



Litgrid

Inspired by deeds and aims

2016 Litgrid annual
activities report
event

Daivis Virbickas, CEO



Litgrid at NASDAQ Baltic

■ UAB EPSO-G ■ Smulkieji akcininkai



5 520 shareholders

504 331 380 shares

€ 355,55 mln. market capitalization

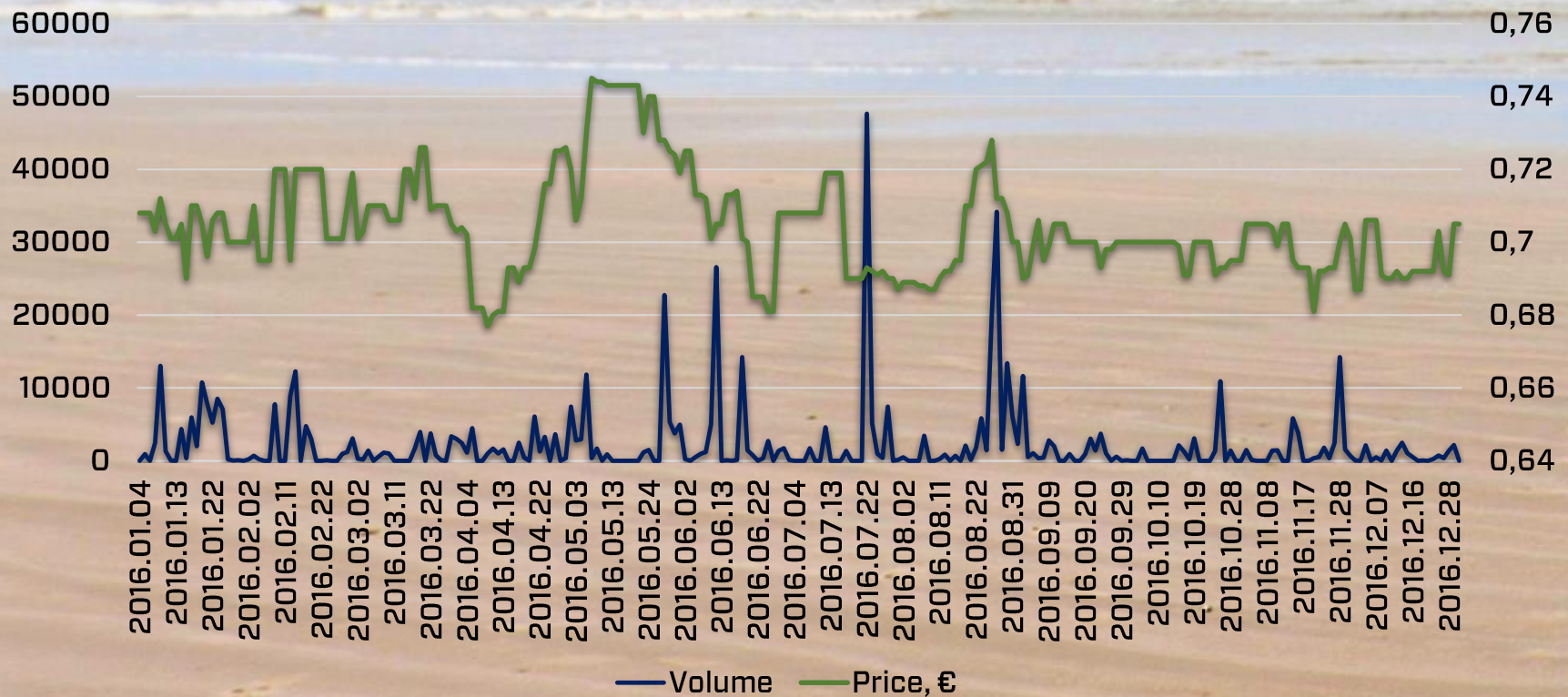
€ 18,16 mln. allocated for dividends

ROE = 7%

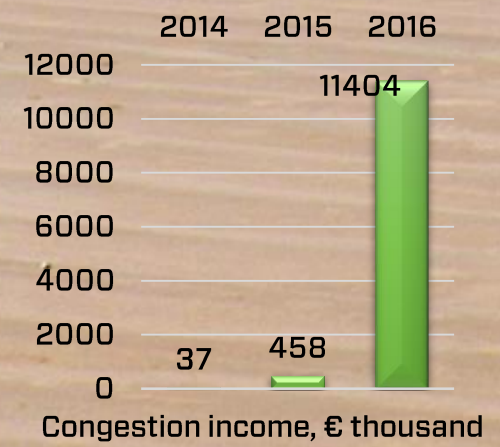
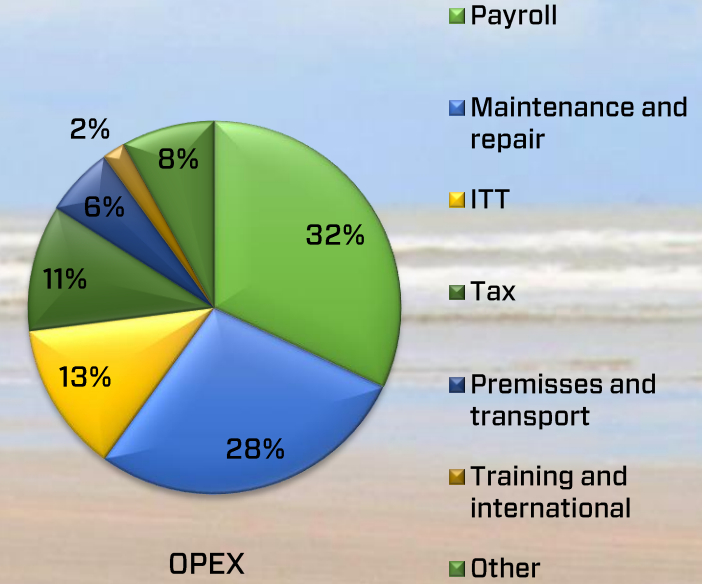
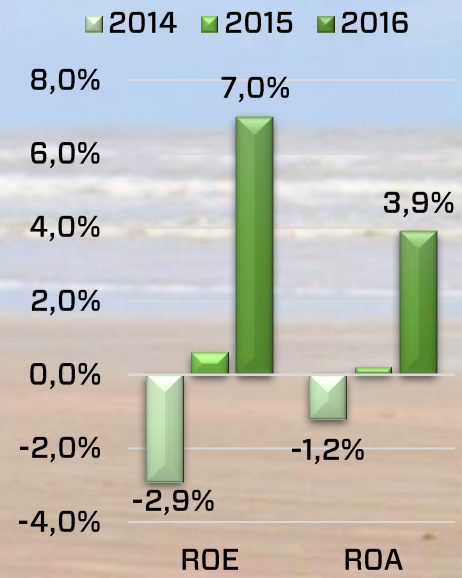
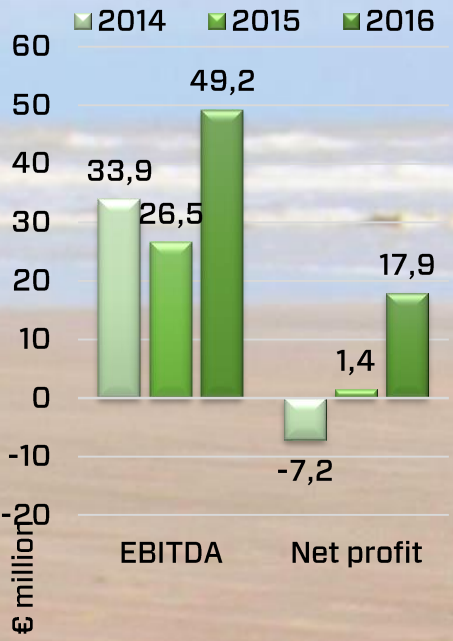
P/E = 21

(Data for 2016 12 31)

