Litgrid

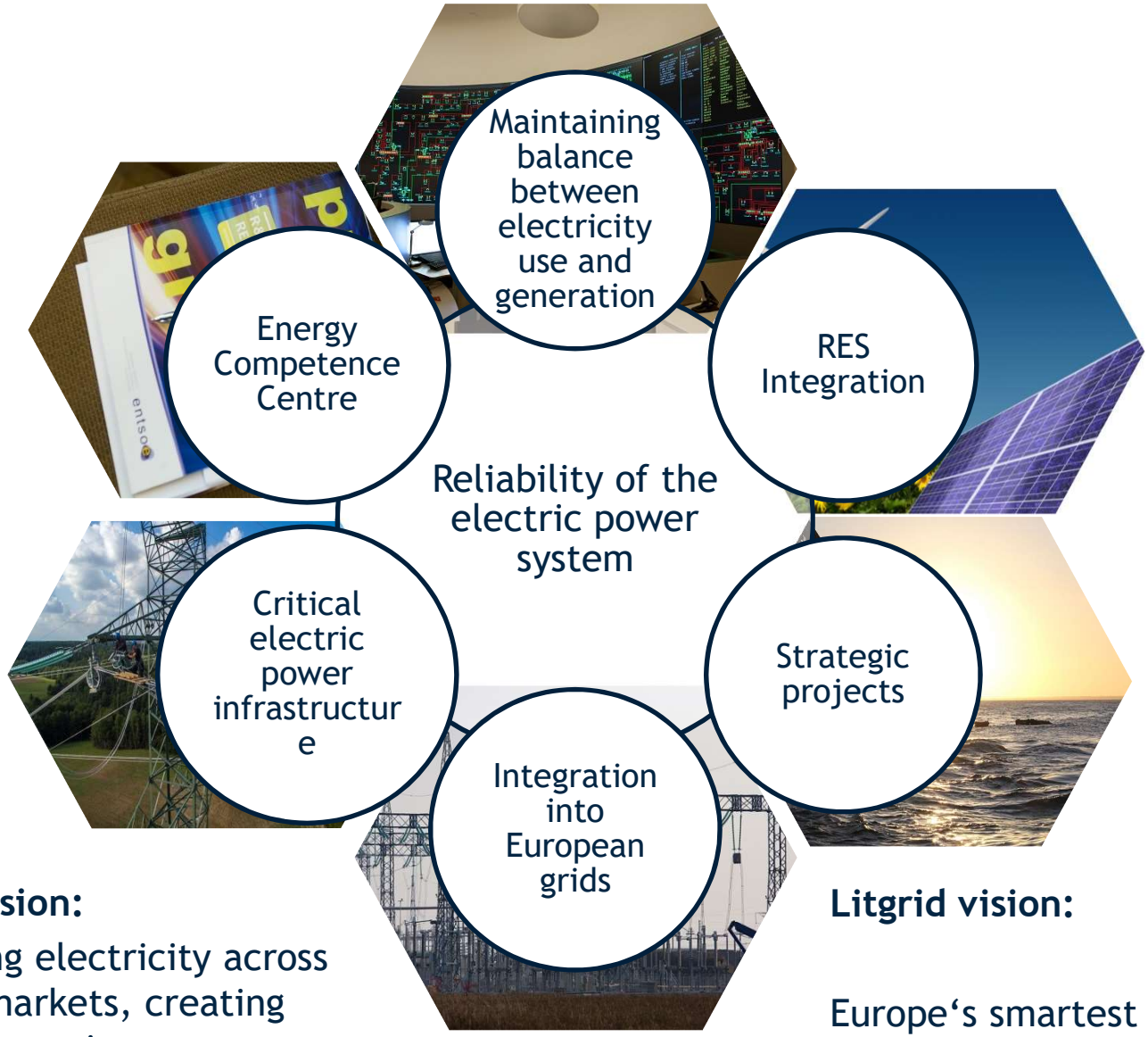
Restored Lithuania 100

„Creating Value for the Society“

Daivis Virbickas
CEO of Litgrid
European Commission Expert

11 May 2018

Litgrid



Litgrid mission:

Transmitting electricity across European markets, creating value to the society

Litgrid vision:

Europe‘s smartest TSO

Litgrid

- The average employee age – 42
- The average experience in the energy sector – 12 years
- 8 employees hold a PhD
- 73% men, 27% women
- Unique competences in implementing projects of European significance

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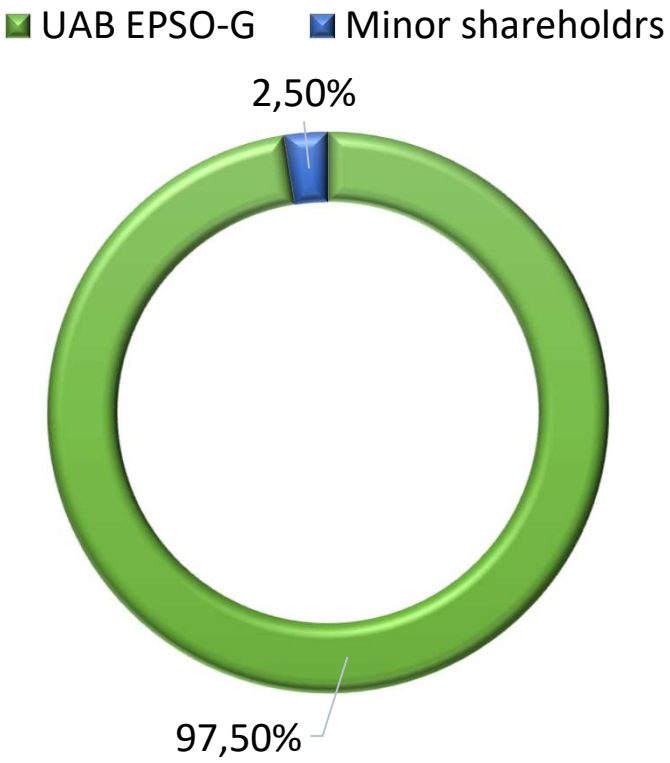
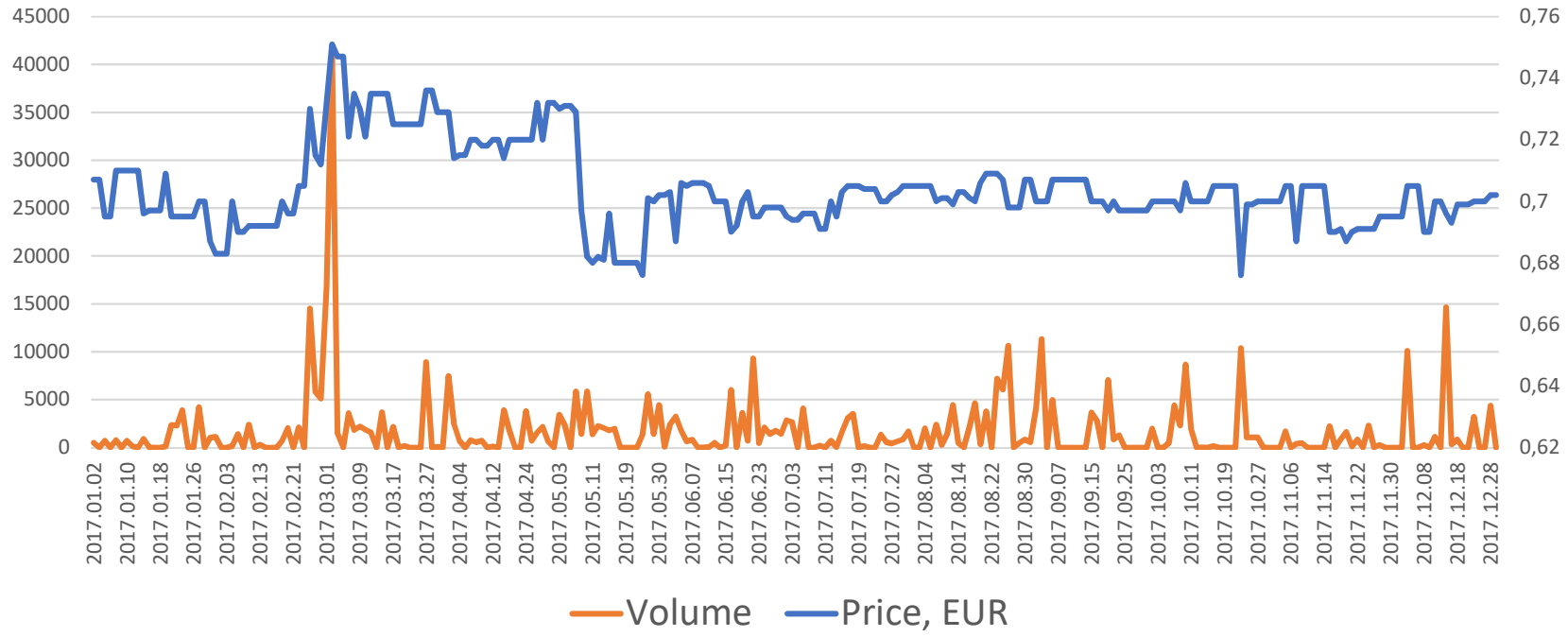
Value for Shareholders

Litgrid at NASDAQ Baltics

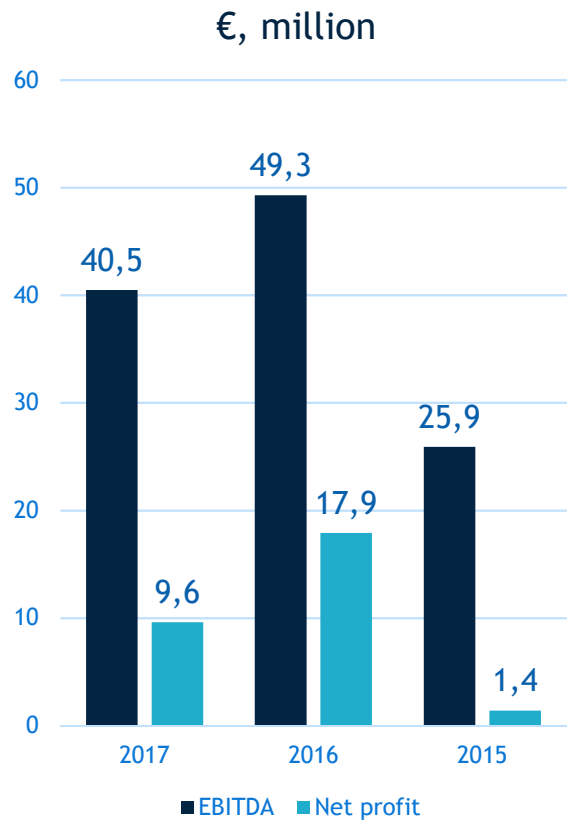


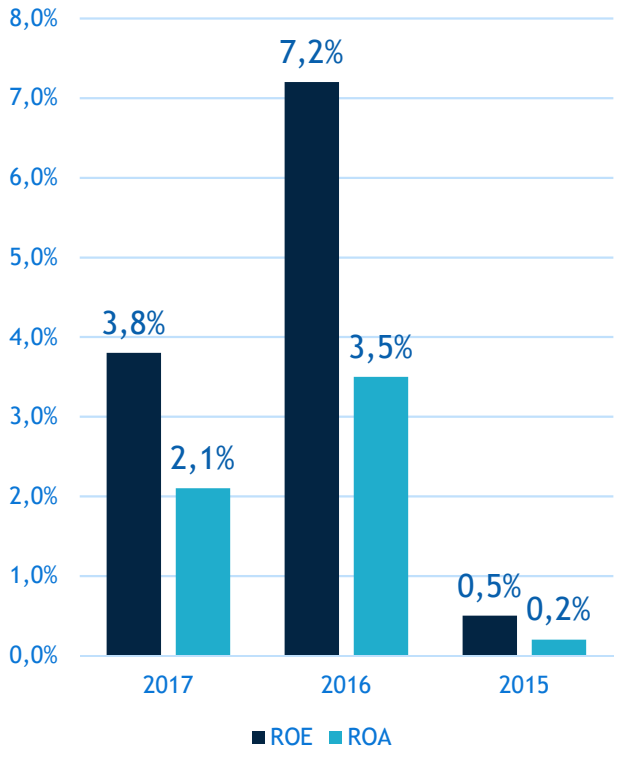
- 5 456 shareholders
- 504 331 380 shares
- € 354 million market capitalization (as of 31 December 2017)
- € 7,7 million allocated for dividends for 2017
- € 189 million allocated for dividends for 2013-2017

