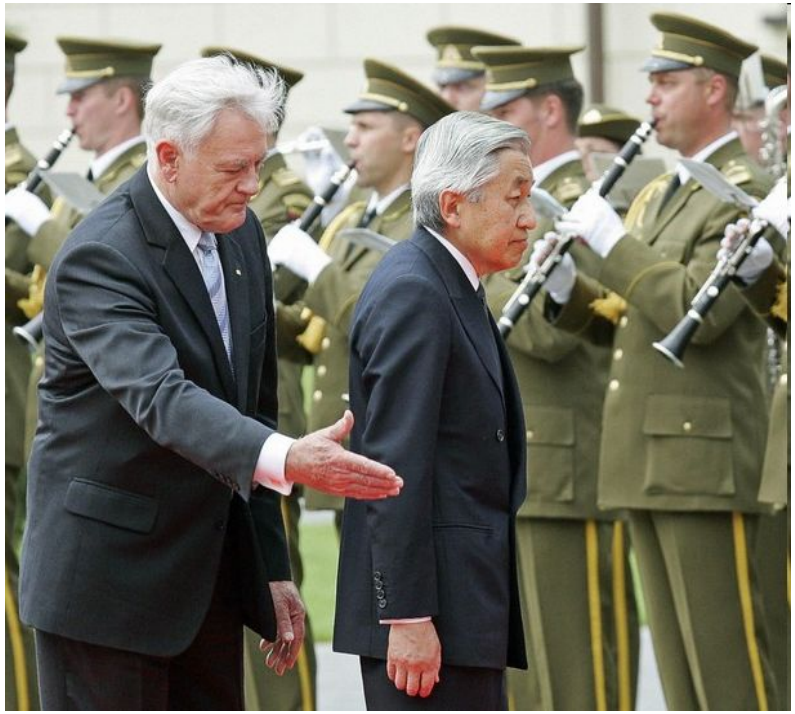
Presentation plan

- **Lithuania and Japan – main connecting points**
- **Lithuania and Japan – similarities and differences in energy sector**
- **Energy in Lithuania: *status quo* and the main developments**

Lithuania and Japan – main connecting points

Diplomatic Relations

- Diplomatic relations initiated in 1922 – Japan recognised Lithuania *de jure*.
- In 1937 Lithuania appointed the Honorary Consul M. Yasaka in Tokyo, and in 1939 the consular representation of Japan was opened in Kaunas.
- In 1941 the diplomatic relations of the two countries were interrupted for 50 years. They were restored in 1991.



Vilnius, LITHUANIA, 2007 : Japanese Emperor Akihito and Lithuanian President Valdas Adamkus.

Chiune Sugihara

- Chiune Sugihara issued about 6000 Japanese “life visas” to people of Jewish nationality trying to escape from the Nazis in Poland.