Price and volume of Litgrid share trade at Nasdaq Baltic

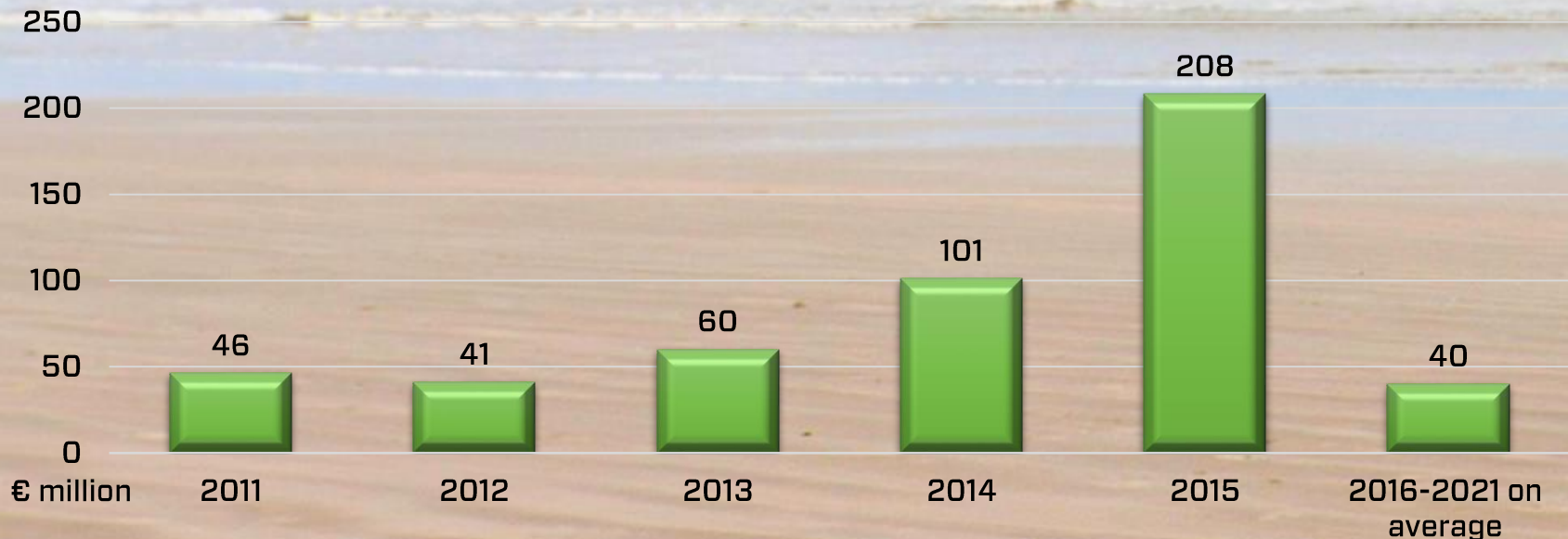


Financial indicators



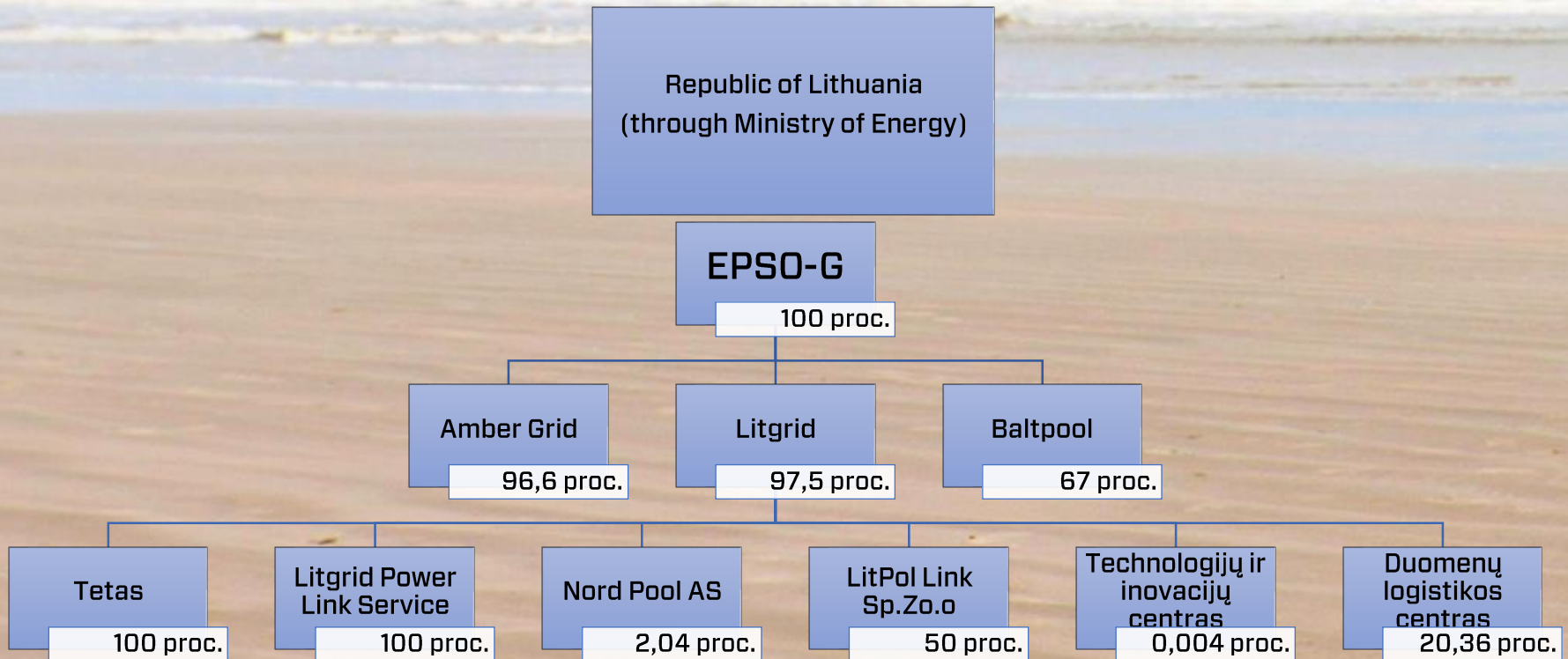
Net profit, ROE and ROA for 2014 shown in chart without respect to tangible fixed assets reevaluation

Investments – to foster business opportunities, security of supply and financial results



- Investments of 2014-2015 – to interconnections
- Investments of 2016-2021 – to grid enhancement and long-term security of the system