Price and Volume of Litgrid shares in 2017

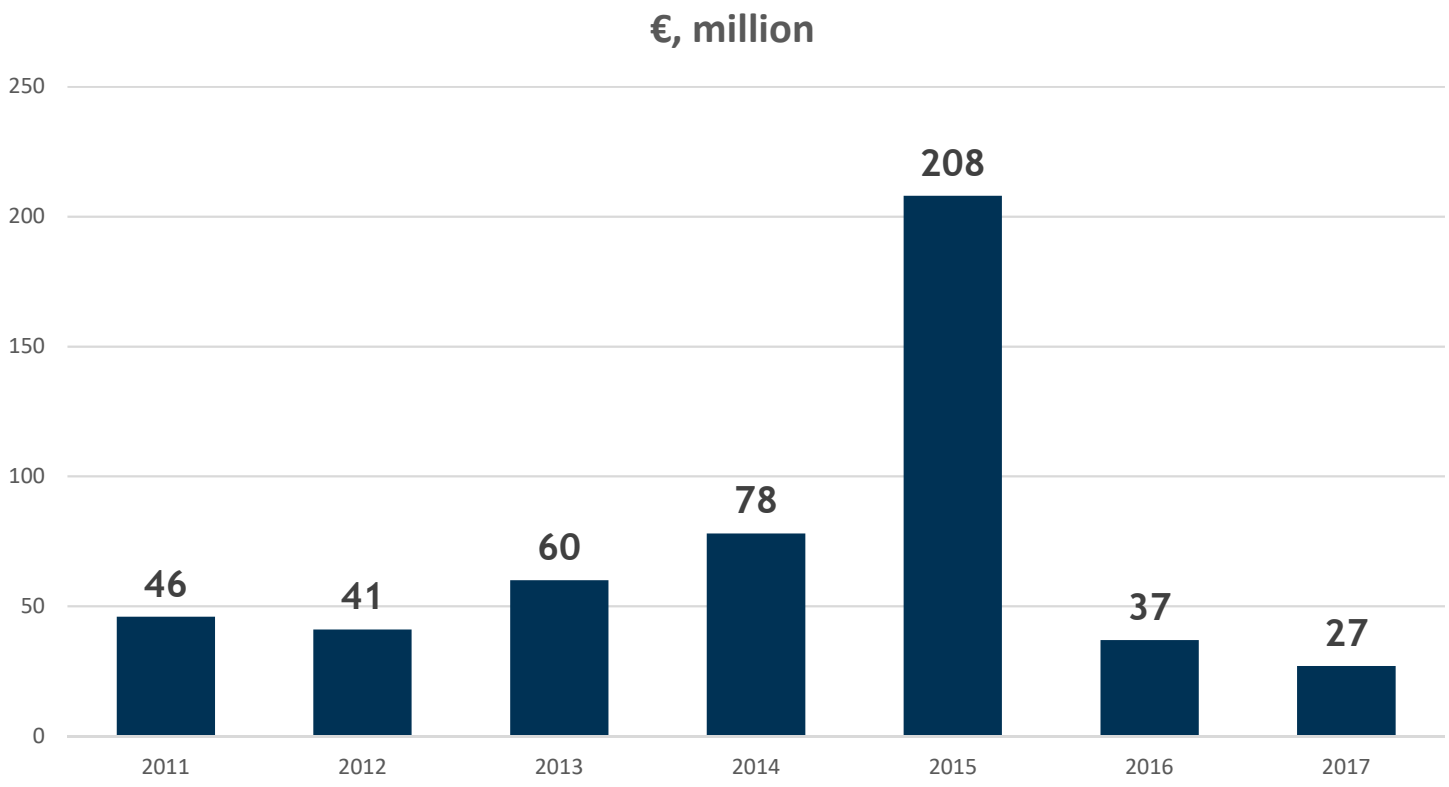


Financial Indicators



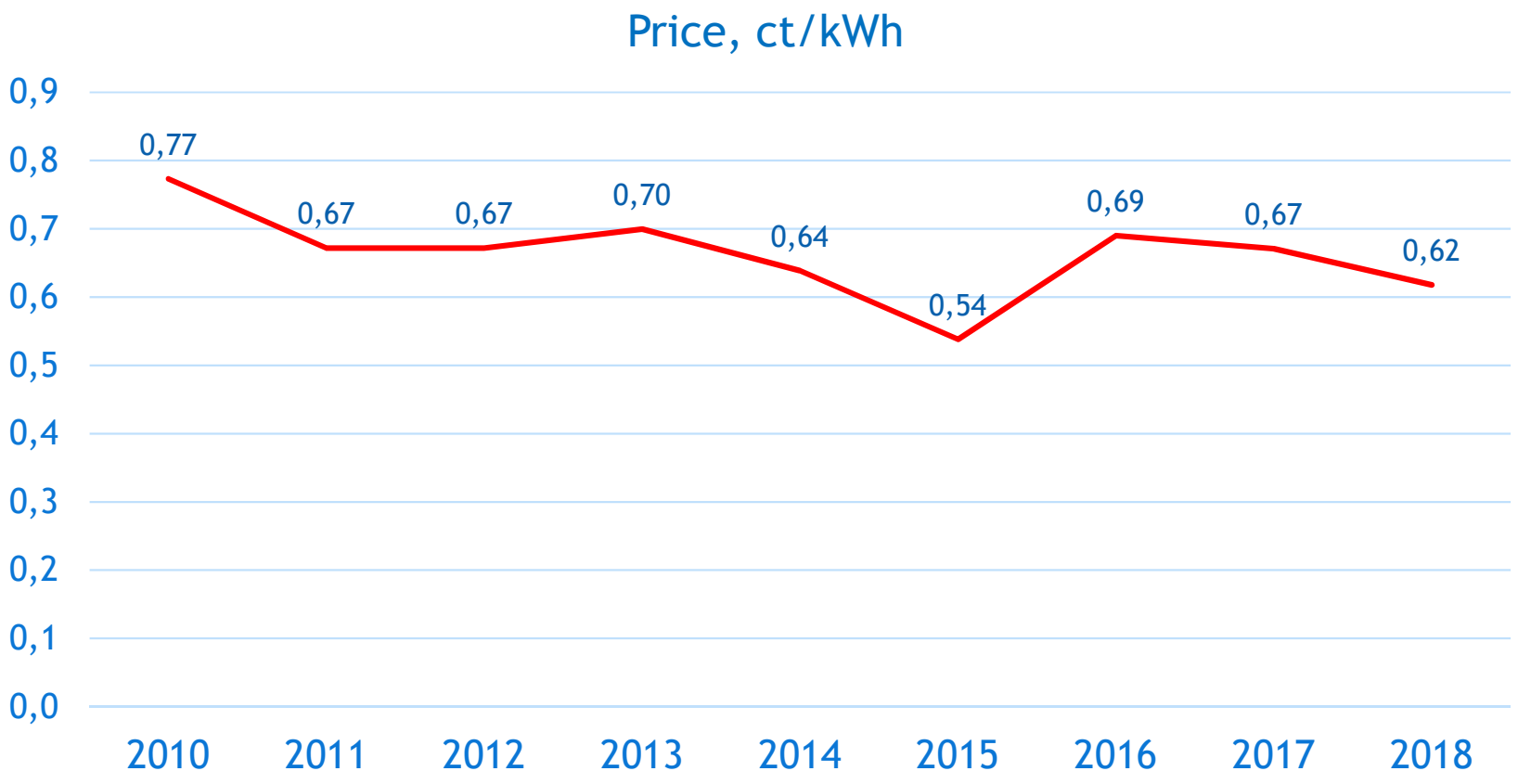


Investment to foster business opportunities and system reliability

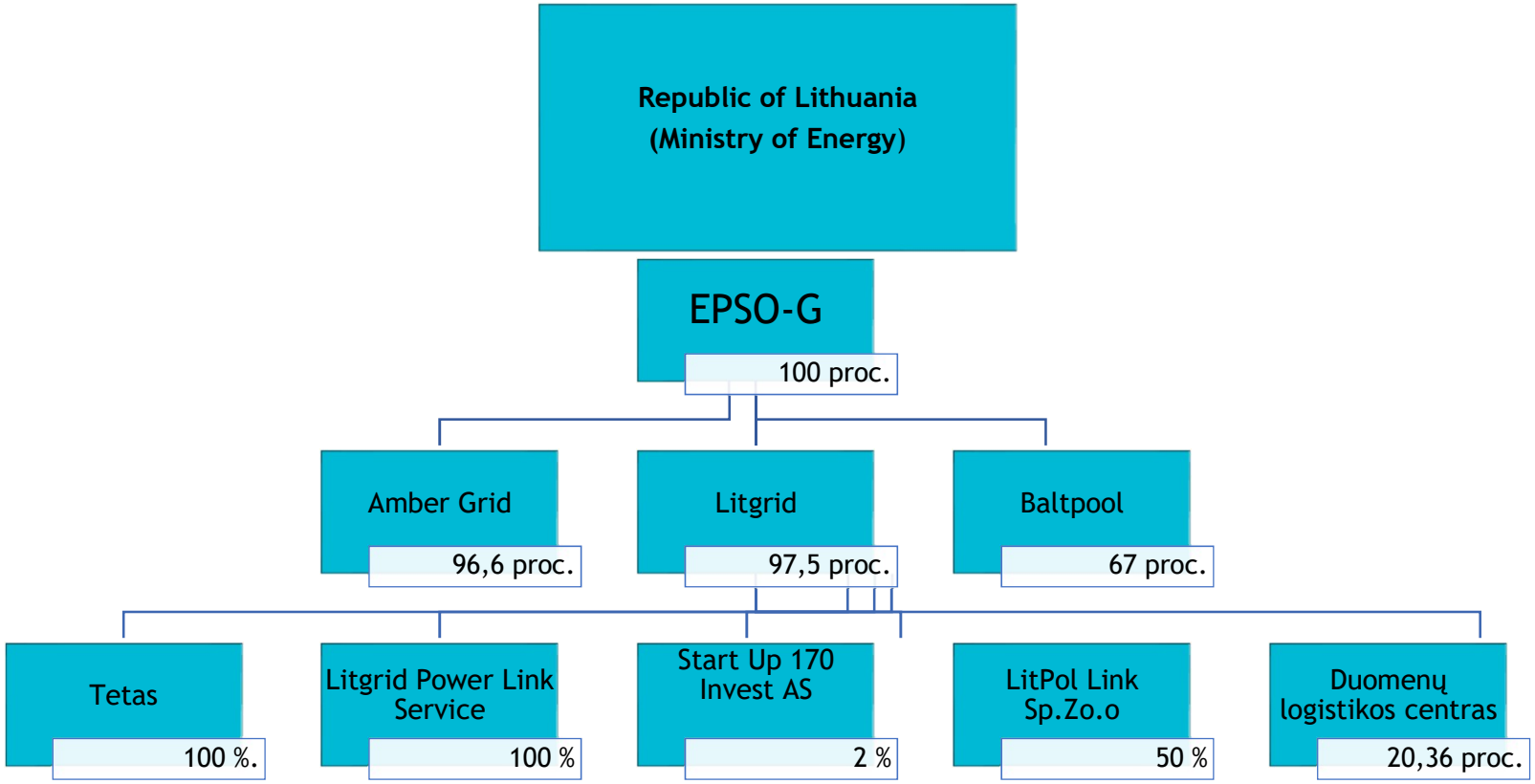


- Investment of 2014-2015 for interconnections
- Investments of 2016-2017 for grid enhancement and long-term system reliability

Lower Electricity Transmission Price



Litgrid is a Part of EPSO-G Group



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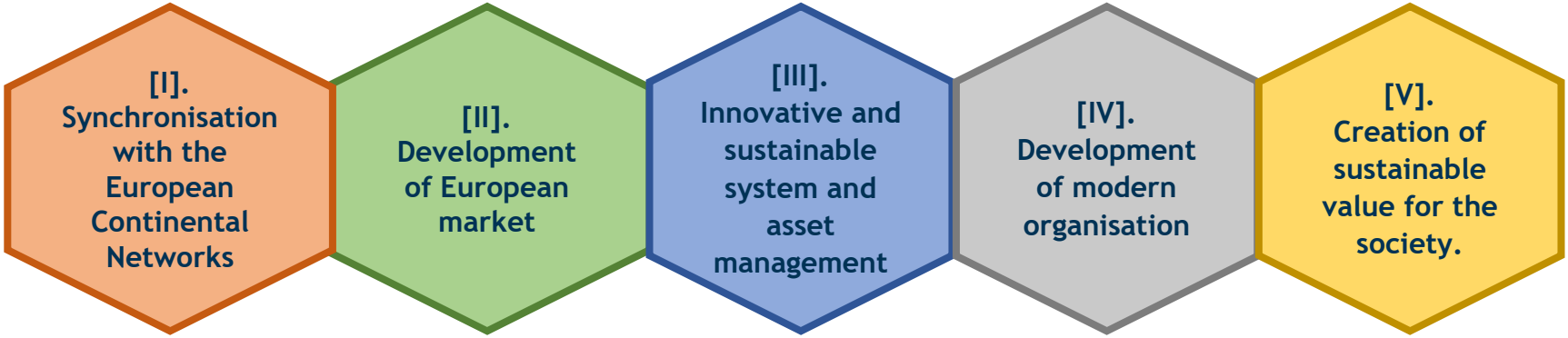
Litgrid Strategy

Litgrid Strategic Goals and Priorities



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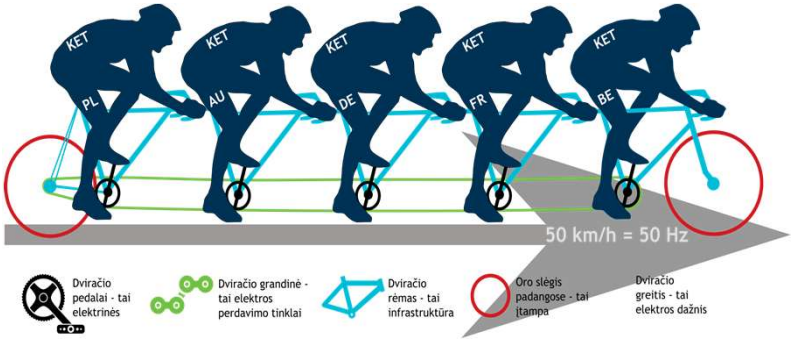
[I]. Synchronisation with the European Continental Networks

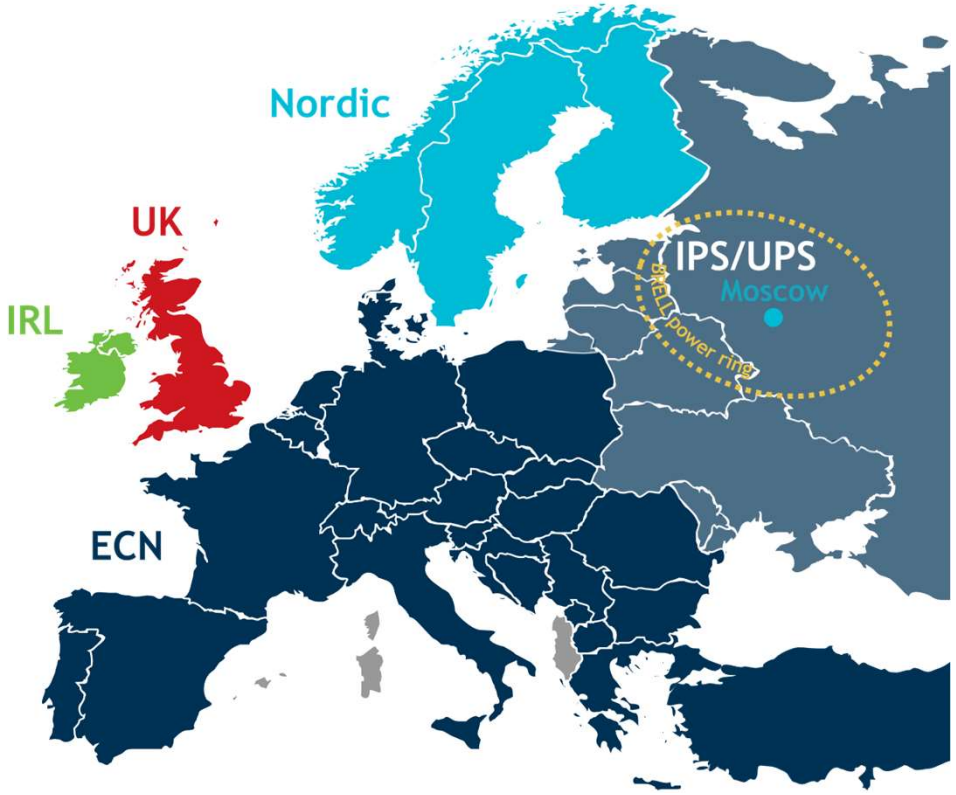
Integration into the European electricity system is the key priority of this strategy. The ultimate goal of the implementation of this priority involves synchronisation with the continental European network (CEN).