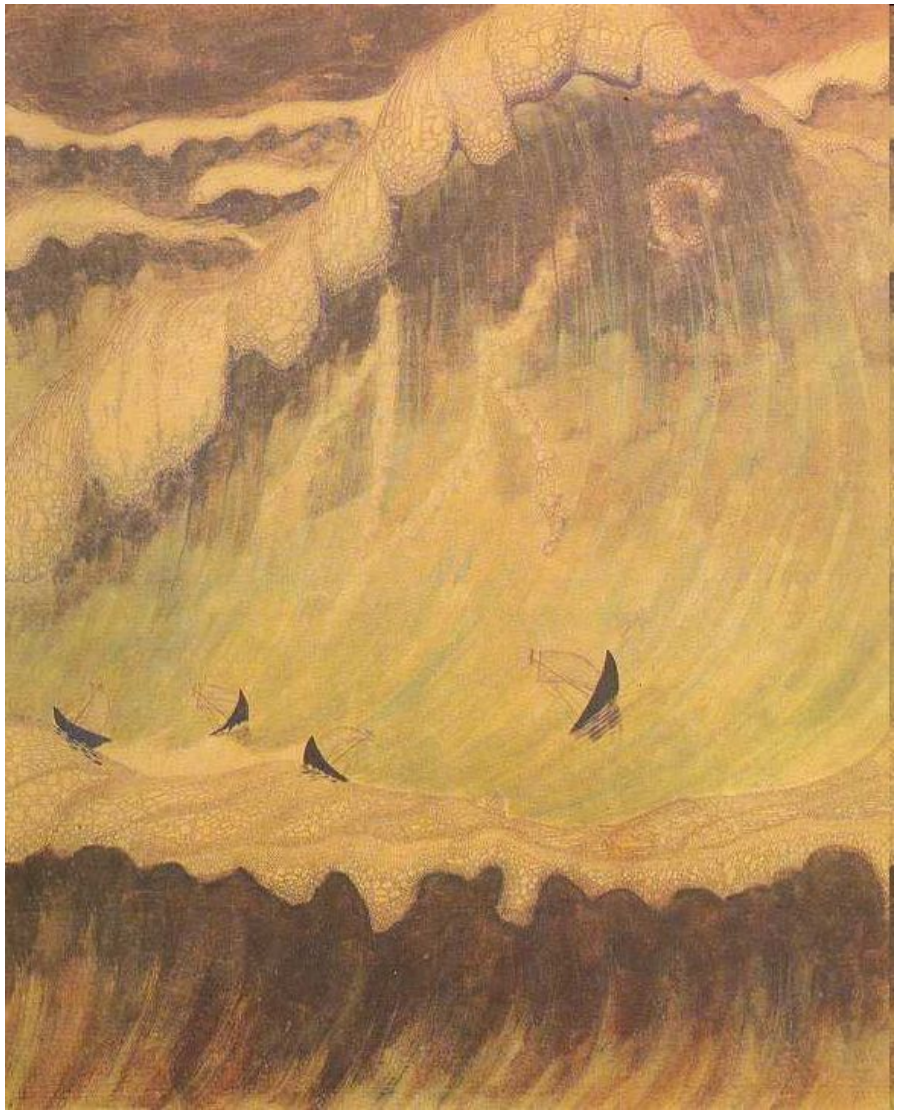
- In Lithuania one of Vilnius streets was named after him, a monument was raised, and his house in Kaunas where the diplomat lived and worked is now his Memorial House.