Litgrid is a part of EPSO-G group of companies



Board of Litgrid



**Rimvydas
Štilinis,
Chairman of the
board, EPSO-G**



**Nemunas
Biknius, EPSO-G**



**Domas
Sidoravičius,
independent
board member**



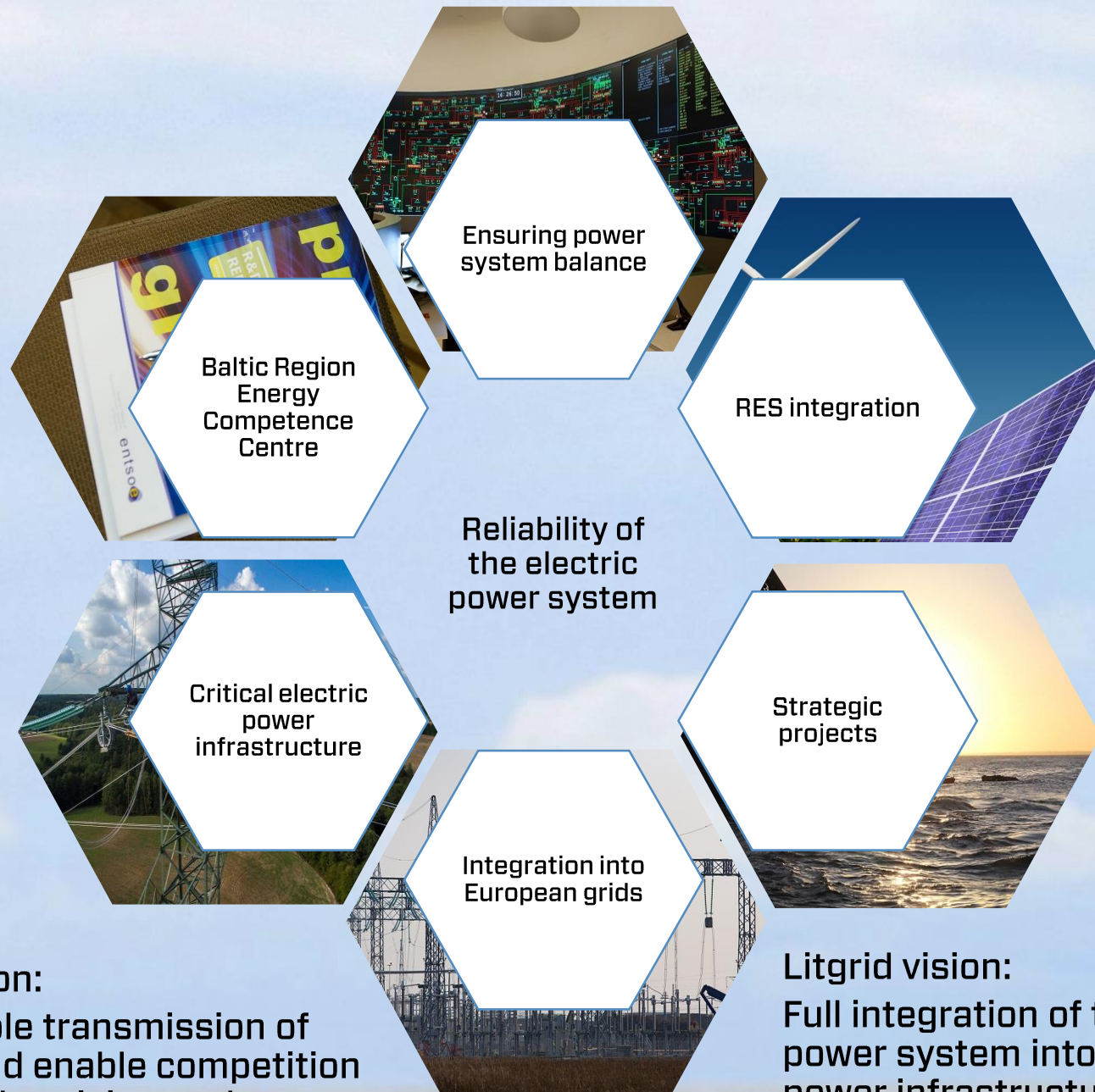
**Vidmantas
Grušas, Litgrid**



**DAVIS Virbickas,
Litgrid**



In Lithuania



Litgrid mission:
Ensure reliable transmission of electricity and enable competition in the open electricity market

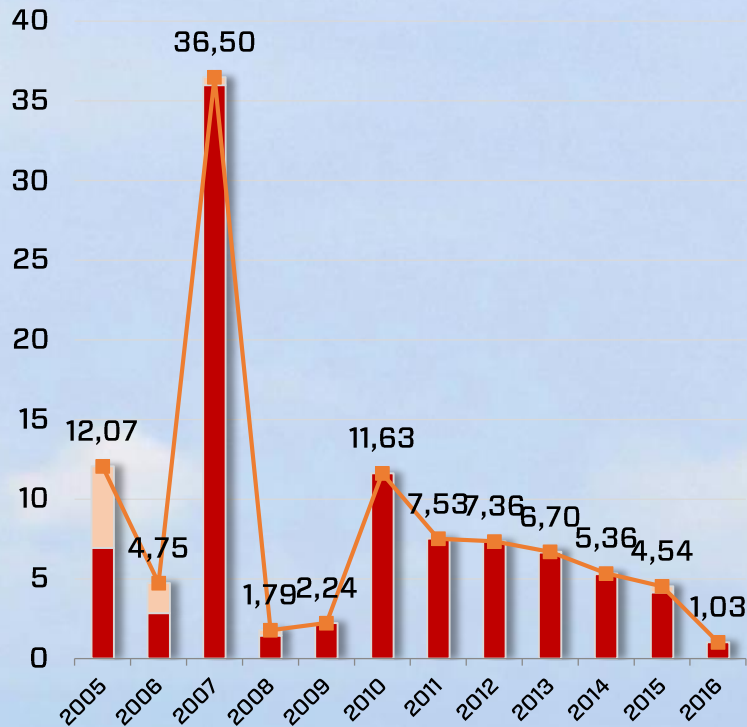
Litgrid vision:
Full integration of the Lithuanian power system into the European power infrastructure and the common electricity market



Litgrid – the key structure of electricity system, ensuring logistics of the power flows

In charge of the strategic national assets in power sector

END = 1,03 MWh
AIT = 0,04 min.



> 7 200 km of high voltage power lines

HVDC technology

Asynchronous interconnections with Sweden and Poland

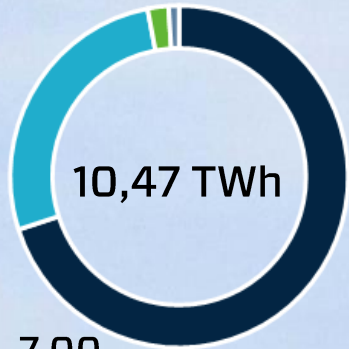
15 interconnections to 3 separate synchronous areas

Reliable and sufficient power grid

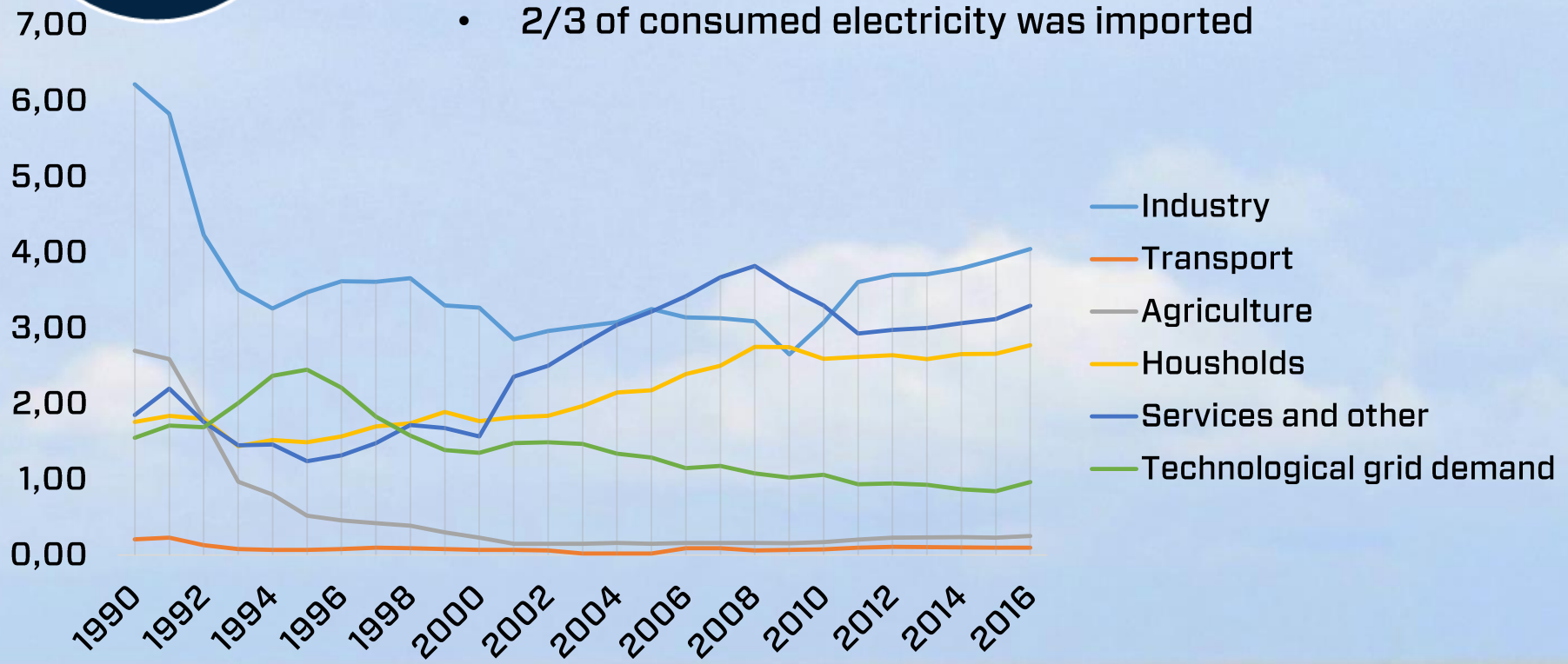
Power system operations 24/7

235 employees

Electricity demand grew by 4.5% in 2016

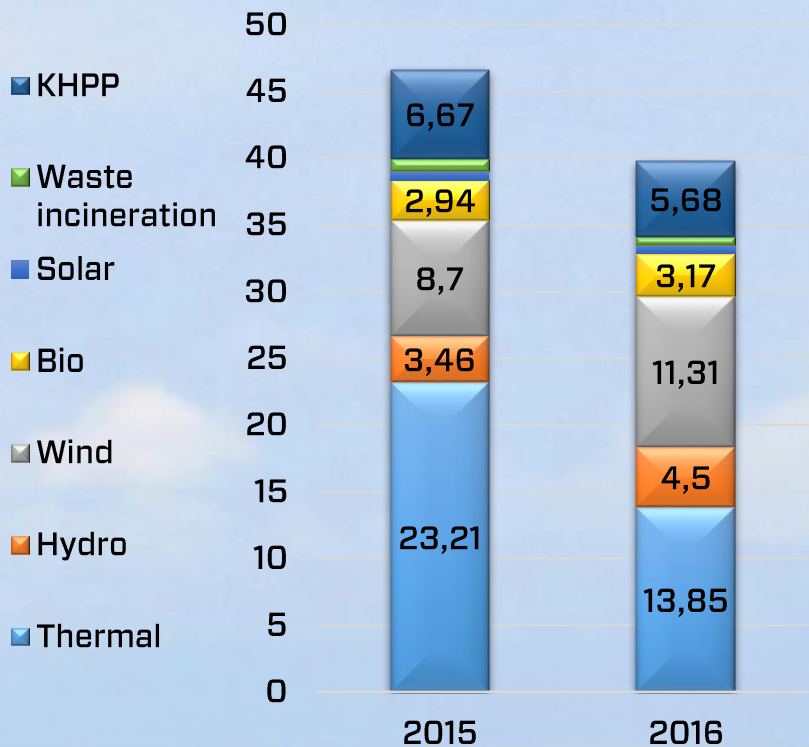


- Industrial consumption grew 3.5%, demand in agriculture - 8.4%, services sector - 5.7%
- Domestic users consumed 27% of the national demand, business and industry - 71%
- 2/3 of consumed electricity was imported