What is the Synchronisation?



- Working synchronously means complete interdependence, like riding a tandem bicycle.
- Synchronisation of electricity systems is working at the same frequency and phase.

Europe's synchronous systems



Continental European Network

1951-1958

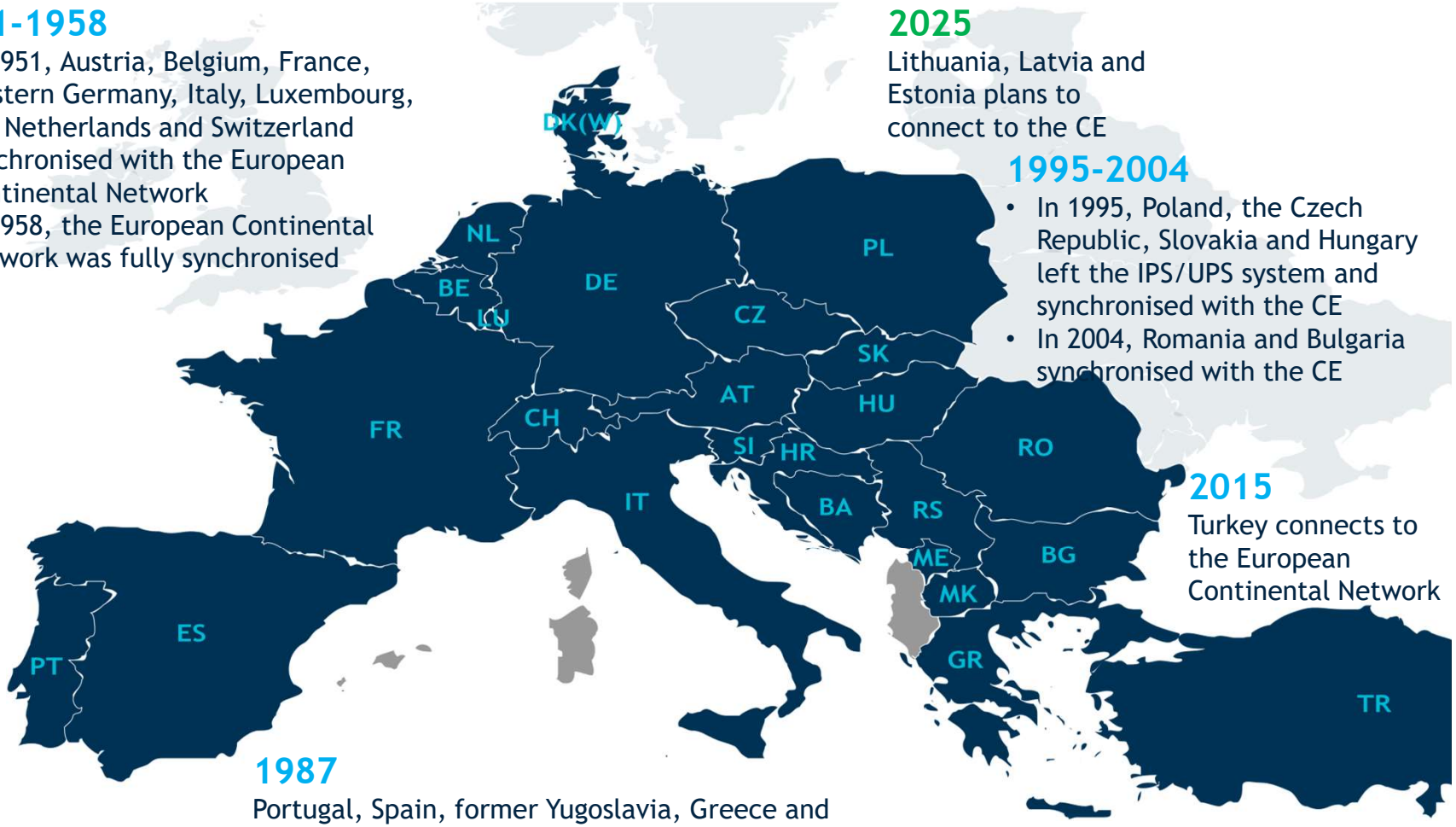
- In 1951, Austria, Belgium, France, Western Germany, Italy, Luxembourg, the Netherlands and Switzerland synchronised with the European Continental Network
- In 1958, the European Continental Network was fully synchronised

2025

Lithuania, Latvia and Estonia plans to connect to the CE

1995-2004

- In 1995, Poland, the Czech Republic, Slovakia and Hungary left the IPS/UPS system and synchronised with the CE
- In 2004, Romania and Bulgaria synchronised with the CE



2015

Turkey connects to the European Continental Network

1987

Portugal, Spain, former Yugoslavia, Greece and Albania synchronised with the European Continental Network

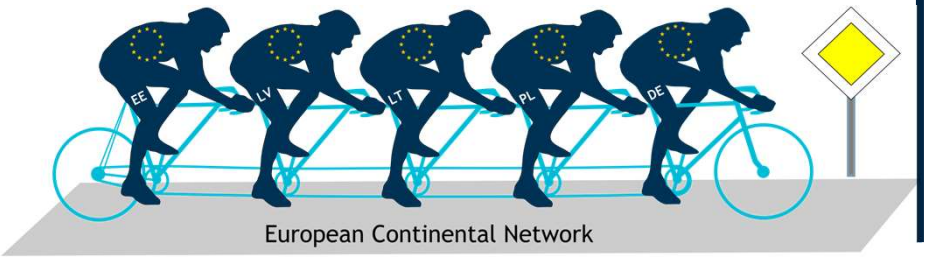
The coming 10 years' interdependency scenarios for Lithuania

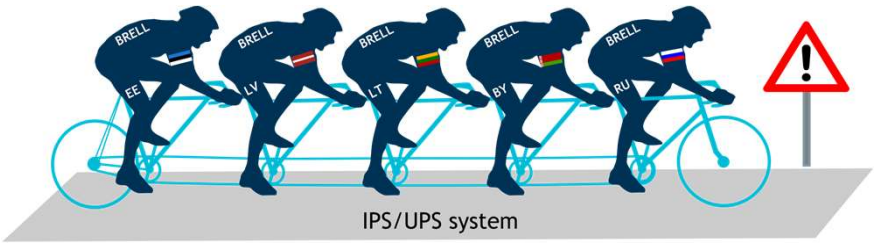
In EU (LT):
Well developed infrastructure

With 3rd countries: ?

In EU (LT): EU Network Codes

With 3rd countries: ?

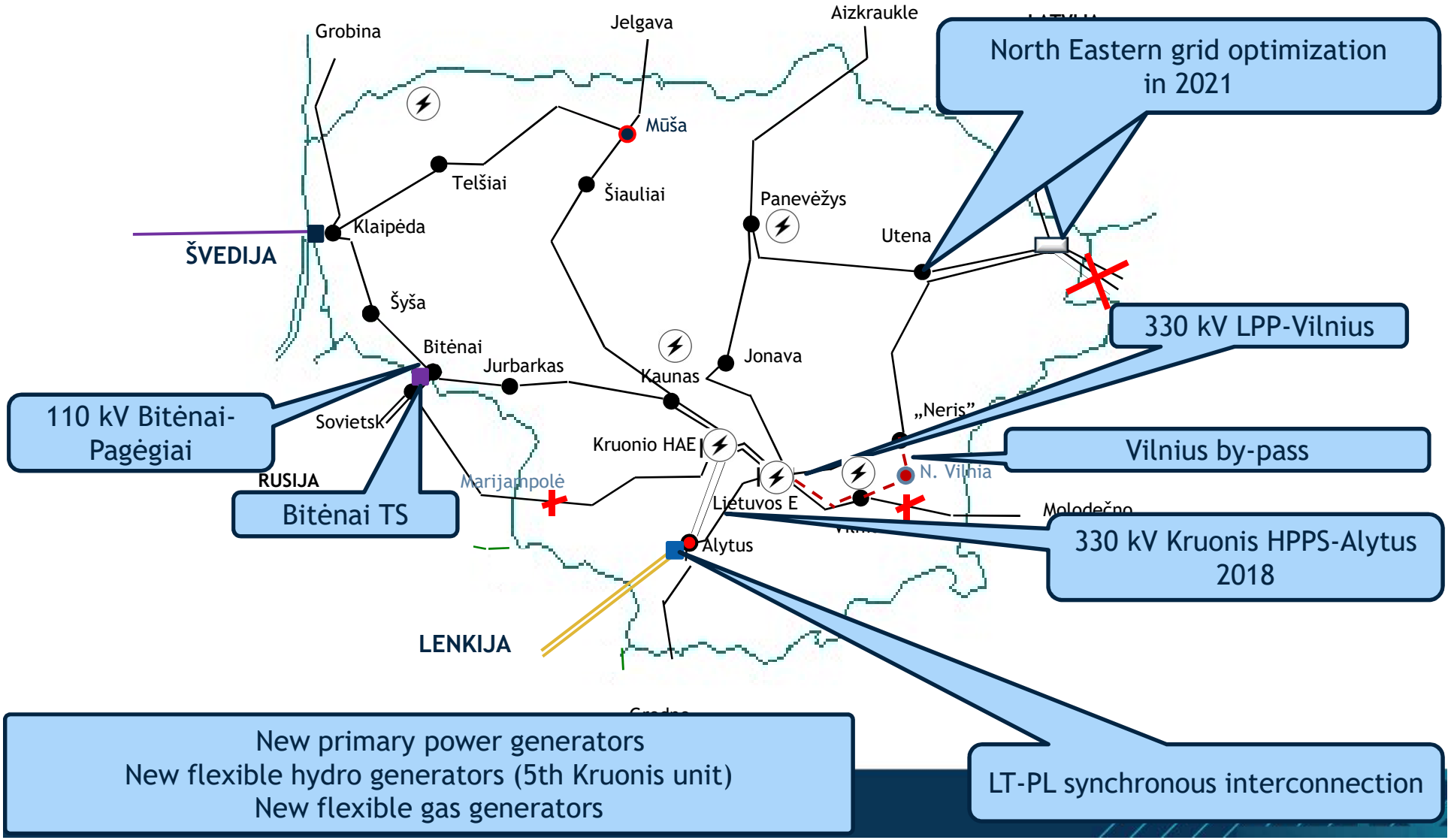




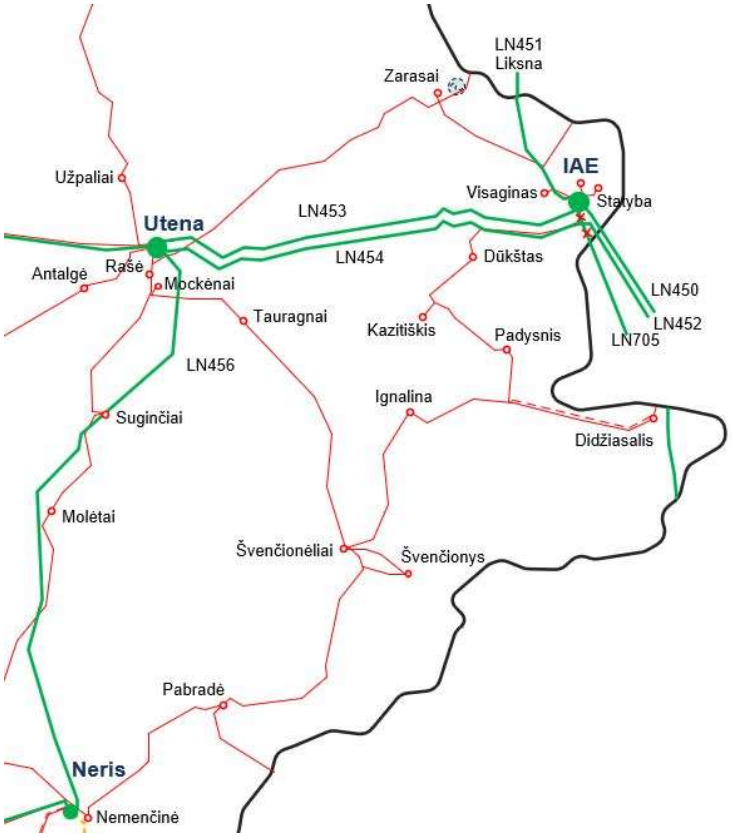
IPS/UPS network is centralised. Frequency is controlled from Moscow

CEN network is de-centralised. We will control frequency ourselves

Reinforcing grid for the synchronization



North Eastern Grid Optimization

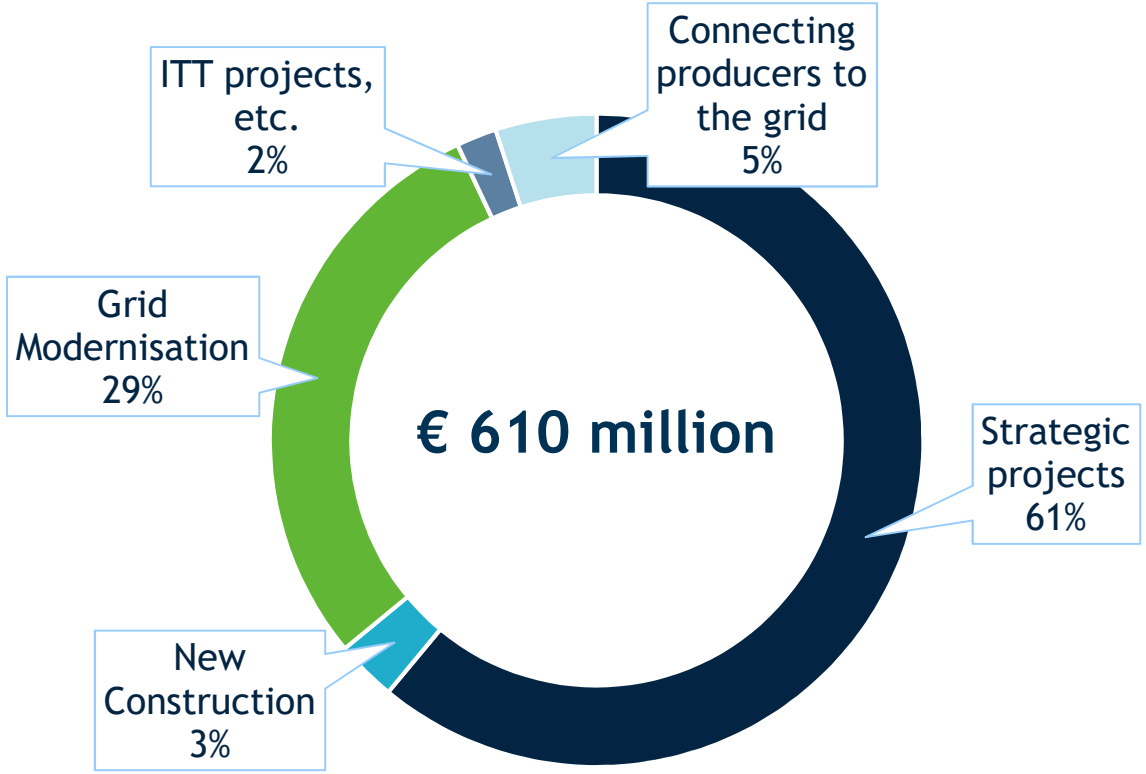


- North Eastern grid will be prepared for the Baltic isolated mode and asynchronous operations with IPS/UPS
- Flexibility in Lithuanian electricity system daily operations
- Significant savings – up to 12 times lower maintenance costs