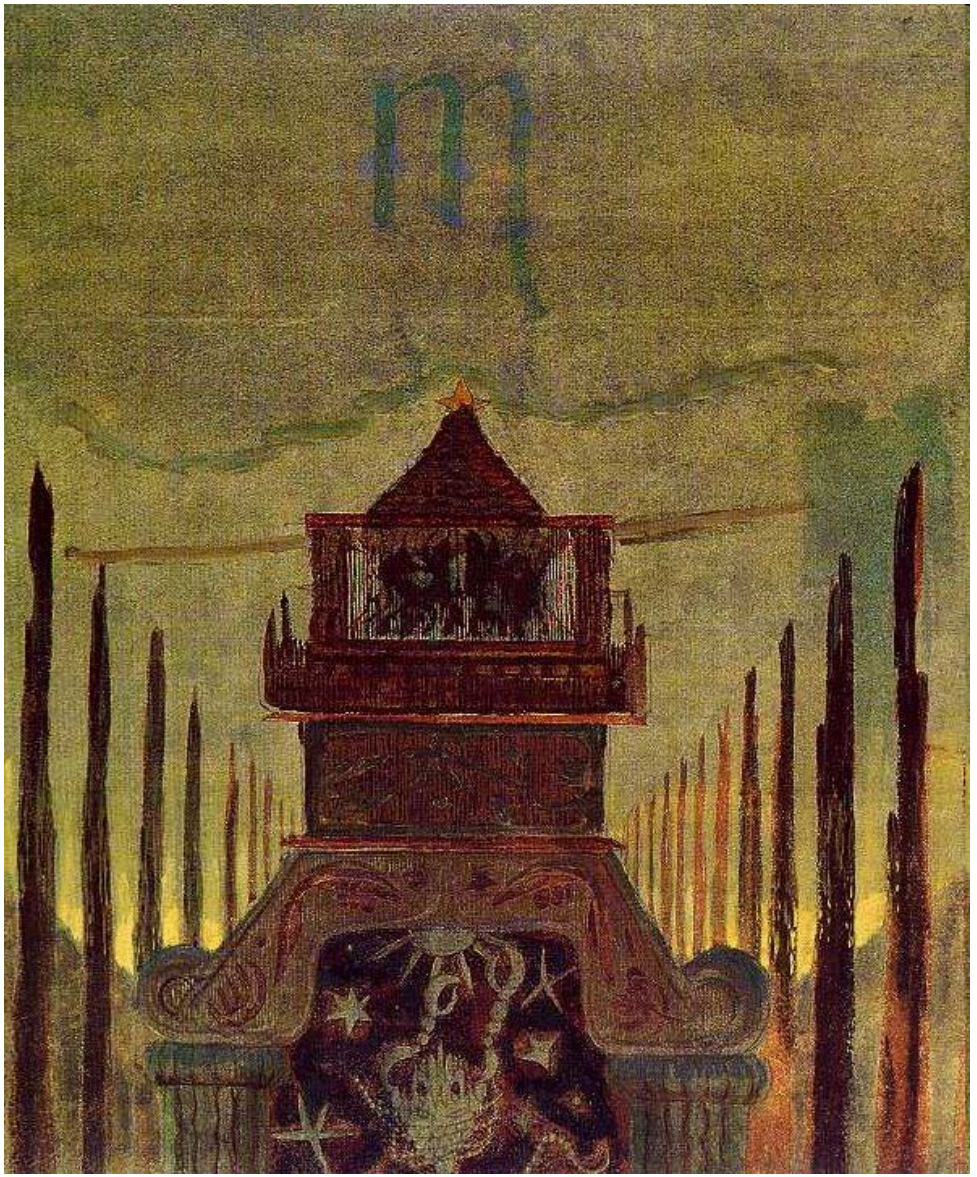
Sakura wood in Vilnius and Kaunas

In 2001 by commemorating 100 birth anniversary of Chiune Sugihara 200 Sakura trees were planted

Lithuania Discovered through M. K. Čiurlionis

- In 1992 the masterpiece “Sea Sonata” at the exhibition of M. K. Čiurlionis works in Japan was given much attention.
- Art critics point out that this work was inspired by “The Wave” of the Japanese artist K. Hokusai and that in general links between M. K. Čiurlionis’ works and the Japanese art are undeniable.
- In the seventies of the 20th century the art critic, culturologist and musicologist Ichiro Kato from Yokohama taking interest in M. K. Čiurlionis’ works founded M. K. Čiurlionis’ Club for popularising his art in Japan and became its president.
- “Čiurlionis helped us to discover Lithuania and we are helping our compatriots to discover it”, in 1975 said Ichiro Kato.





Areas for cooperation

- **Current:** **Biotechnology, Laser technologies, Mechatronics**

- **Potential:** **Energy developments**

Biotechnology

- The Lithuanian biotech sector's sales have grown by about 22 % each year for the last 5 years
- Although the Lithuanian biotechnology industry is relatively small, experts at the worldwide auditing and business consulting firm Ernst & Young have assessed it **as having no equivalent in Central and Eastern Europe**
- Export of products to 47 countries

Fermentas Ltd.

- Fermentas Ltd. is a R&D and manufacturing company, which develop and produce products for genetic engineering, molecular biology, genomic research and other biotechnological investigations (over 400 items)

- More than 99 % of the products are exported

Sicor Biotech Ltd.