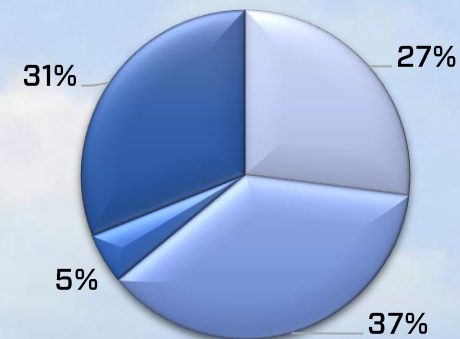
As local generation falls, import grows

19% of consumed (50% of locally generated) electricity was produced from RES in 2016



Electricity generation in Lithuania, GWh

Electricity import structure



- Sweden
- Latvia, Estonia, Finland
- Poland
- 3rd countries

First year of new interconnections' operation

LitPol Link

- Litgrid investment - € 108 mln.
- Operation since beg. 2016
- 500 MW capacity
- Availability to market - 96% of time

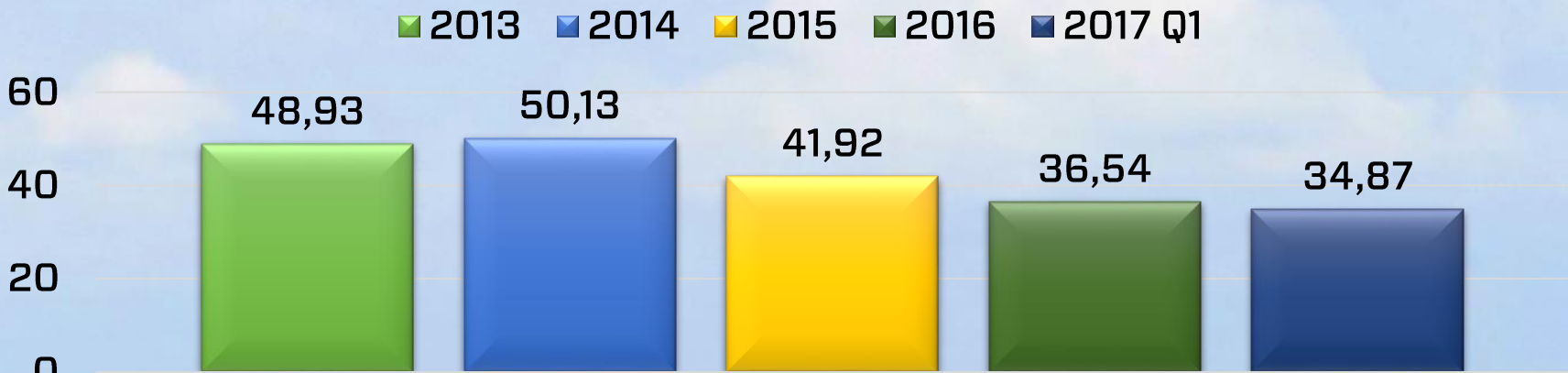
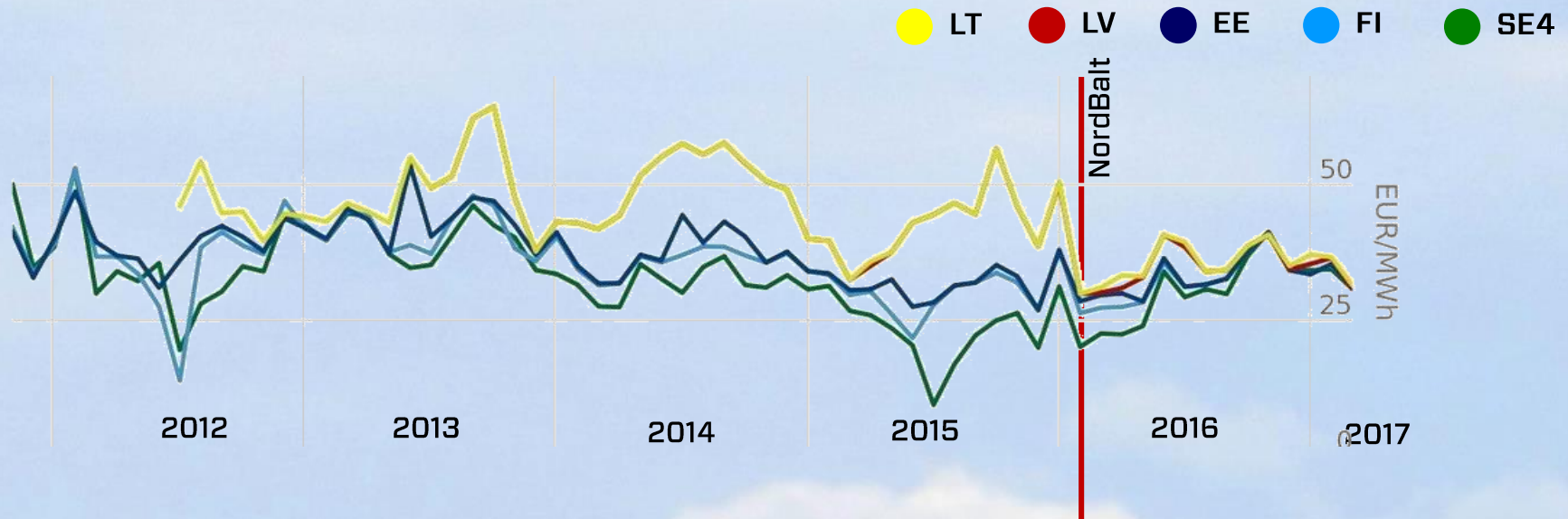


NordBalt

- Litgrid investment - € 222 mln.
- Operation since beg. 2016
- 700 MW capacity
- Availability to market- 78% of time