Preparing Eastern Lithuanian Grid for synchronisation - €18 million cost saving

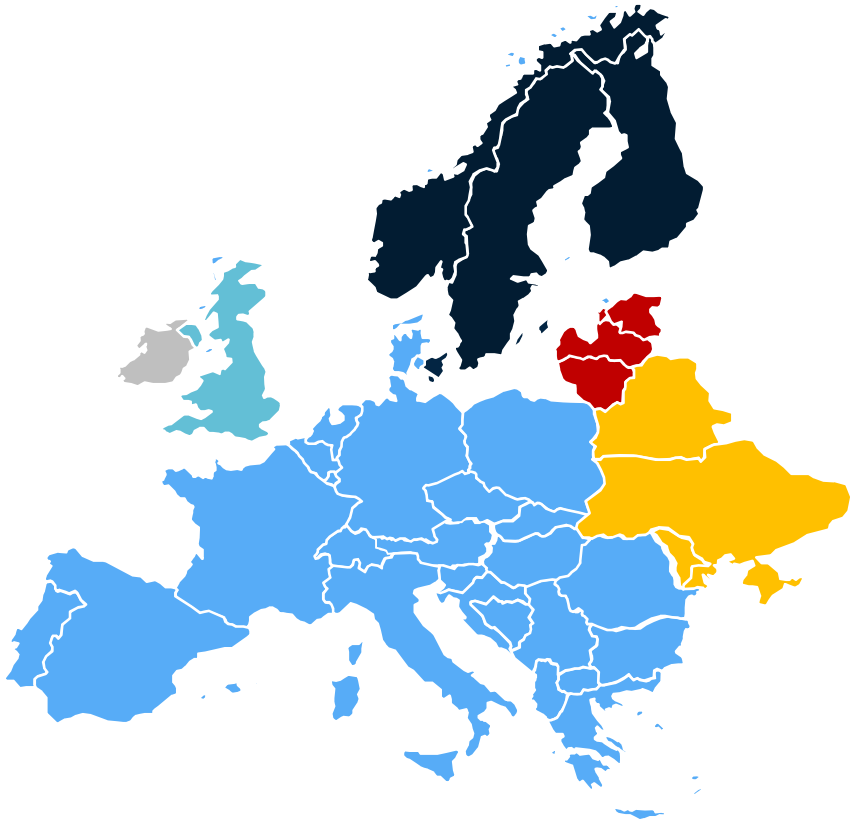
- Partnership with the Distribution system operator **ESO**
- Reliable supply of electricity in Eastern Lithuania (Medininkai and Kalveliai substations)
- €19 million cost saving
- Project to be completed in 2020

Ivestments Planned for 2017-2026



Baltic power system operations in isolation to be tested in 2019

- Operations in the isolated mode – a must before synchronizing to continental European system
- After the successful tests – in-depth analysis and decisions for additional measures to strengthen the system
- Test will be run in June 2019
- Test will last 18 hours



Baltic‘s Electricity Path to Europe is via Poland

- Start in 2025 with the double-circuit Lit Pol Link:
  - Thermal capacity of the Alytus-Elk interconnection is 2 400 MW
  - 500 MW HVDC converter station could be switched to Alytus-Grodno line. Possibility to ensure exchange of system services between Kaliningrad and Belarus
- New start after the synchronization. Joint development of Baltic and Polish systems (including LitPol Link 2)

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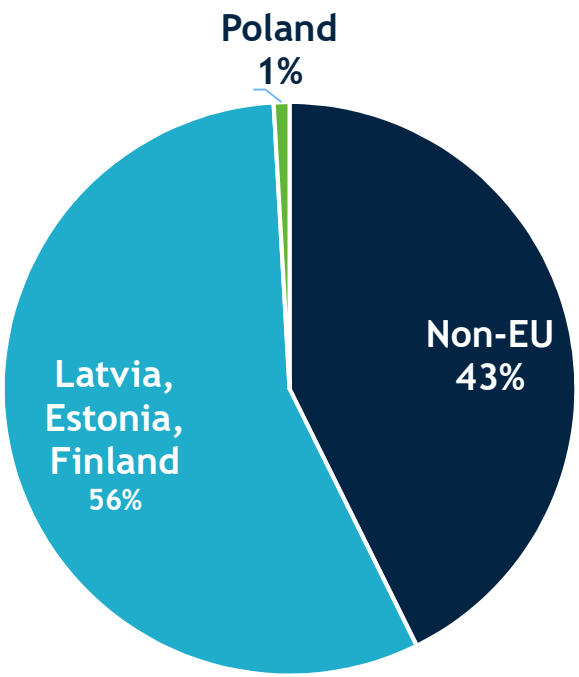
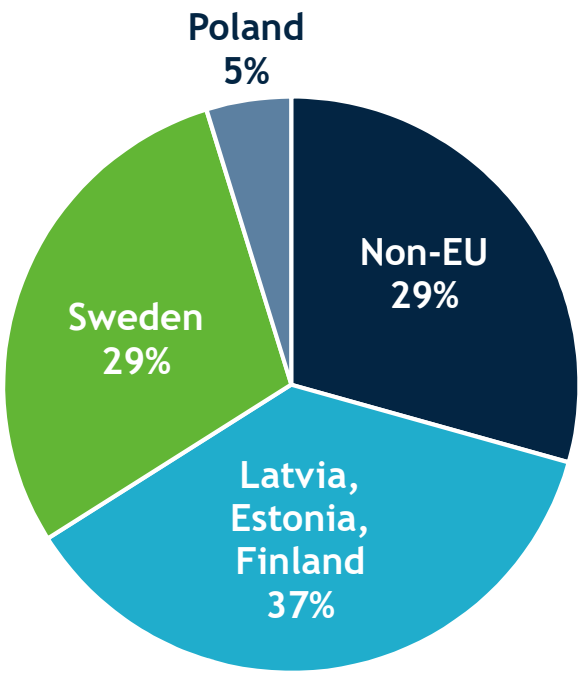
[II]. Development of European market

The liberalisation of the electricity market and its integration boosts competition and new opportunities for Lithuania.

Opportunity to Choose

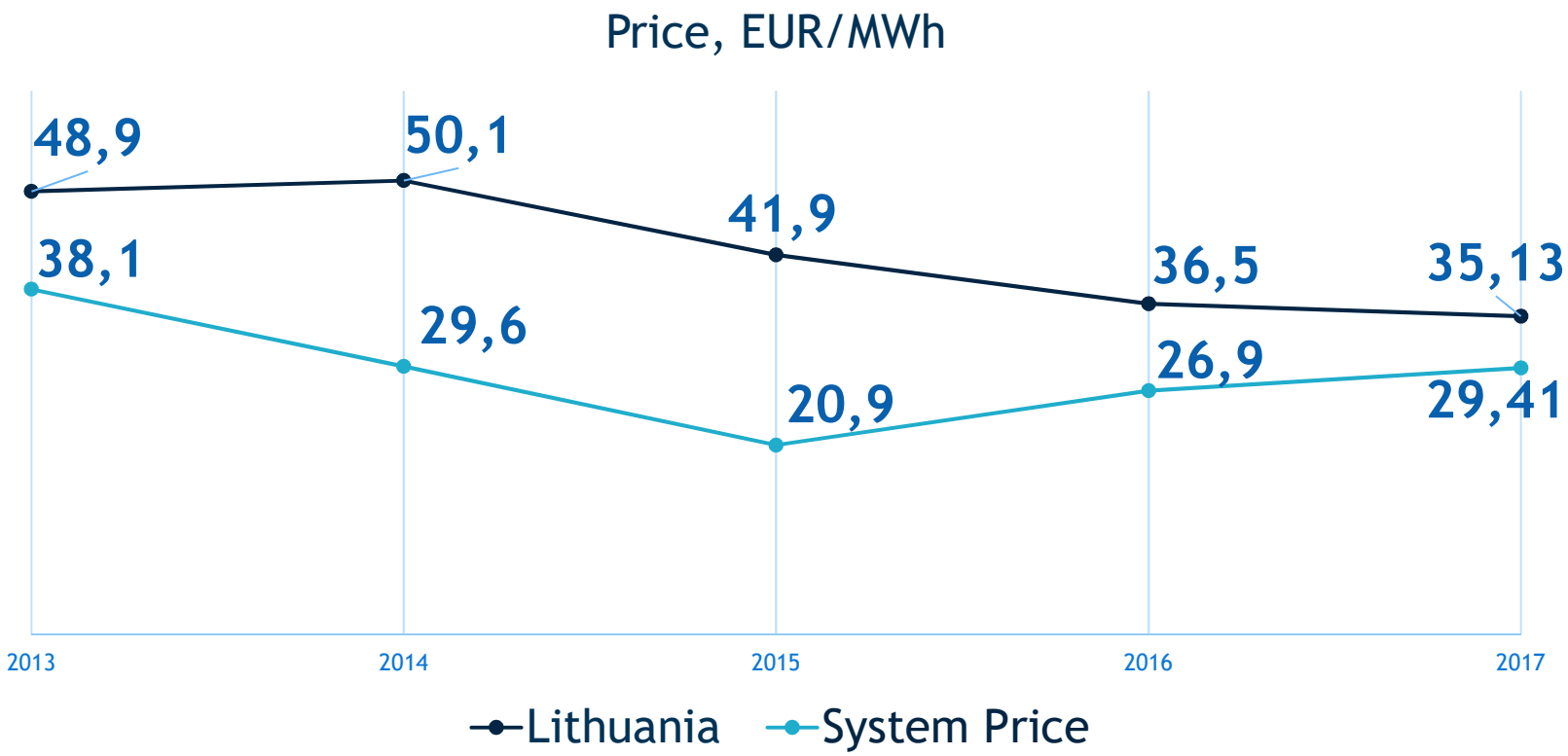


2015 vs 2017



Diversified import capabilities allow to purchase cheapest imported energy from other market areas

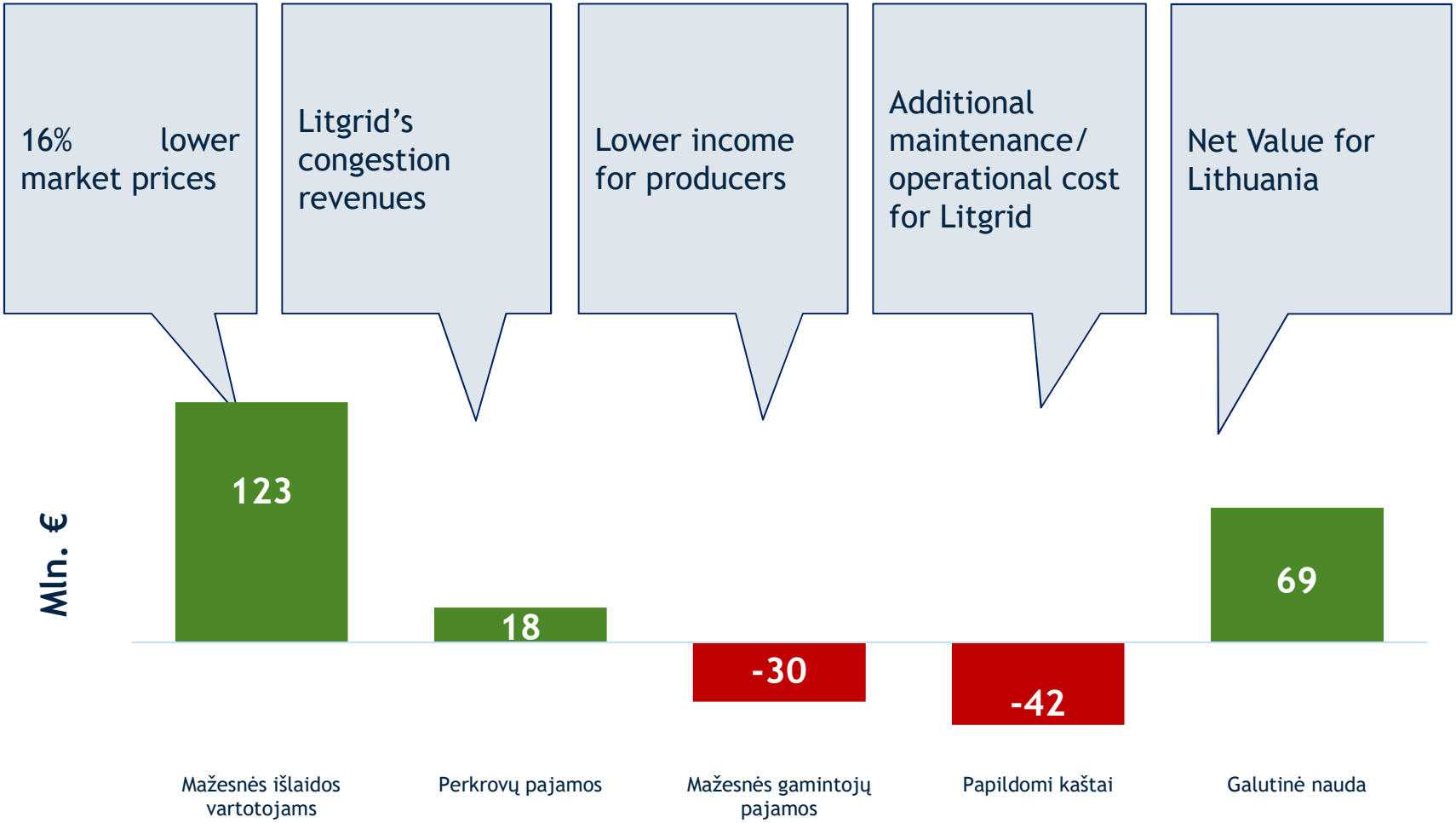
Dynamics of Market Prices Since the Start of Nord Pool in Lithuania