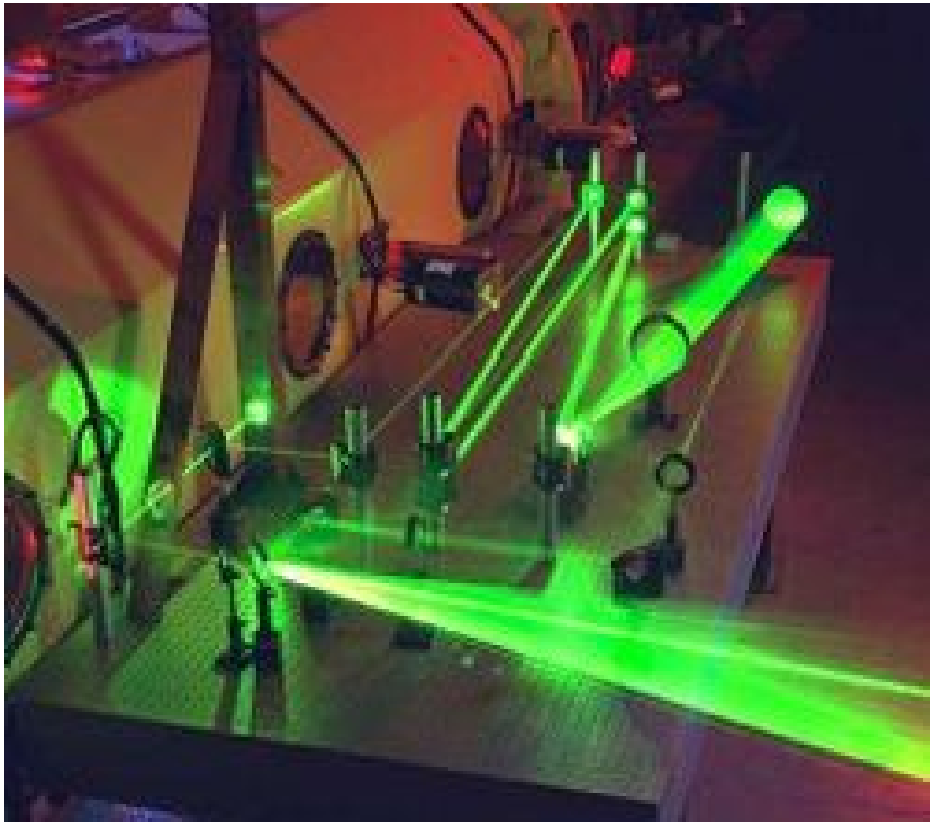
- Sicor Biotech Ltd. in Lithuania is producing recombinant proteins for medical use (interferon alpha-2b, human growth hormone, granulocyte colonies stimulating factor, erythropoietin)

- It is the only factory of such a profile in Eastern and Central Europe

- It has strong and very well equipped research centre, developing technologies for production of recombinant proteins

Laser Technologies

- Lithuania produces high quality lasers
- Scientific laser export – 5 % in world market
- Lithuanian laser scientists work in Japan



Laser Technologies (II)

- 95 percent of laser technology products manufactured in Lithuania are exported to the US, Western Europe and Japan

- Special laser equipment is purchased by the Pentagon, NATO and military research laboratories