Impact to the regional market



Source: Nord Pool

Electricity market price €/MWh



The Eastern neighborhood

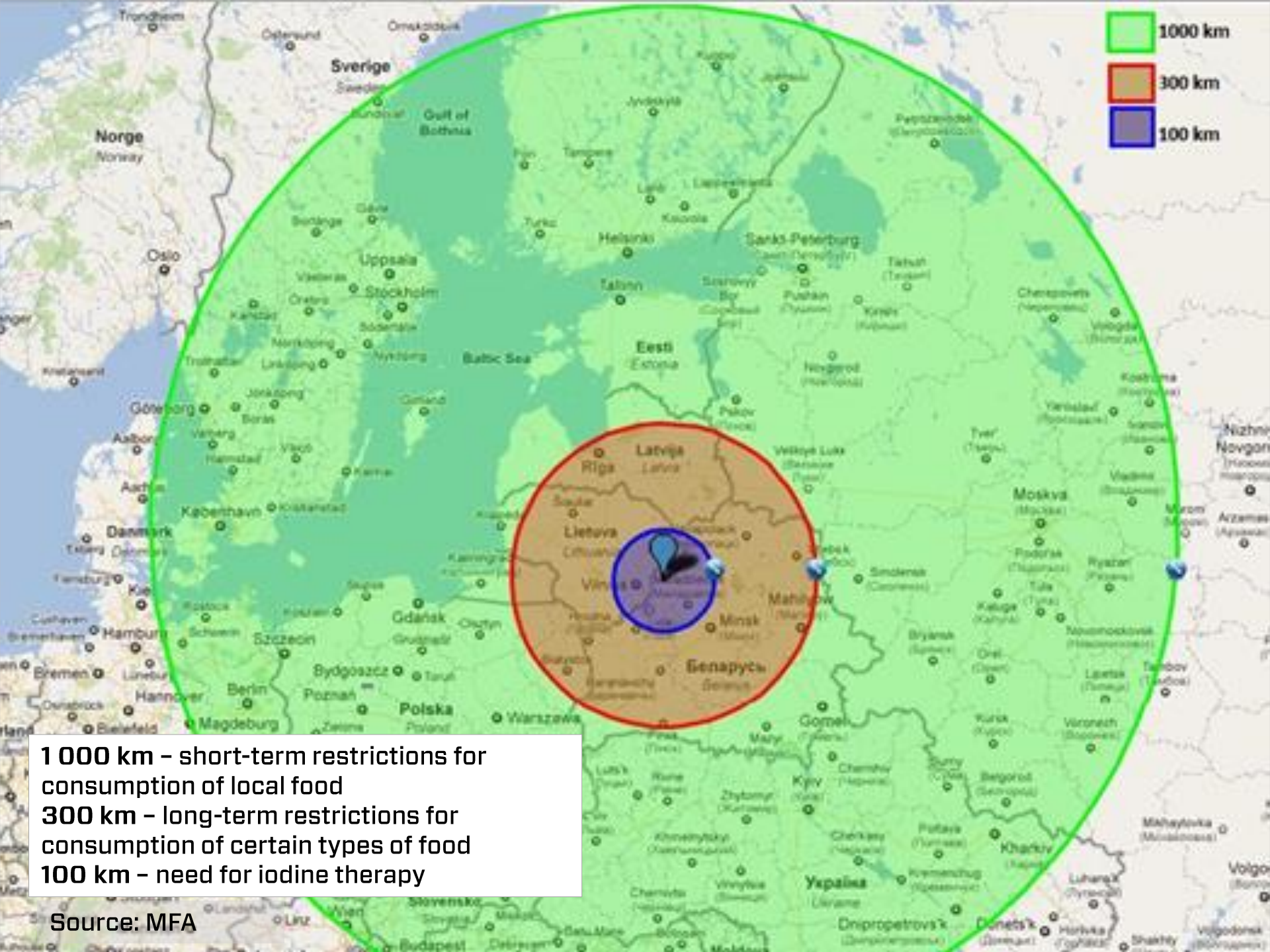
2 reactor block of 1 200 MW just 40 km off Vilnius

Planned start of operation - 2019 (2020)

100 km off Astravets NPP there are 919 thousands of Lithuania's residents



Sources: MFA; Ari Beser „A Preventable Nuclear Threat You Most Likely Don't Know About“, <http://voices.nationalgeographic.com/2017/02/23/a-preventable-nuclear-threat-you-most-likely-dont-know-about/>



Political or business agenda?

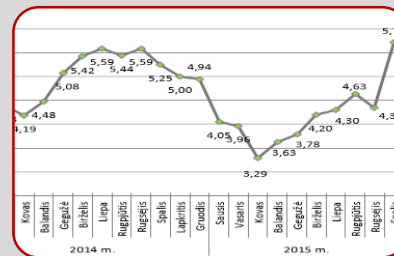


1 200 MW



1 200 MW

Nord Pool



36,54 Eur/MWh



~€ 700 million / year

- Efforts have to be aligned to prevent electricity from the unsafe construction to get access to Lithuanian/European power market
- What can be done?

How to stop electricity from Astravets NPP

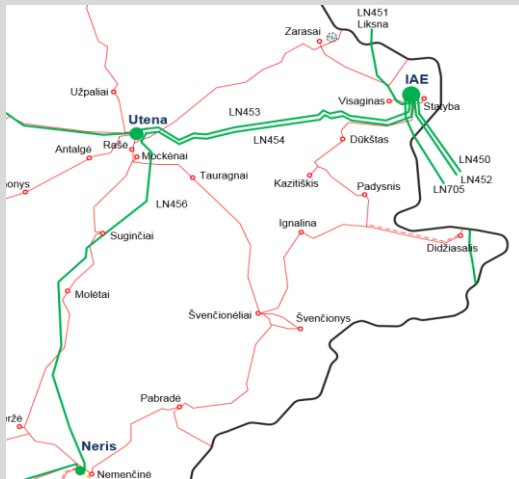
Quick
solution

**Electricity from 3rd countries not
traded at Nord Pool**

Long-term
solution

**Power system synchronization with
the Continental European Network**

Optimizing the grid in North-Eastern Lithuania



- Upon completion of the projects the Baltic power systems will be ready for isolated operation test and asynchronous operation with IPS/UPS
- Flexible operations of Lithuanian power system
- Up to 12 times lower operations cost

Project task

Technical project

Start of operations

2017 Q2

2017 Q2-Q4

2018 Q4

2019 Q1

2021

Public procurement

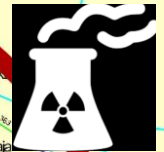
Start of reconstruction of Utena and Ignalina NPTS



The ring of former Soviet Unions' nuclear power plants



Leningradskaja AE



Kalininskaja AE



Ignalinas AE



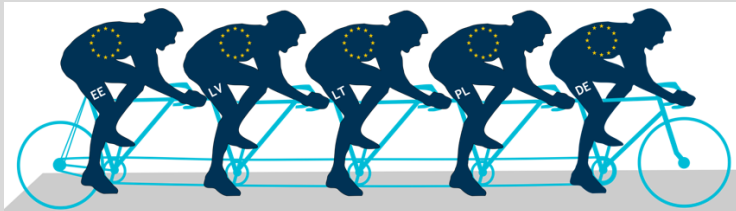
Astravo AE



Smolensko AE

Existing lines: 330kV 400kV 500kV 750kV	■ Nuclear power
Lines under construction/consideration: 330kV 400kV 500kV 750kV	■ Thermal power
— HVDC existing cable	■ Hydroelectric
— HVDC cable under construction/consideration	■ Pump-storage
	■ Substations
	● Substations
	⊛ AC/DC converter

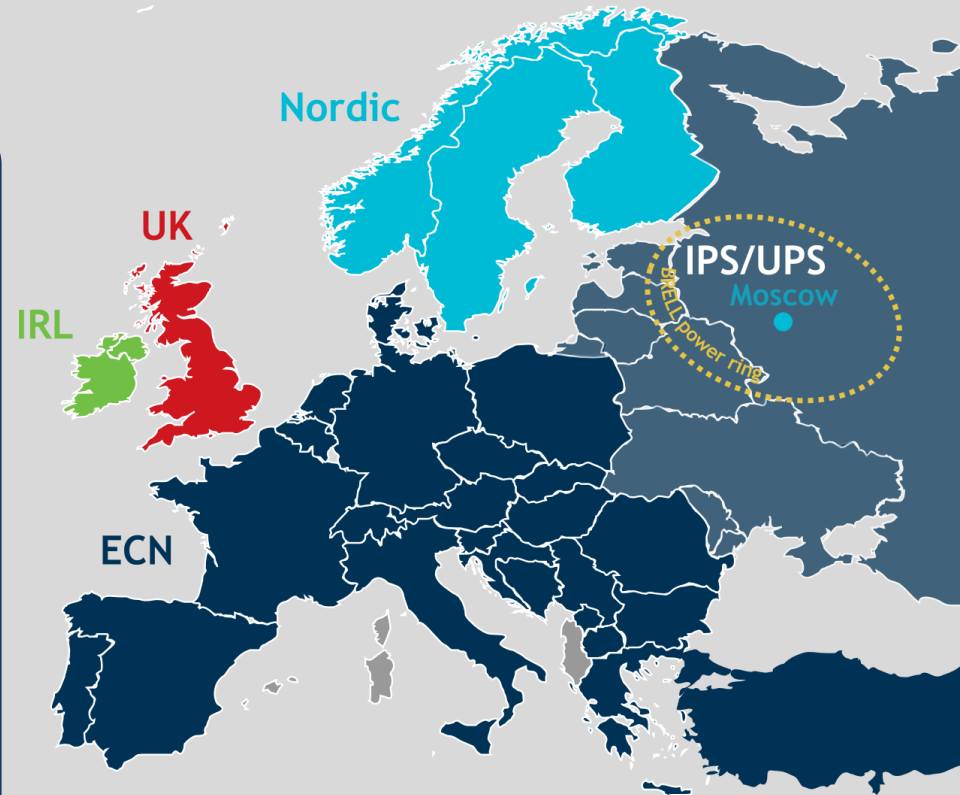
Ilgalaikis sprendimas - elektros sistemų sinchronizacija su kontinentine Europa



7 studies on Baltic power systems integration with the continental Europe since 1998 to 2017. Some decisions made:

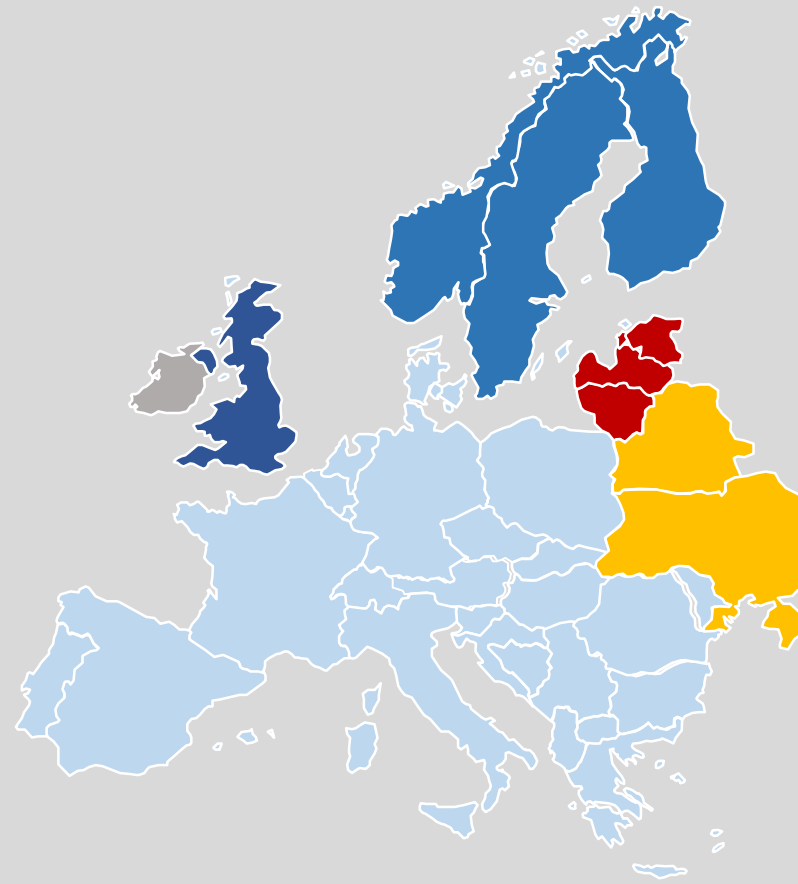
- New lines needed for integration will be built only in the territory of EU
- Synchronization – a Project of Common interest
- Final recommendations of EC JRC study expected shortly

Synchronous areas in Europe



Baltic power system operations in isolation to be tested 2018/2019

- Operations in the isolated mode – a must before synchronizing to continental European system
- After successful tests – in-depth analysis and decisions for preparedness

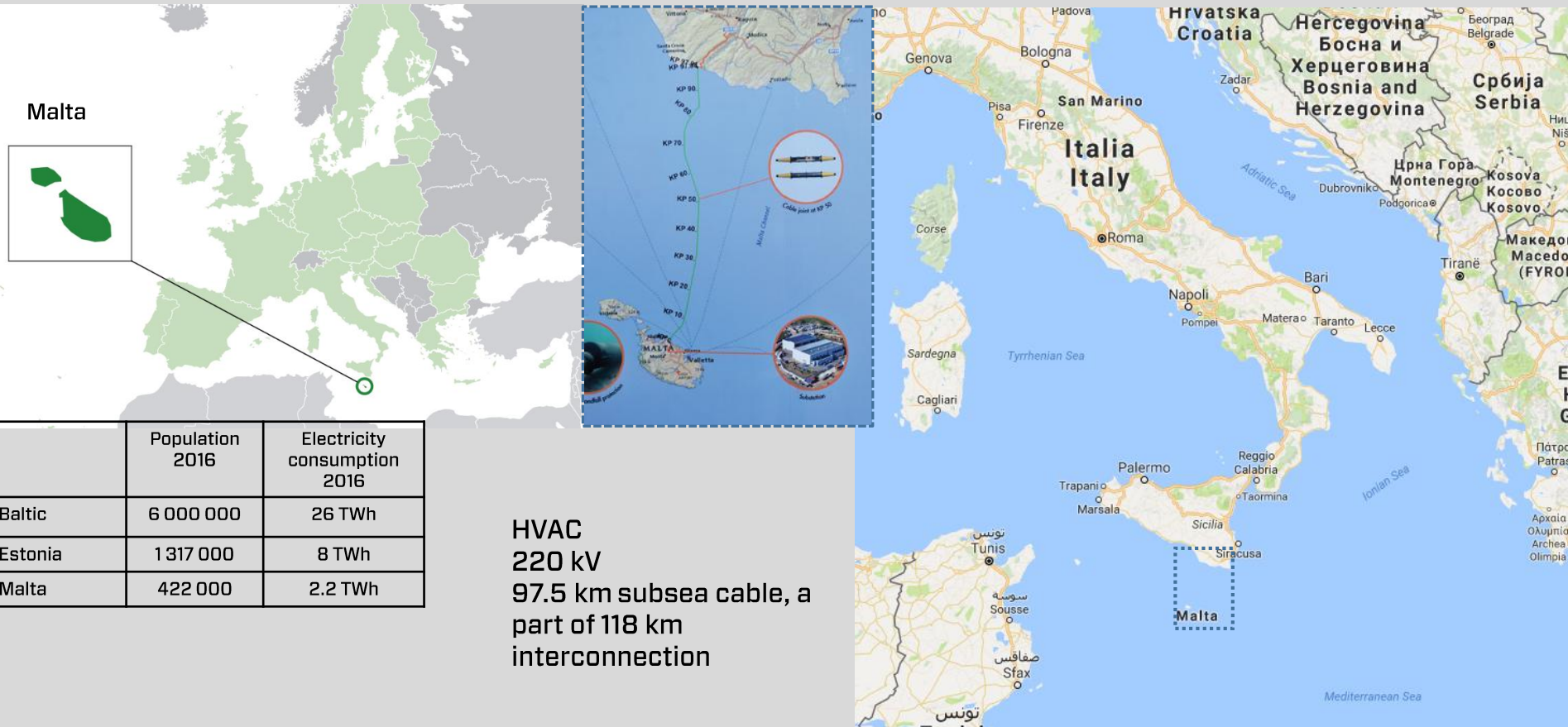


The LitPol Link interconnection may be sufficient for synchronization

- Thermal* capacity of the double-circuit interconnection Alytus-Elk is 2 x 1 200 MW
- 500 MW HVDC converter station could be switched to Alytus-Grodno line:
 - To ensure exchange of system services between Kaliningrad and mainland Russia
- LitPol Link 2 remains in the plans, possibly – after synchronization

A comment on the scenario of Northern synchronization

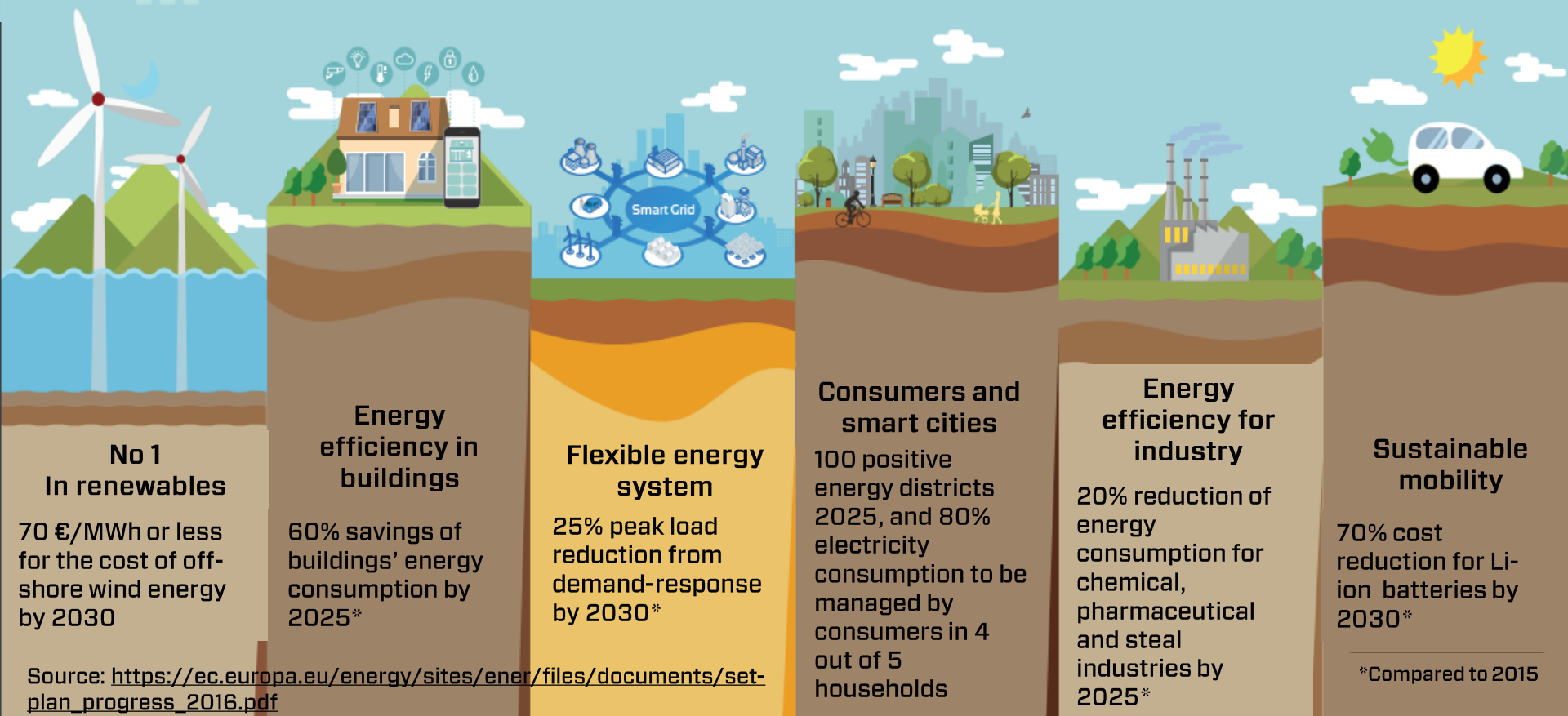
225 MW HVAC cable interconnection Malta-Italy