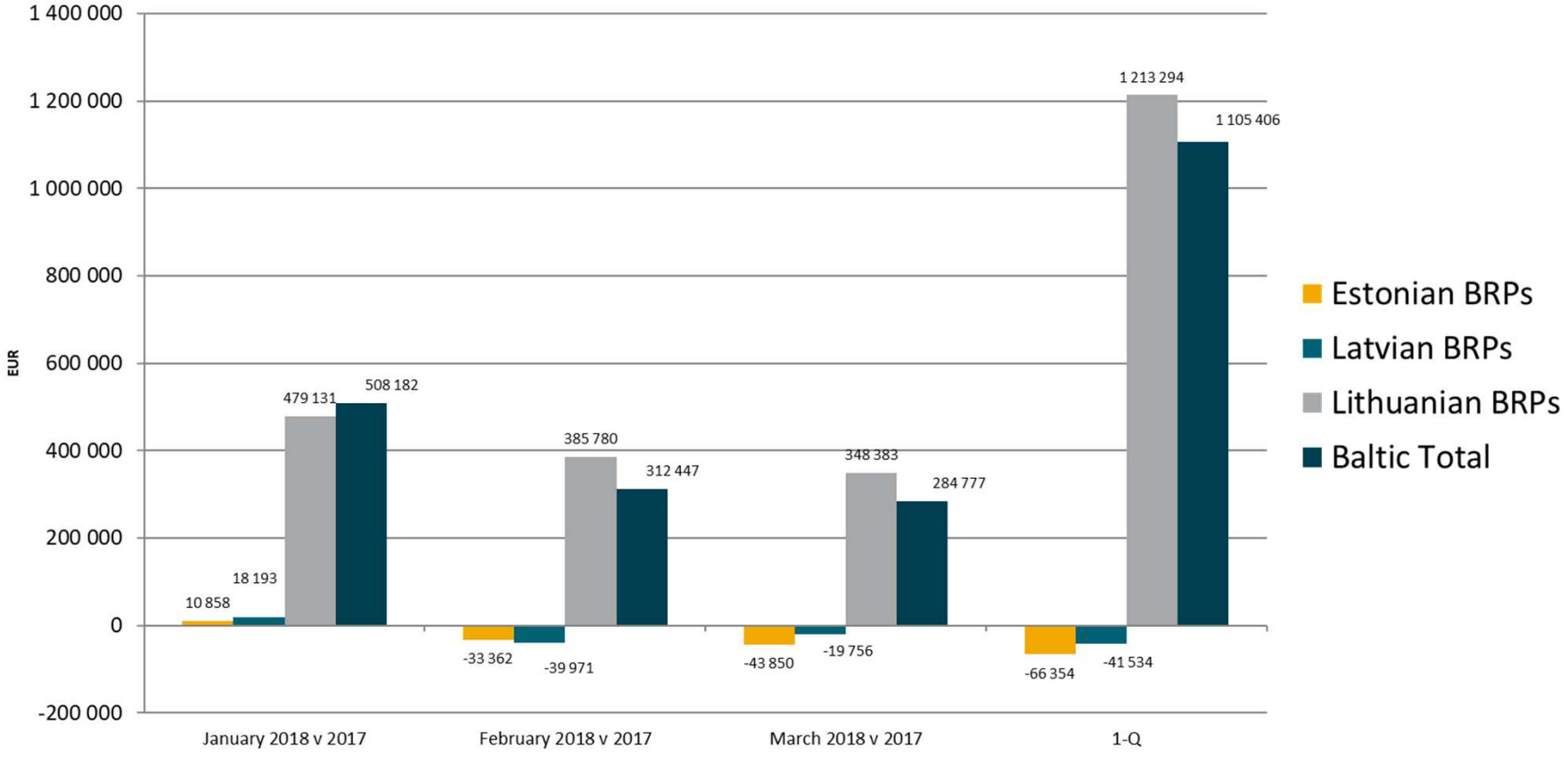
Record Low Price 10 May 2018

- Average price in Lithuania in 2017 –35.13 EUR/MWh

Value of NordBalt and LitPol Link since 2016

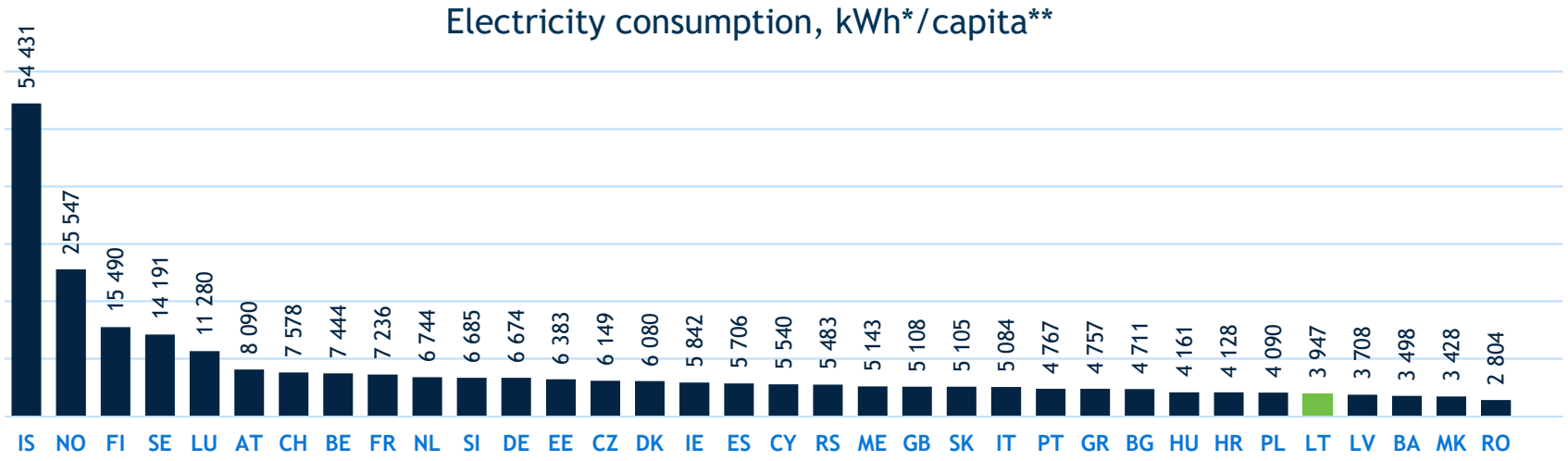


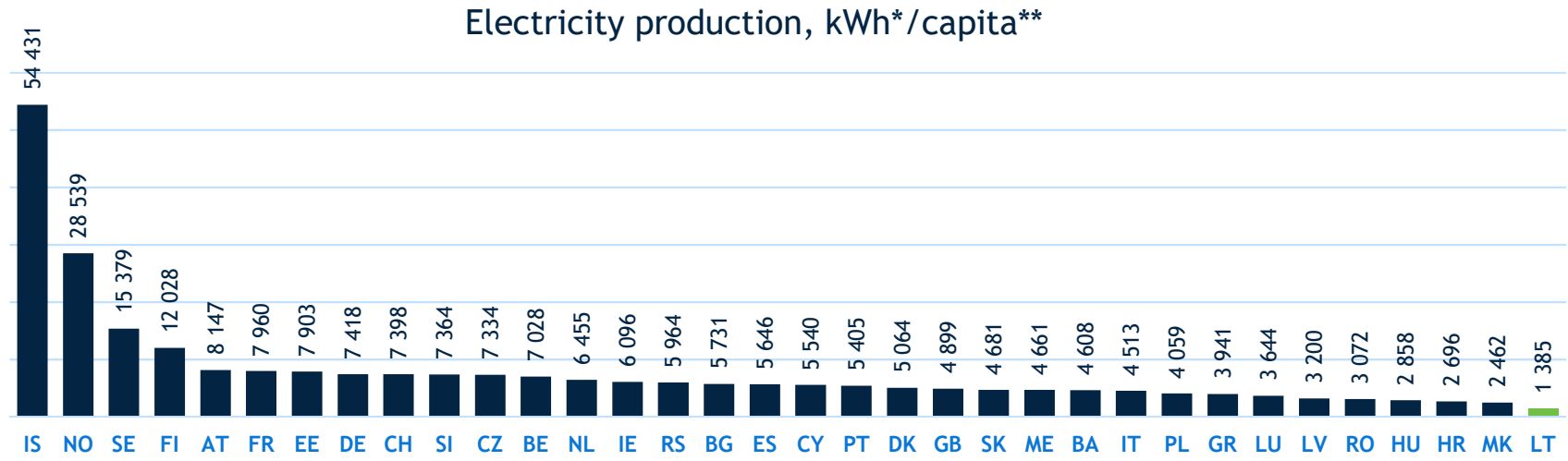
Savings in Balancing Market 2017Q1 vs 2018Q1



Total harmonized Baltic balancing market benefit in 2018Q1 €1,1 million
Projected annual benefit – approx. €4 million

Consumption and Production

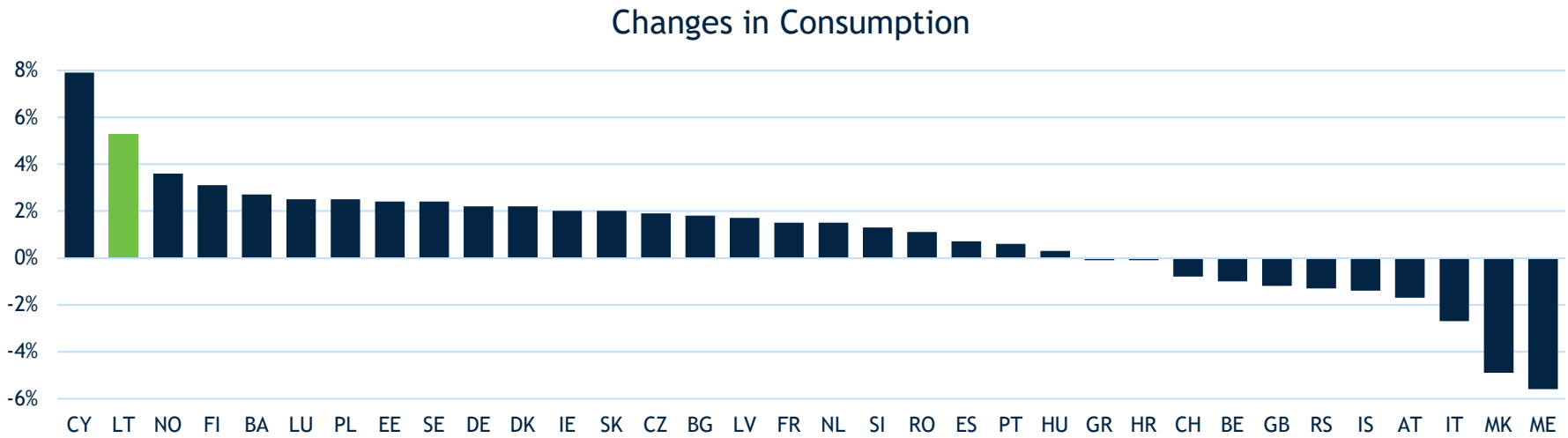


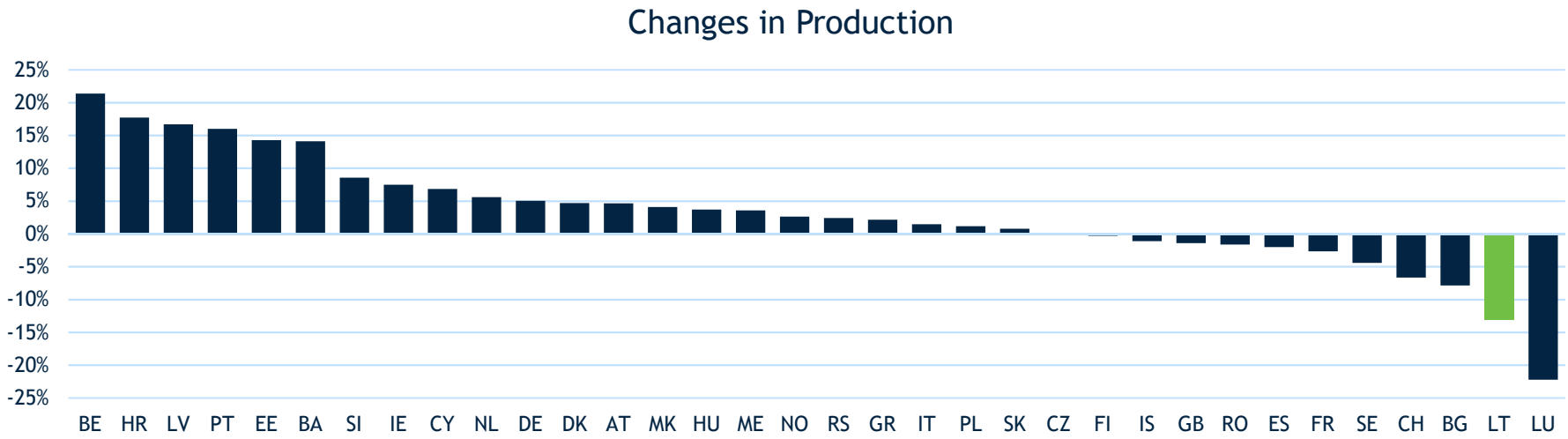


Source: ENTSO-E Statistical Factsheet (2016)