- This sector's output is exported to nearly 100 countries

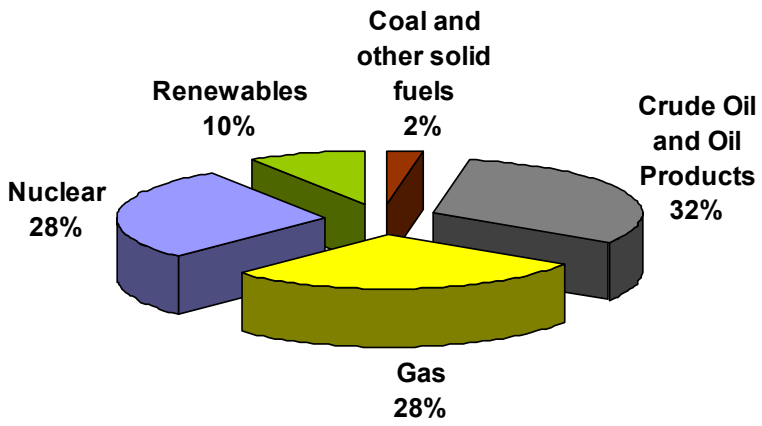
Mechatronics

- Mechatronics accounts for a significant part of the knowledge-based industry in Lithuania
- Mechatronics is the synergetic combination of mechanical engineering, electrical engineering and electronic control to design systems featuring new quality technologies with high added value
- Mechatronics represents nearly 20 percent of all manufacturing output in Lithuania, as well as part of medical services, communications and others

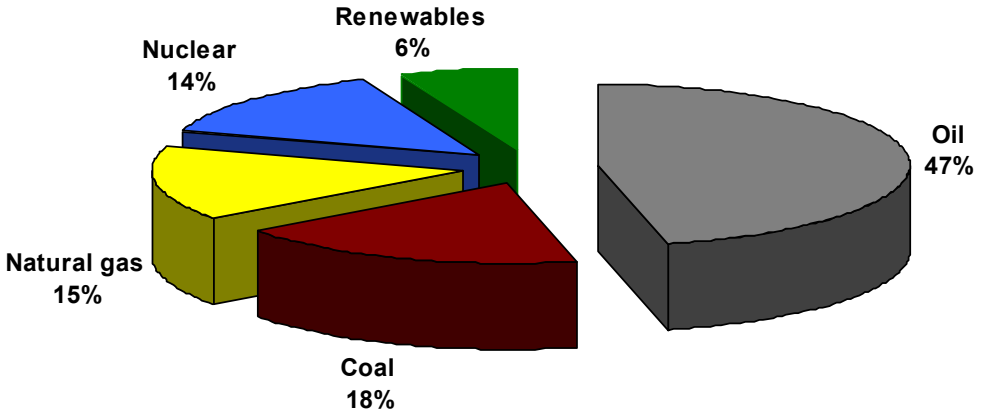
Lithuania and Japan – similarities and differences in energy sector

Lithuania and Japan: energy-mix

Lithuania



Japan



Energy strategy guidelines

National Energy strategy of Japan, 2006

- Improving **energy efficiency** and **diversifying** and decentralizing energy resources. **Nuclear power is given special attention** for its ability to reduce external dependency as well as to reduce CO2 emissions;
- Strengthening Japan's resource diplomacy using government support to **enhance Japan's ability to secure a stable supply of oil and gas resources**;
- Improving the country's **existing oil stockpiling system and developing a stockpiling system for gas**, which is now barely present.

National Energy strategy of Lithuania, 2007

- Improving **energy efficiency**, **renewables** and **diversifying** energy resources. **Nuclear power is given special attention** for its ability to reduce external dependency as well as to reduce CO2 emissions;
- **Diversification of oil and gas supply**;
- **Integration** towards EU energy market through **infrastructure developments**
- Development of the **gas storage capacities**

Energy in Japan and Lithuania

Similarities

- Self-sufficiency in energy is very low – high dependency on the import of energy resources (diversification of sources)
- Government policy promoting nuclear energy
- Government policy promoting energy efficiency