European outlook

Lean energy for all Europeans package: accelerating innovation for low-carbon energy technologies



General market organization

- Market-based pricing
- Common power market design to ensure the adequacy of the EU's power system
- National capacity markets will not be allowed to disrupt European market design
- Enhanced interconnectivity and cross-border participation
- Better integration of RES



New roles of consumers

- Consumers will, amongst others, be entitled to:
 - Enter into dynamic pricing contracts reflecting spot prices and restricting termination fees
 - enter into agreements with demand response providers and aggregators (without the supplier's consent)
 - access and use free of charge comparison tools and smart metering systems
 - rely on detailed billing guidelines and information
- Highly flexible demand-side management for companies and private households



New roles for distribution system operators (DSO)

- Development of 5- to 10-year network development plan
- Development of system services market for:
 - Distributed generation
 - Demand-side response
 - Storage
 - Energy efficiency measures
 - Limitation to own and develop charging and storage solutions
- Unbundled DSOs must create an “EDSO-E”



More engagement among transmission system operators

- Cooperation throughout Regional Operational Centers
- Ensure effective participation of all market participants
- Limitations to own and develop storage facilities and assets providing ancillary services
- Cooperation for risk-preparedness in the electricity sector



Additional powers to regulators

- Extension of their tasks and competences with respect:
 - to regional co-operation on cross-border issues
 - establishment and functioning of Regional Cooperation Centers
- Additional powers to issue (joint) binding decisions on electricity undertakings, carry out investigations and give instructions for dispute settlement, request information and impose penalties



Clean energy for all package will impact all

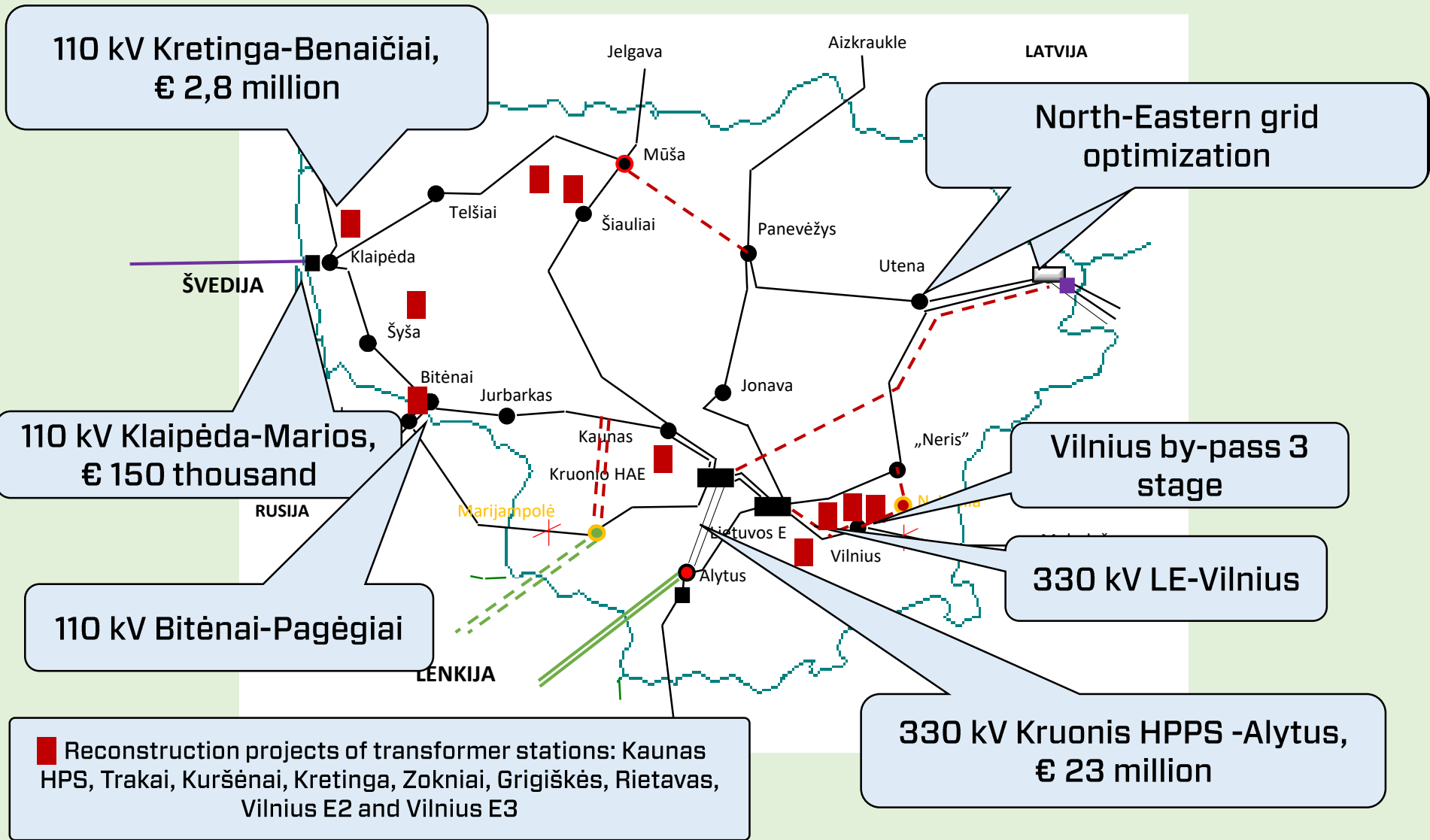
- *Energy-only* market is enhanced
- More powers to consumers
- DSO will have to participate in market development
- Competition-based market participation
- RES are no longer exceptional, rather *new traditional* source of energy