**Source: Eurostat (2016)

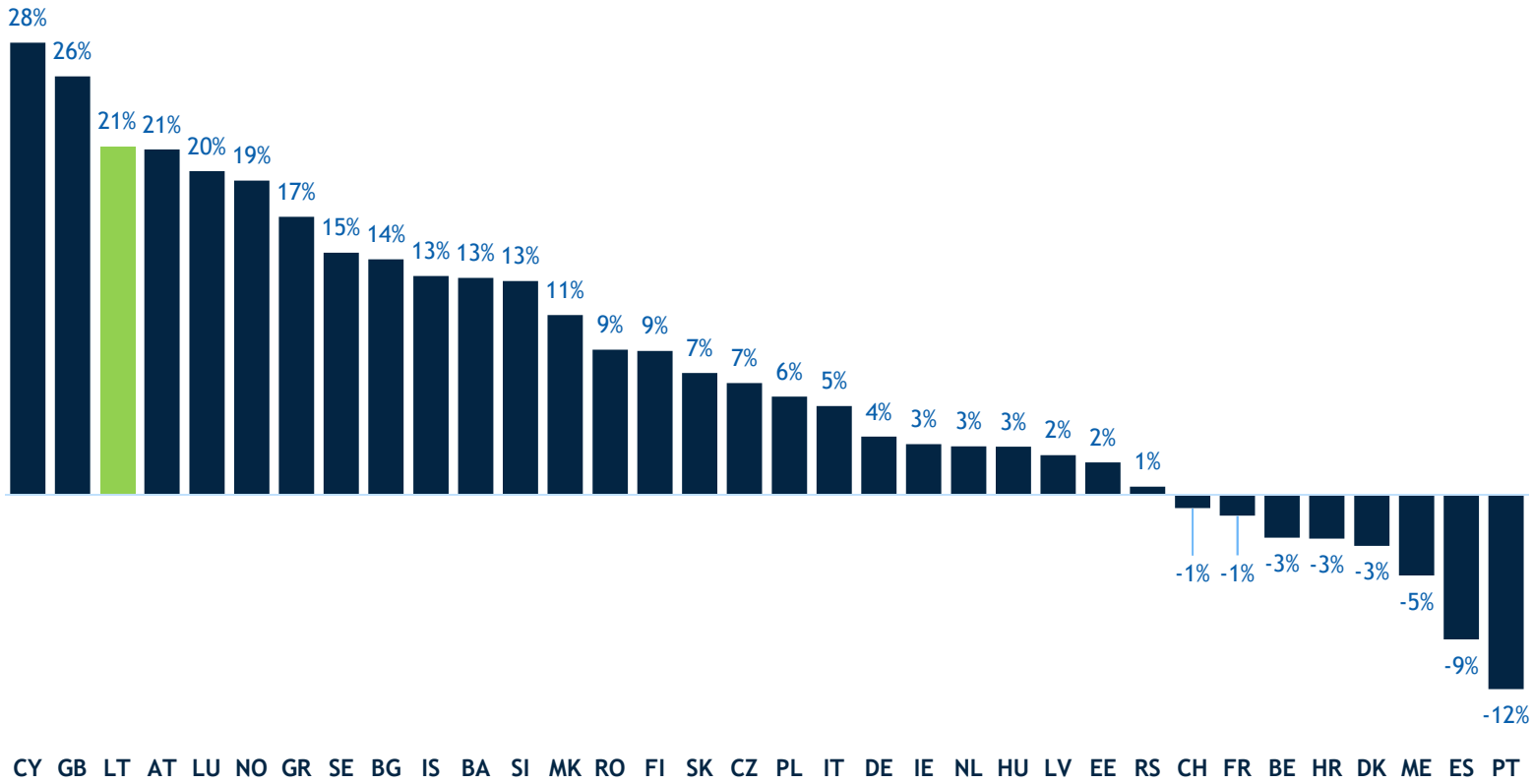
Changes in Production and Consumption





Source: ENTSO-E Statistical Factsheet (2016)

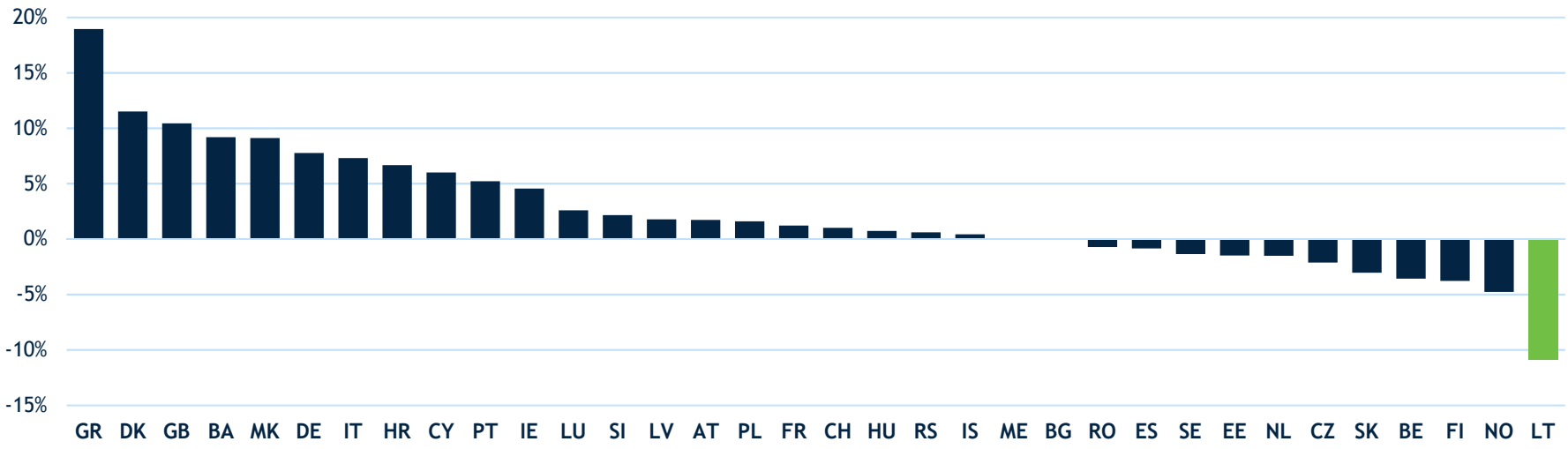
Demand for the Transmission Grid Capacities



The record peak load in Lithuania in winter 2018 reached almost 2 GW.

Source: ENTSO-E Statistical Factsheet (2009-2016)

Changes in Production capacities

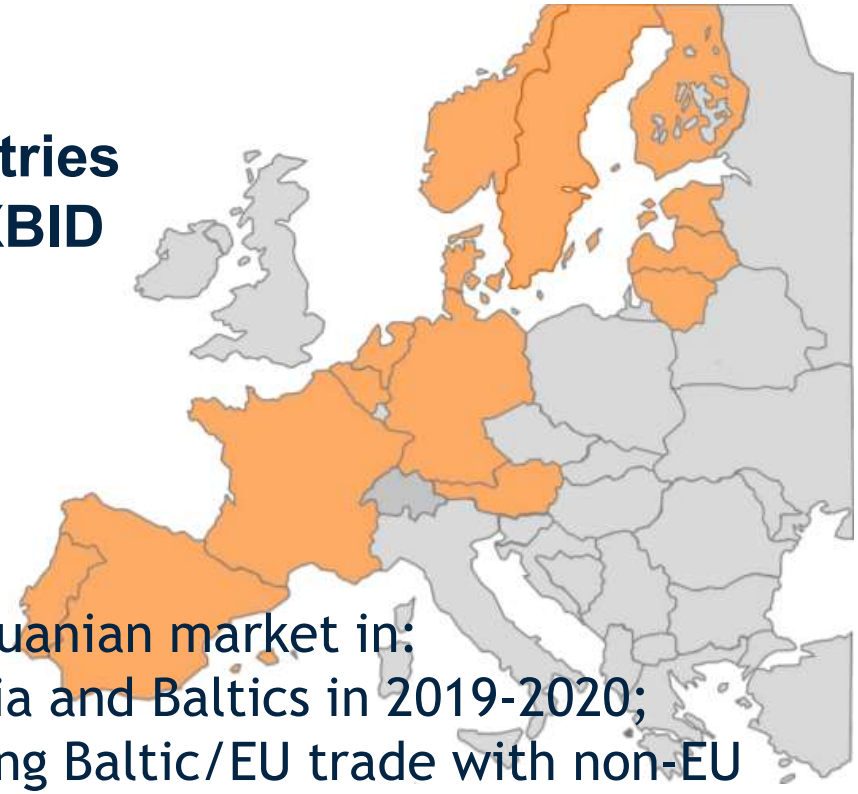


Source: ENTSO-E Statistical Factsheet (2016)

Market Development. Next Steps

We represent interests of Lithuania in preparing and implementing EU Network Codes

Lithuania is among the first countries to be integrated in the common XBID market – 12 June 2018.



We will further develop integrated Lithuanian market in:

1. Flexible services market in Lithuania and Baltics in 2019-2020;
2. Measures ensuring non-discriminating Baltic/EU trade with non-EU countries in 2019;
3. Integrating Baltic's balancing market into common European market in 2022.

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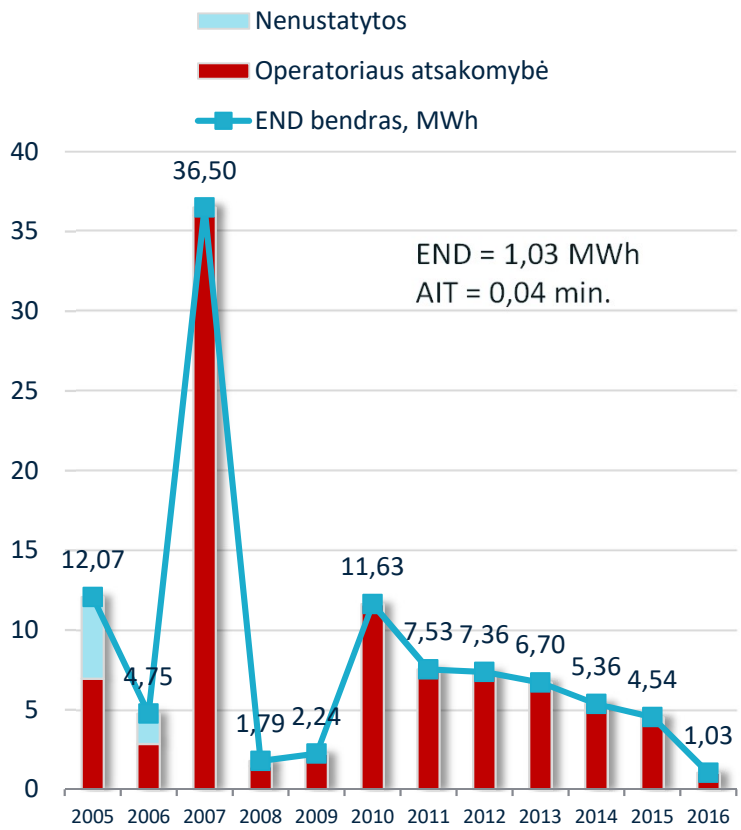
[III]. Innovative and sustainable system and asset management

Litgrid‘s transmission network is well-developed and has well-functioning links with the transmission systems of neighbouring countries and provides an opportunity to connect large consumers and electricity generators.

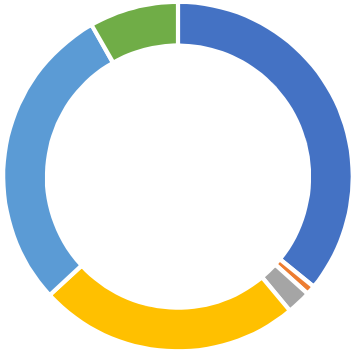
Digitalization of processes provides more opportunities and enables people work more efficiently and accomplish their tasks faster.

In charge of the strategic national assets in power sector

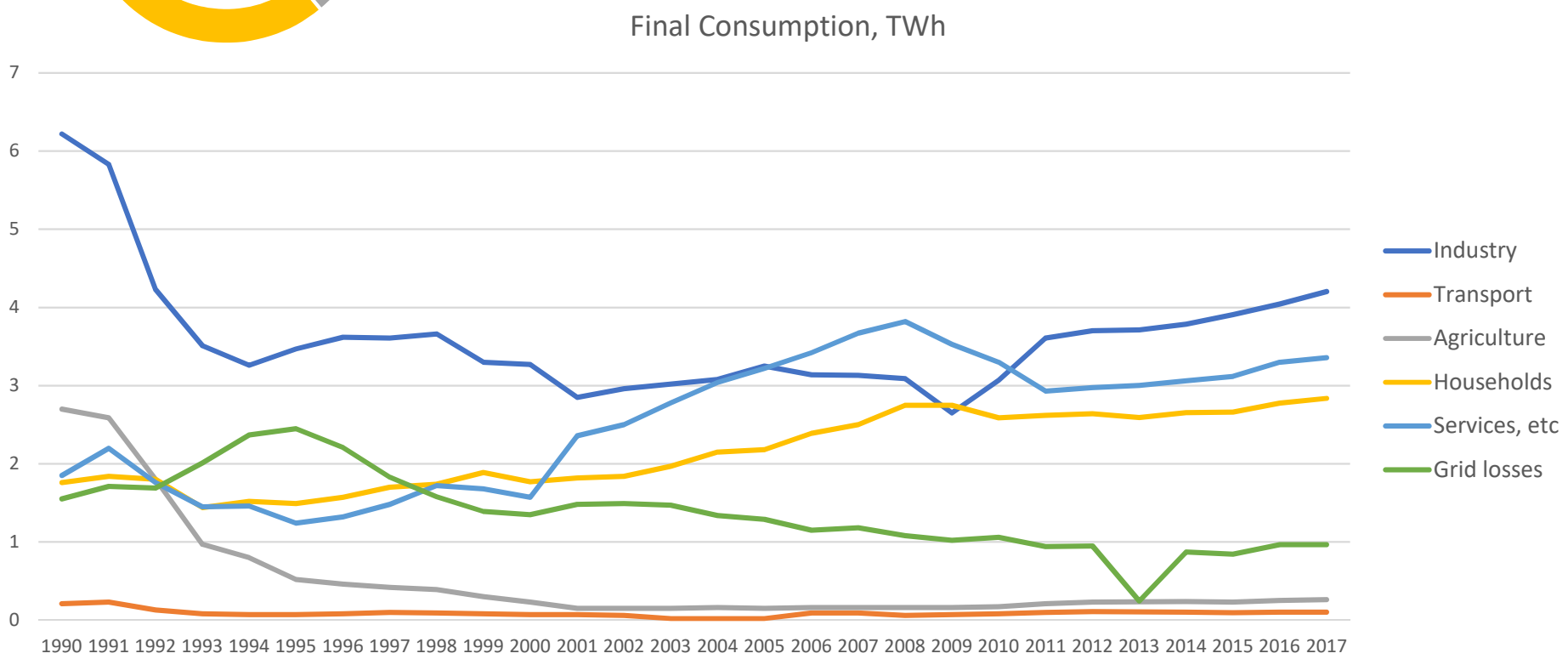


- >7 200 km of high voltage power lines
- HVDC technology
- Asynchronous interconnections with Sweden and Poland
- 15 interconnections to 3 separate synchronous areas
- Reliable and sufficient power grid
- Power system operations 24/7