Differences

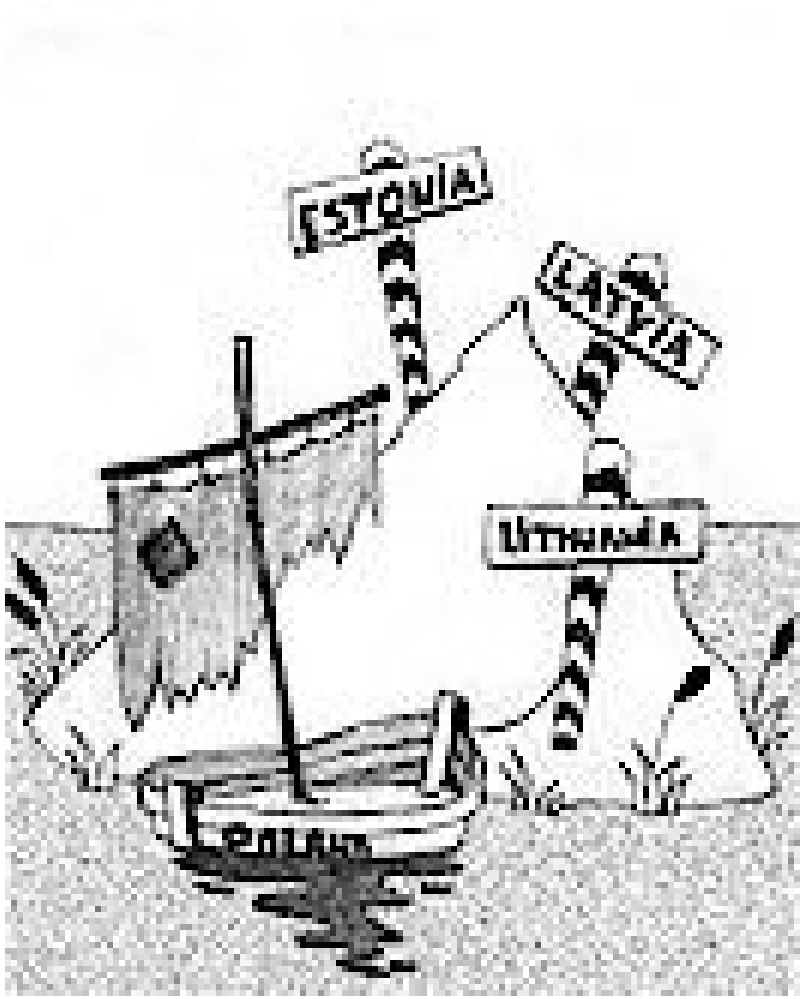
- Diversification of resources
- Development of nuclear power and natural gas reduces Japan dependency on oil while in Lithuania the development of nuclear power first of all is dedicated to reduce Lithuania‘s dependency on natural gas

The same starting position → different supply and demands of technologies = area for cooperation

- **Japan** → **Import of energy resources *vs* export of technologies**

- **Lithuania** → **Import of energy resources *vs* demand for technologies (nuclear power, LNG, regasification, storage)**

- Japan is an **island**...
- Lithuania, as well as Estonia and Latvia – **ENERGY ISLAND**



ENERGY in Lithuania: STATUS QUO and the MAIN DEVELOPMENTS

Lithuania – energy challenges

- Energy isolation (“energy island”)
- Dependence on single external supplier
- Dependence from single energy source (fossil fuel)

How these challenges are going to be addressed?

Baltic Energy Market Interconnection Plan (BEMIP) endorsed by the Heads of the states of BSR and the President of the European Commission on the **17th of June 2009**

- **ELECTRICITY**
  - **Common market**
  - **Interconnections**
  - **Development of new generation sources**
- **GAS**
  - **Interconnections**
  - **LNG, UGS**
- RENEWABLES, EFFICIENCY, ENERGY SAVING

Main Energy Developments: ELECTRICITY INTERCONNECTIONS

- Sweden-Lithuania link (NordBalt - 2015)
- Lithuania-Poland link (LitPolLink - 2015)
- Estonia-Finland link (EstLink 2 - 2014)
- Strengthening of Estonian-Latvian interconnections
- Integration into UCTE (ENTSO-E)

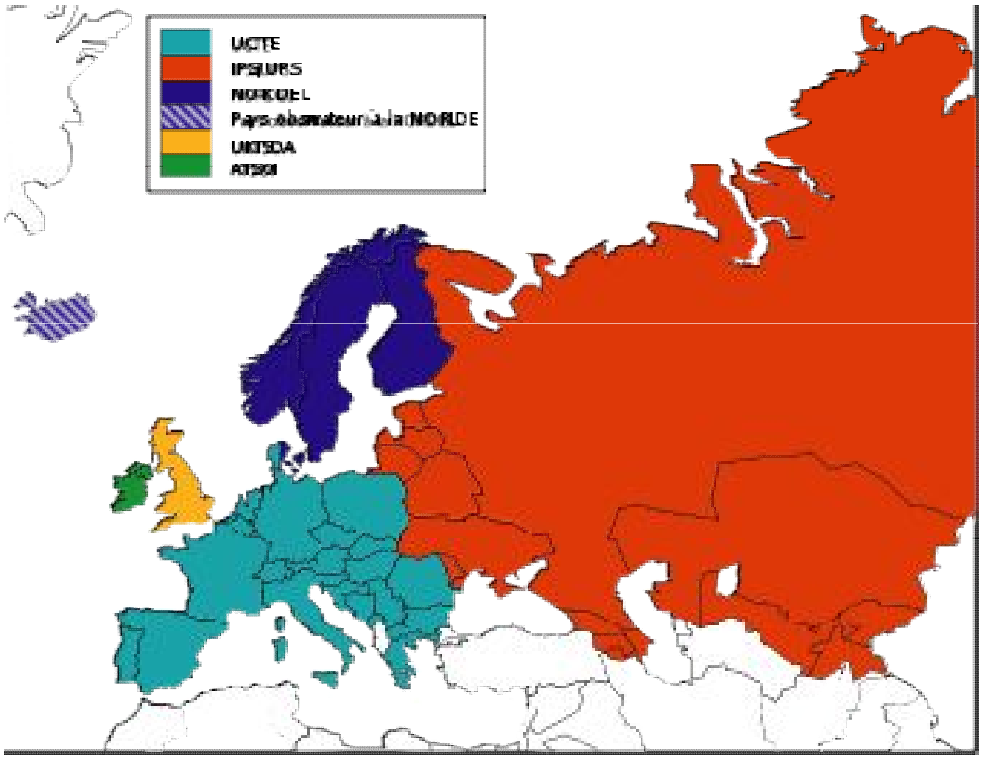
Main Energy Developments: NUCLEAR POWER

- **Decommissioning of 1300 MW capacity Ignalina NPP by the end of 2009 (provides over 70 % of Lithuanian electricity consumption)**

- **New NPP – Visaginas nuclear power plant (project under development)**

Visaginas NPP – Regional Project

- Participating States: Estonia, Latvia, Lithuania, Poland
- Electricity could be supplied for the whole Baltic region
- Long-term goal of Synchronous interconnection with UCTE (ENTSO-E)