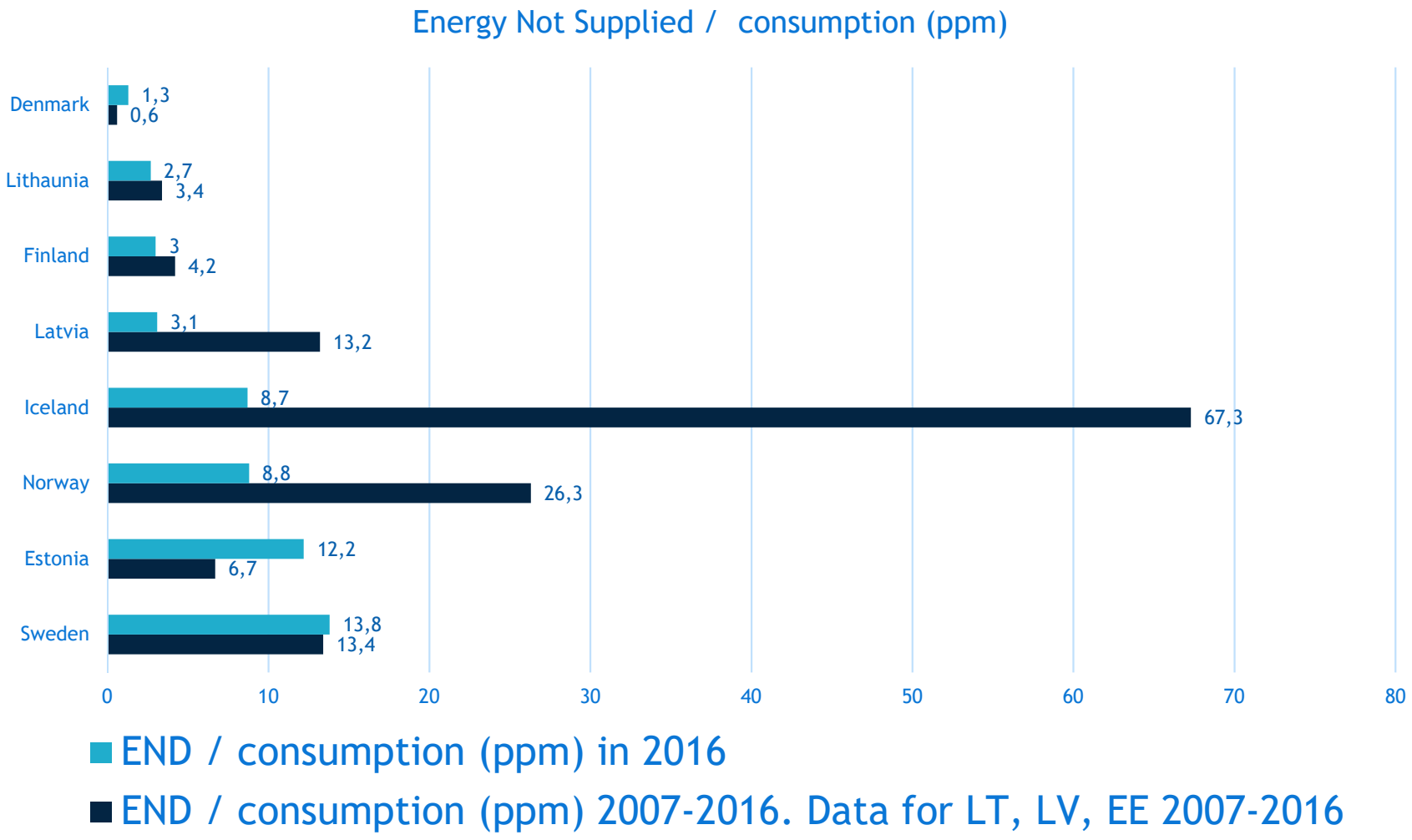
A Record Year of Electricity Consumption in 2017



- Industry consumption increased by 3,9%.
- Agriculture - 4,4%.
- Services sector – 1,8%.
- Households – 2 %.



Second Most Reliable Grid in the Region



Reliability of Interconnections Improves

LitPol Link

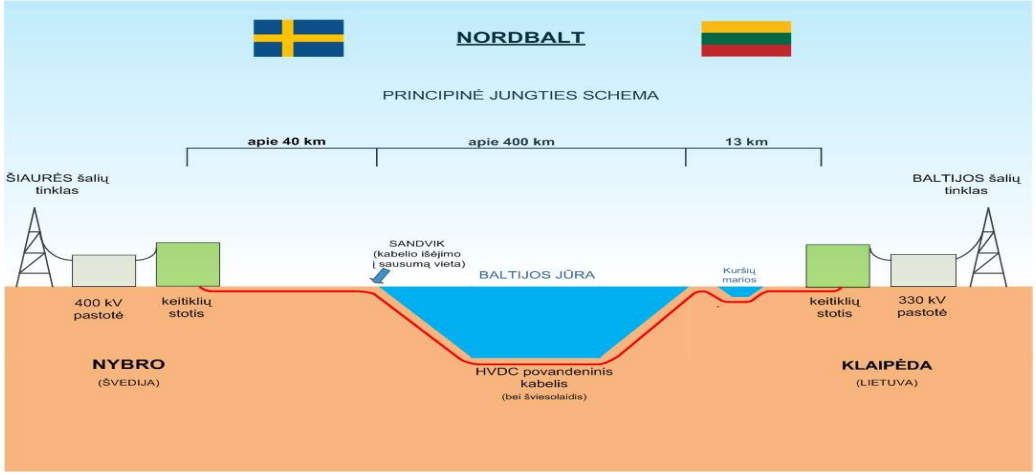
- Litgrid investment – €108 million
- Operational since 2016
- Capacity (BtB) 500 MW
- Thermal power 2400 MW
- Availability in 2017– 99 %

NordBalt

- Litgrid investment – €222 million
- Operational since 2016
- Capacity 700 MW
- Availability in 2017– 84%
- Availability in 2018 Q1 – **94**%

Long-term Reliability of NordBalt

- In order to increase NordBalt's availability to the market, the replacement of the underground cable joints is planned from 30 July to 9 October 2018.



- In the longer run the more stable joint operations will cause less price fluctuations and smaller risk of energy not supplied.
- Costs covered by ABB warranty.

Litgrid

[IV]. Development of modern organisation

The modern organisation cannot operate without highly qualified professionals. Thanks to them the Company may call itself the centre of excellence.

We Are Litgrid

- 260+ professionals at Litgrid
- 96 per cent hold a university degree
- 8 employees hold a PhD
- The average employee age – 42
- The average experience in the energy sector – 12 years
- 73% men, 27% women

New Collective agreement

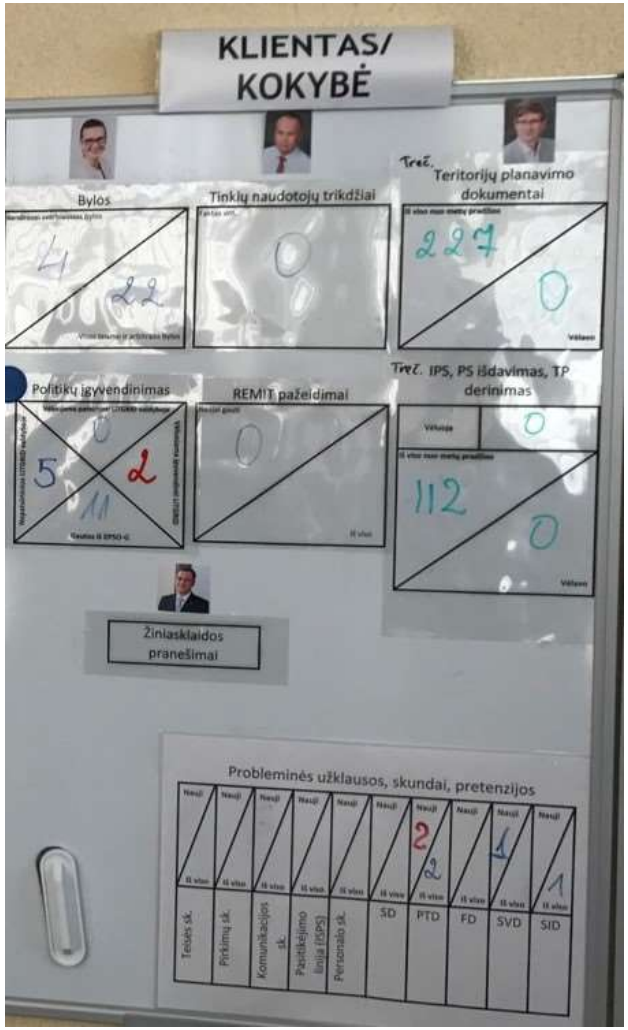
- On 20 February 2018 an updated Collective Agreement was signed
- The document defines and ensures a fair remuneration policy and balance between work and rest, regulates social and economic relations between the employer and the employee.
- Attention to families of employees.
- The Collective Agreement also contains provisions on how the Company supports employees when important or painful life events occur.
- Resources allocated for team-building events.
- Dialogue with the trade union.

Co-Operation With Universities

- Historic ties with Kaunas University of Technology.
- Co-operation agreement signed with Vilnius Gediminas Technical University in 2016.
- Litgrid participated at Career Days at KTU and VGTU.
- New co-operation agreement signed with Klaipėda University in 2017.
- 11 university students did internships.

Lean Journey

- Why did we start Lean?
  - We did not need just more efficiency, the company was profitable, but we needed efficiency at decision making in daily operations, and changes in the company culture.
- What did we do?
  - We started daily meetings, internal agreements, improvement (Kaizen) ideas implementation, cooperation (Gemba) visits.
- Results achieved:
  - 151 Ideas for improvement (Mini Kaizen) registered;
  - 47 of them implemented.



Our People About Lean

- „we do not forget now when our colleagues leave“;
- „clear terms for tasks“;
- „when we name a problem, it is easier to escalate it “;
- „there is an official way to express gratitude“;
- „clear communication channel“;
- „order, discipline“;
- „grey zones became clear;
- „we discovered people“;
- „have more contact with the superiors“;
- „problem solving is fast - „here and now““;
- „team work”
- „we all have time set for our meetings“;

- „information comes from the top and from the bottom”
- „“good “, „bad” things are measurable and discussed “;
- „less grumbling“;
- „daily cards provide useful information“ etc.

We Celebrate

Litgrid

[V].
Creation of sustainable value for the society.

Daily work of Litgrid team of professionals is coherent, persistent and often invisible and it creates sustainable value for Lithuania.

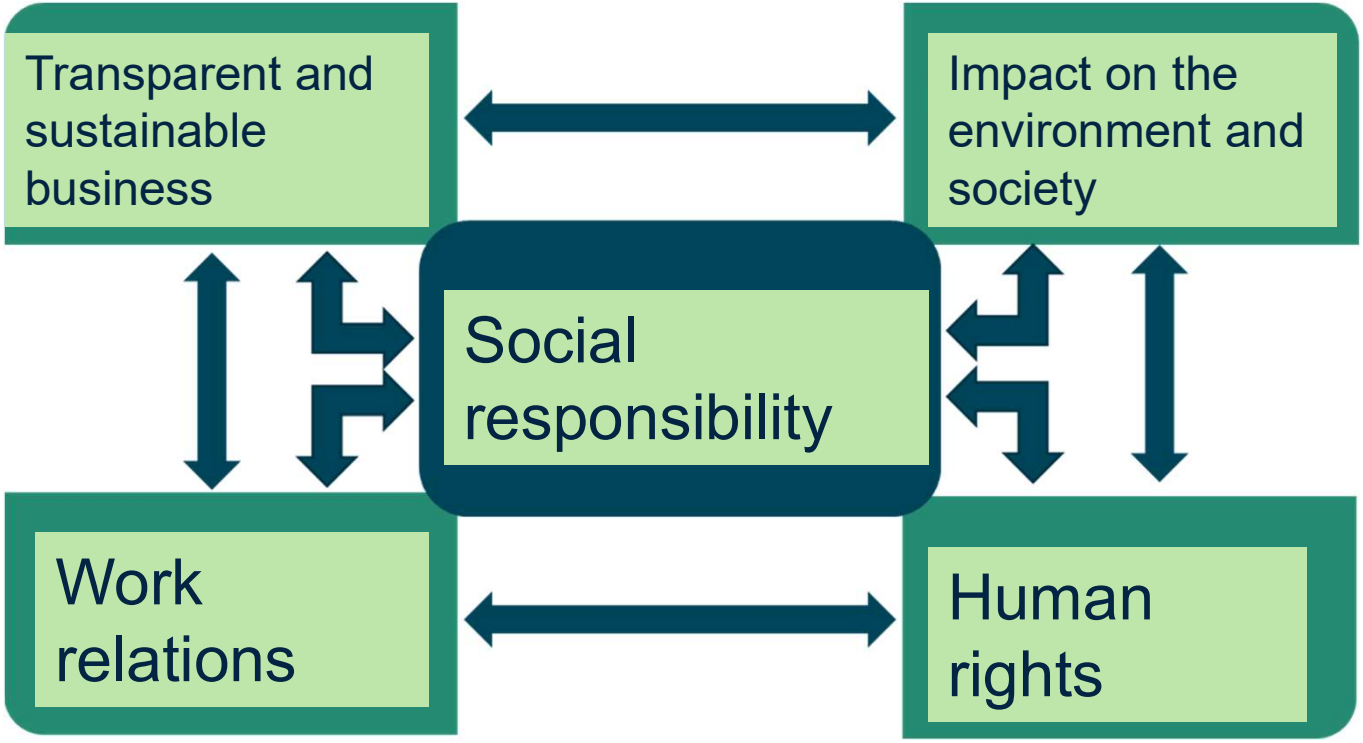
Financial indicators

- Net value of interconnections – more than €30 million annually.
- Value of the balancing market – €4 million annually.
- Reliable supply of electricity every day. €114 million of GDP is created in Lithuania every day.
- Comfort and security for people every day.