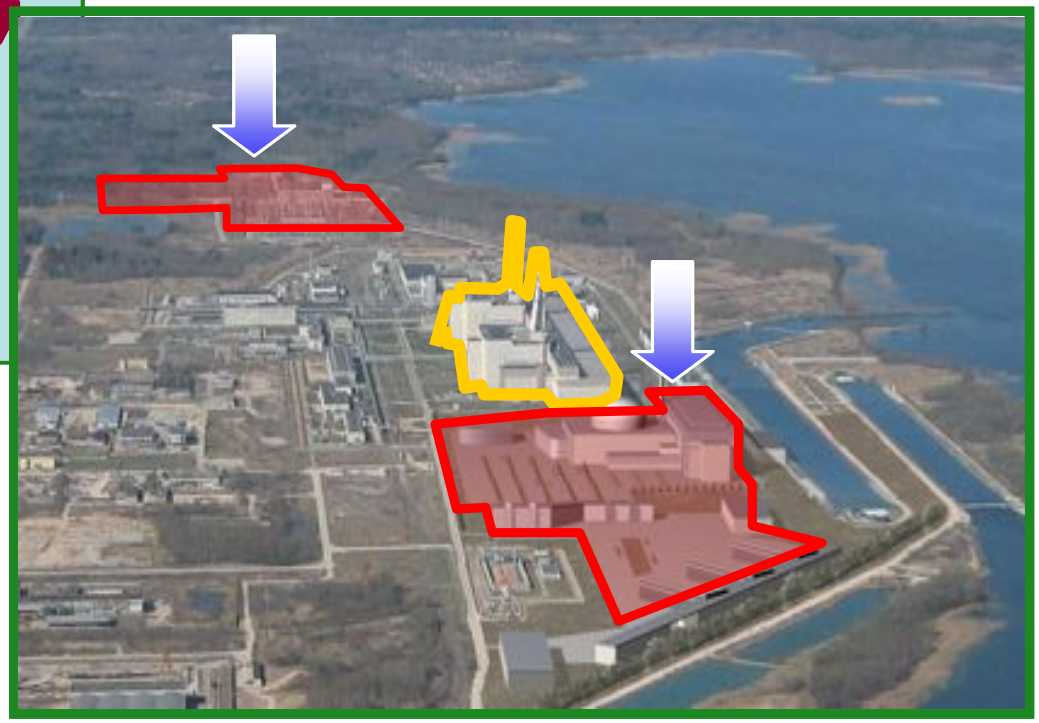
Current developments in nuclear energy (Visaginas NPP) of Lithuania

- In September 2009, the UK investment bank “Rothschild & Sons” presented draft business plan and financial model of the Visaginas NPP project. It concludes that **this project is economically viable and commercially attractive**.
- Till the beginning of 2010, we are planning to lay down the conditions for selection of the strategic investor, and, **in the 2nd quarter of 2010, to choose the strategic investor**.
- The Visaginas NPP will enhance security of energy supply of the Baltic States and **reduce dependency on fossil fuels.** It will also enable us to have electricity at lower prices and **step up our fight against climate change.**

Possible location of Visaginas Nuclear Power Plant

Ignalina NPP site

Two suggested alternative sites for the New Nuclear Power Plant



Visaginas Nuclear Power Plant: Three-step approach

1. **Selection of the Strategic Investor**

(2nd half of 2010)

2. Selection of the proper capacity and appropriate technology

(PWR, BWR, PHWR, etc.)

3. Construction of NPP

(estimated commissioning – 2018–2020)

Visaginas Nuclear Power Plant: Progress to-date and next steps – process on track (I)

Milestones achieved to date

- New Nuclear Power Plant law ratified by Parliament
- Government Decree 300 signed
- Memorandum of Baltic Ministers on regional energy strategy signed
- Environmental Impact Assessment of the Visaginas site complete
- Business Proposal and Financing Plan prepared
- Supports commercial and financial viability of the project
- Identifies key considerations for Lithuania in creating an attractive investment platform and regulatory regime
- Formal contact with potential regional partners established

Visaginas Nuclear Power Plant: Progress to-date and next steps – process on track (II)

Next steps

- Discussions with investors launched (before the end of 2009)
- Negotiations on proposals received (Q1 2010)
- Formation of Partnership and signing of Development Agreement (2010)
- Planning phase (estimated 2010-2012/3)
- Construction phase (estimated 2012/3-2018/20)
- Estimated commissioning of the new power plant (estimated 2018-2020)

Main Energy Developments: LNG

- **Three options:**
  - LNG terminal: feasibility study to be finished in October 2010
  - Regasification on board: feasibility study to be finished in the 1st half of 2010
  - Compressed natural gas

Main Energy Developments: UGS

- **Syderiai Underground Gas Storage:**
  - At the end of October 2009, an international tender was published to explore the geological and geoseismic structure of Syderiai in order determine the suitability of Syderiai for the natural gas storage facility.
  - The results should be ready by the end of 2010.

Structural similarity between Lithuania and Japan

- **Japan – the country of the rising sun**

- **Lithuania – the country of the rising energy projects**

THANK YOU!