Litgrid

Responsibility

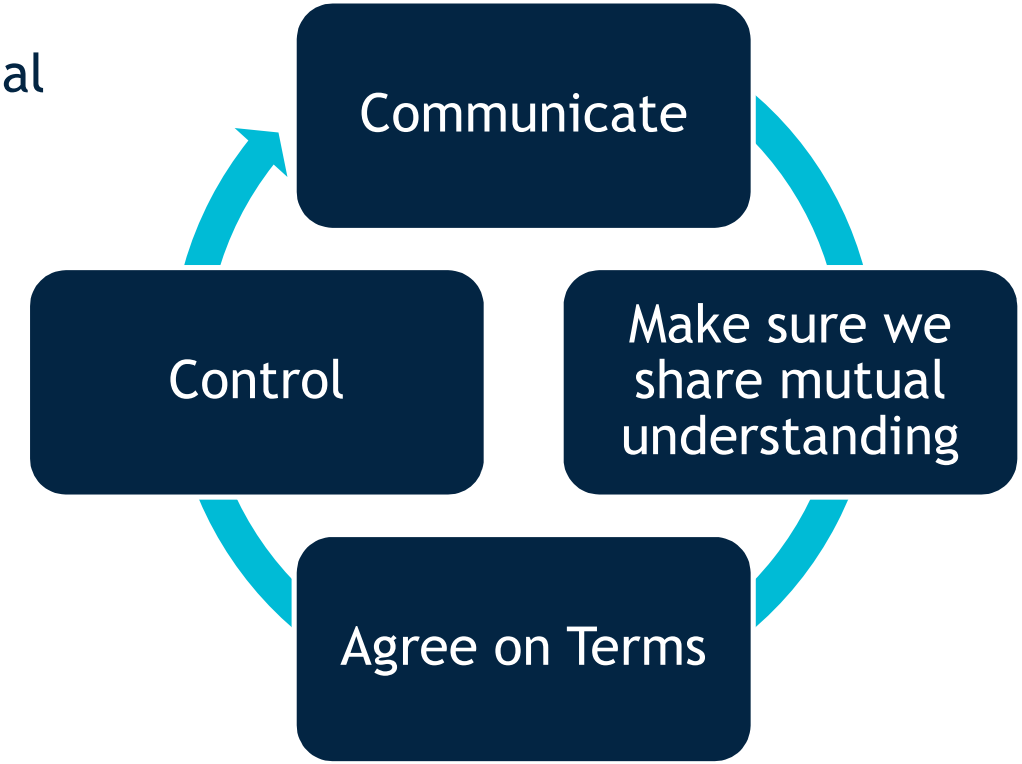
Social Responsibility is the integral Part of Business Operations



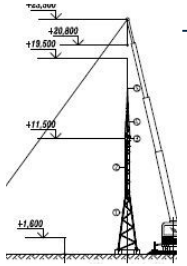
Dialogue With Contractors and Suppliers

- Investment and pprocurement plans regularly presented to local and international contractors and suppliers.

- Our Values:
  - transparency;
  - rationality;
  - efficiency;
  - do-operation;
  - professionalism.



Special Attention to Safety at Work



Compulsory work list

Compulsory registration journal

Metal fencing for the construction sites

Temporary fencing

Company‘s logo

Requirements for the place to have some rest

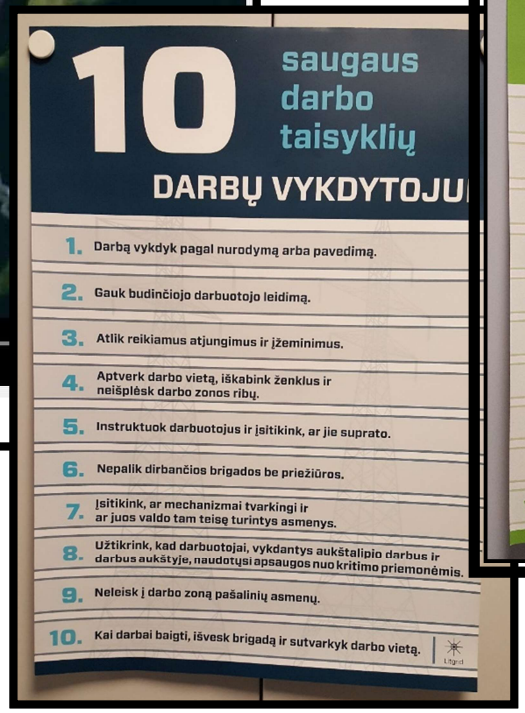
Litgrid

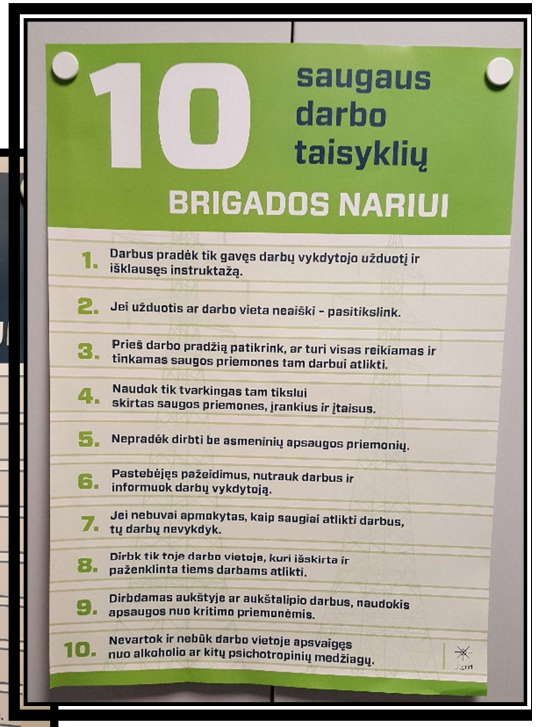
Unfortunately…

Educating Contractors

- Instructing before they start their work.
- Annual training for foremen.
- Regular visits to construction sites.
- Training maintenance staff.

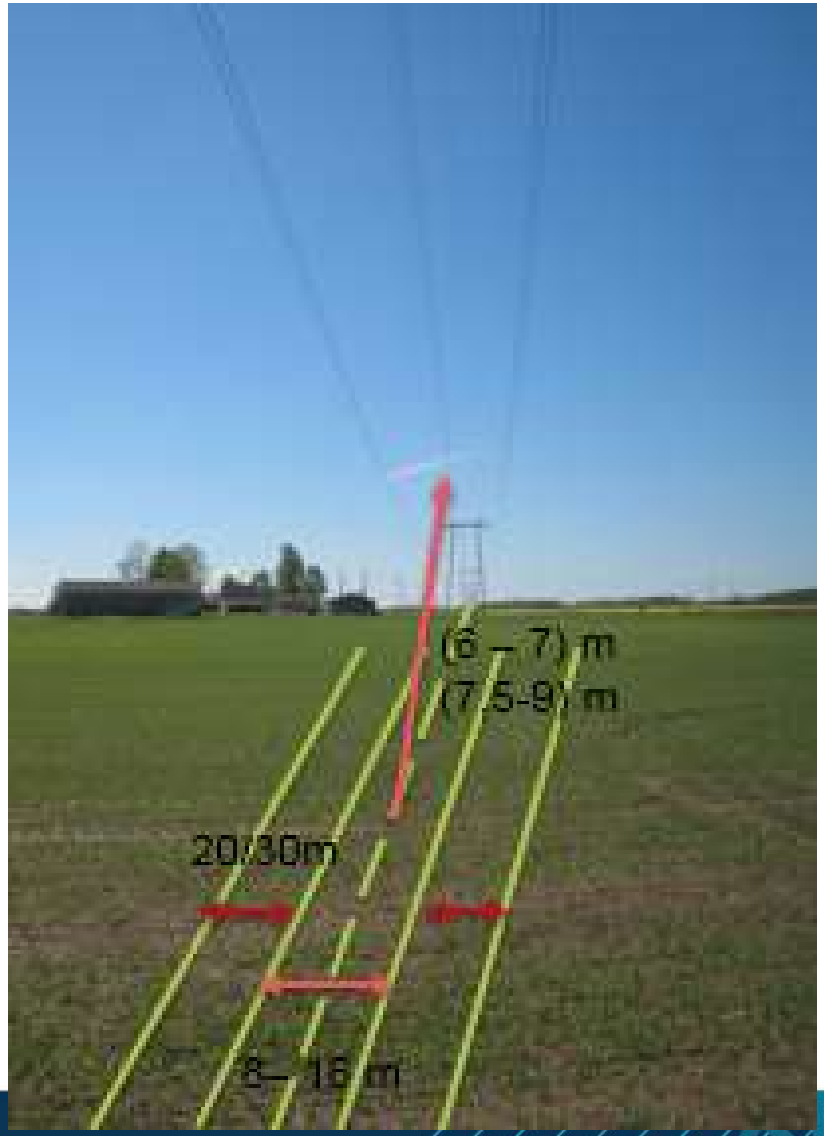
Special Attention to Safety Education



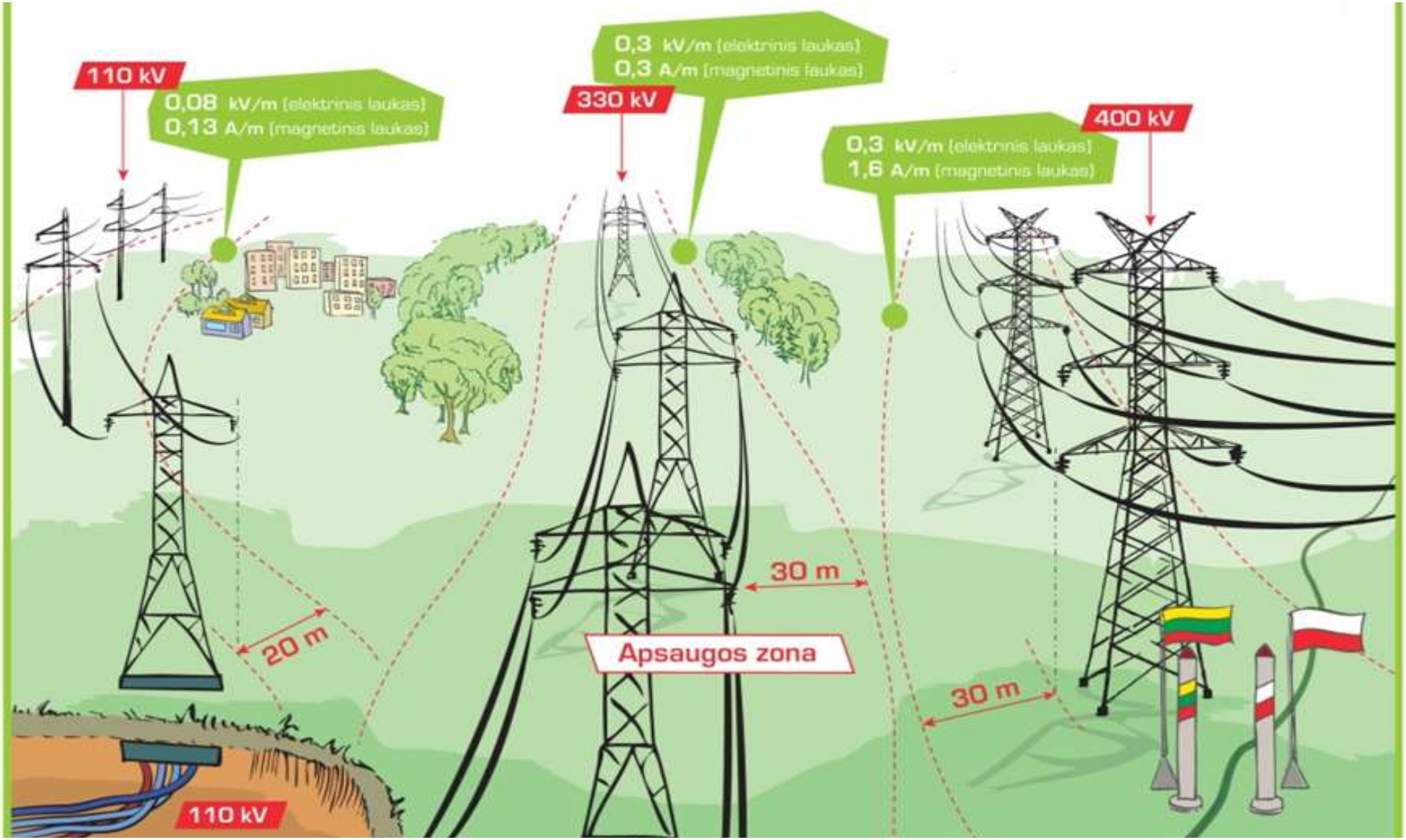


Educating the Society

- Protection zones are set to protect the lines from the accidents, and people – from possible contact with lines
- Protection zone is a strip of land along the line axis:
  - for 110 kV lines – 20 meters on both sides off the furthest wire of the line;
  - for 330 kV lines – 30 meters on both sides off the furthest wire of the line



Power line capacity predetermines the safety zone

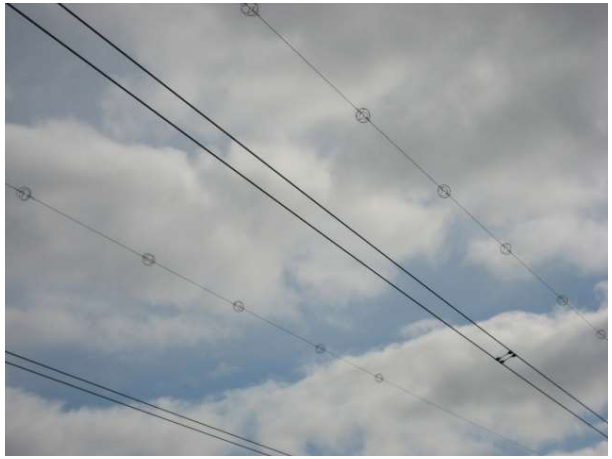


Safety First

Kaip Giedrius draugą pametė šalia aukštos įtampos elektros perdavimo linijos

Respecting the Environment

- Bird protection measures (co-financed by the European Commission and the Ministry of Environment) in cooperation with the Lithuanian Ornithological Society:
  - special bird-diverting devices on high-voltage lines:
    - **8500 pieces**
  - ‘forks’ preventing the birds from alighting over insulators:
    - **9000 pieces**
  - Special nesting-boxes for kestrels
    - **500 pieces**



Respecting the Neighbours

- In 2017 means protecting residential areas from noise were implemented. Barriers were constructed near capacity transformers at the Alytus back-to-back converter station that helped significantly reduce the level of noise emitted.

- Similar solutions are planned to be implemented at the Klaipėda transformer substation.

Traditional Tree Planting

More than 15 thousand trees planted in five years

Guests Are Most Welcome

- At the system Control Center in Vilnius.
- At the substation in Kaunas, Utena, Panevėžys, Šiauliai.
- gidai@litgrid.eu.

Dialogue with the Communities

- 40 meetings/discussions were held with well-known people in different cities and towns of Lithuania in 2017.

Energy for the Future of Lithuania