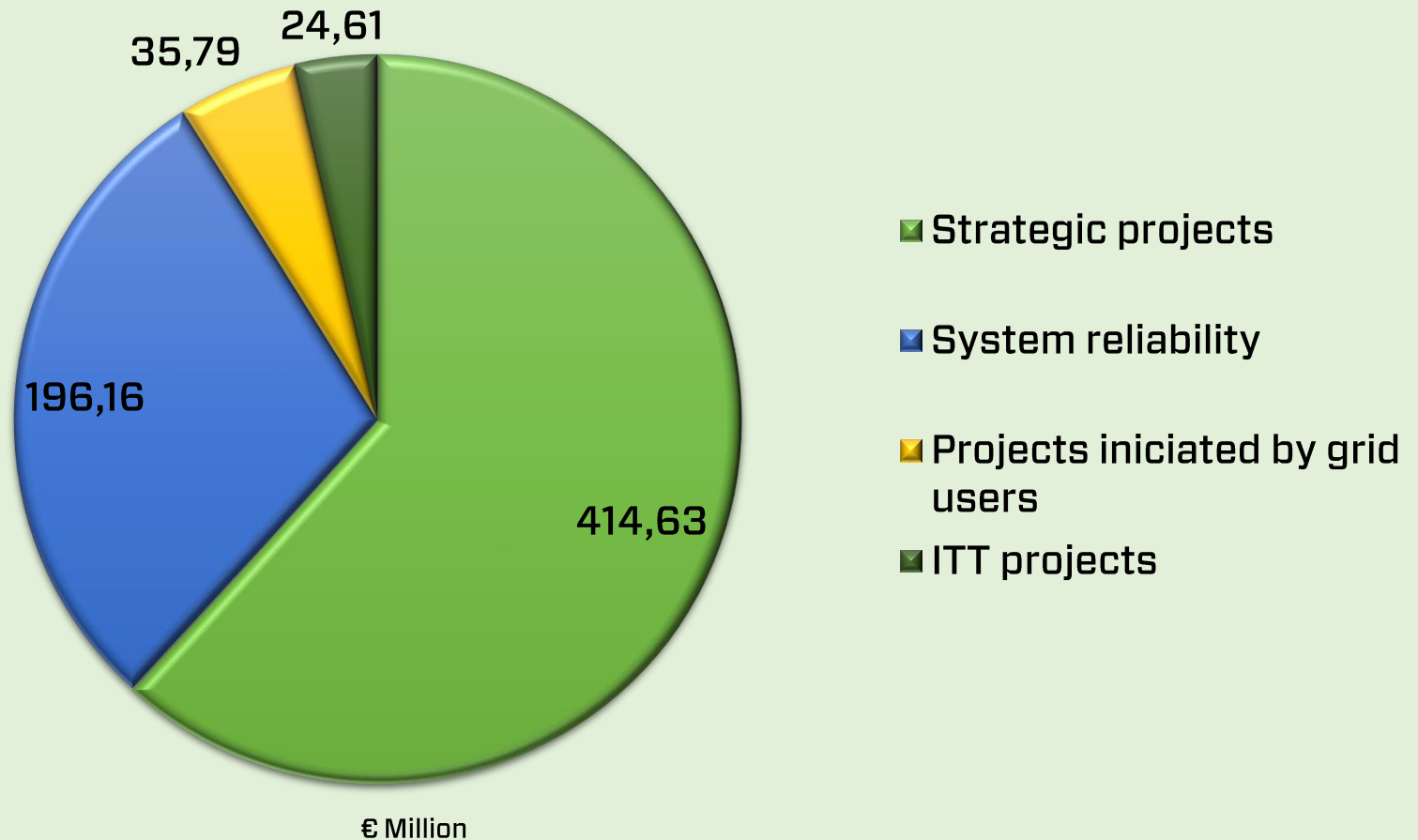
Grid maintenance and development projects



Enhancing transmission grid



Investment to grid projects 2016-2025 - > € 671 million



Socially responsible planning and implementation

A large group of people, including children and adults, are seated in a room, likely attending a community meeting or public consultation. The room has a wooden floor and a white wall with a door in the background. The people are looking towards the front of the room, suggesting they are listening to a speaker or participating in a discussion.

Better living environment:
additional sound isolation
by the substations in
Alytus and Klaipėda distr.

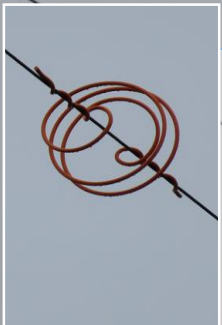
Informing residents about
grid maintenance and
development projects in
advance

Developing relationship
based on dialogue and
mutual respect

Taking care of those smaller and weaker

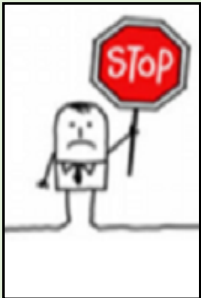


Monitoring of wildlife near newly built lines LitPol Link and Klaipėda-Telšiai



> 17 thousand bird diverters installed on the lines

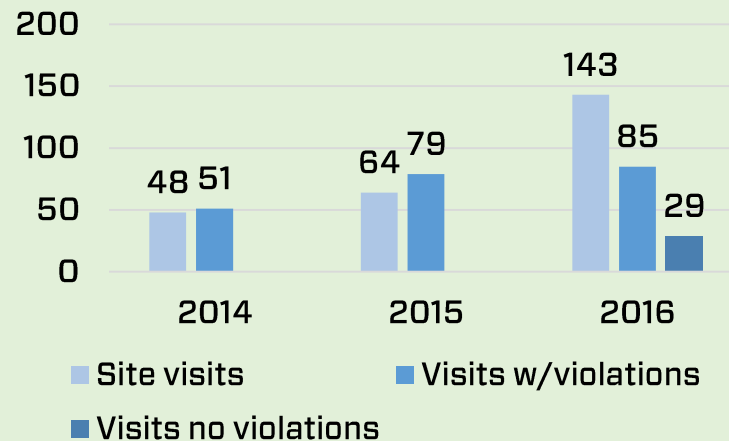
Special attention to quality of contractors' work



Regular site visits, requirements and control

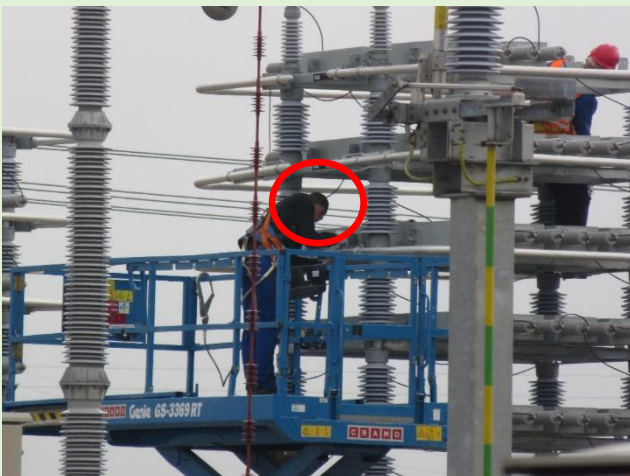


Safety at work – first of all



Why safety at work is our topic?

- Safety at work must become a business priority
- 99% of accidents can be prevented
- Prevention is cheaper than consequences of accidents

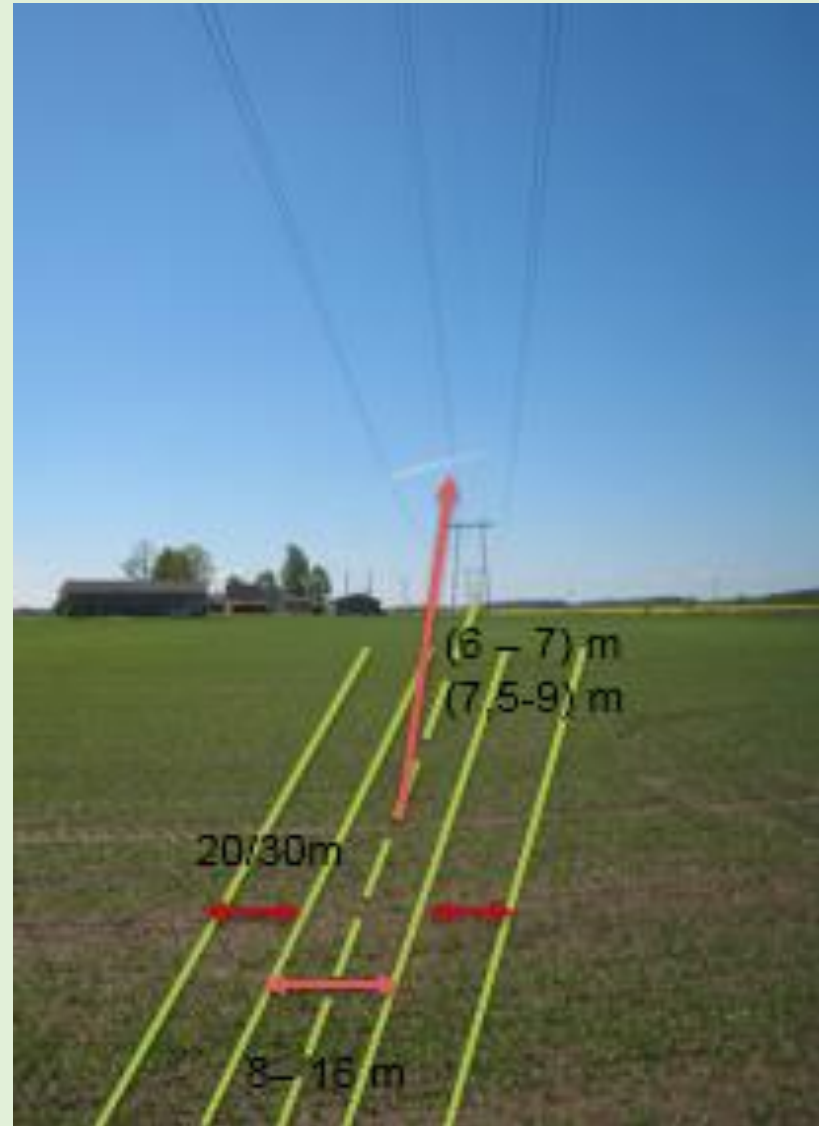




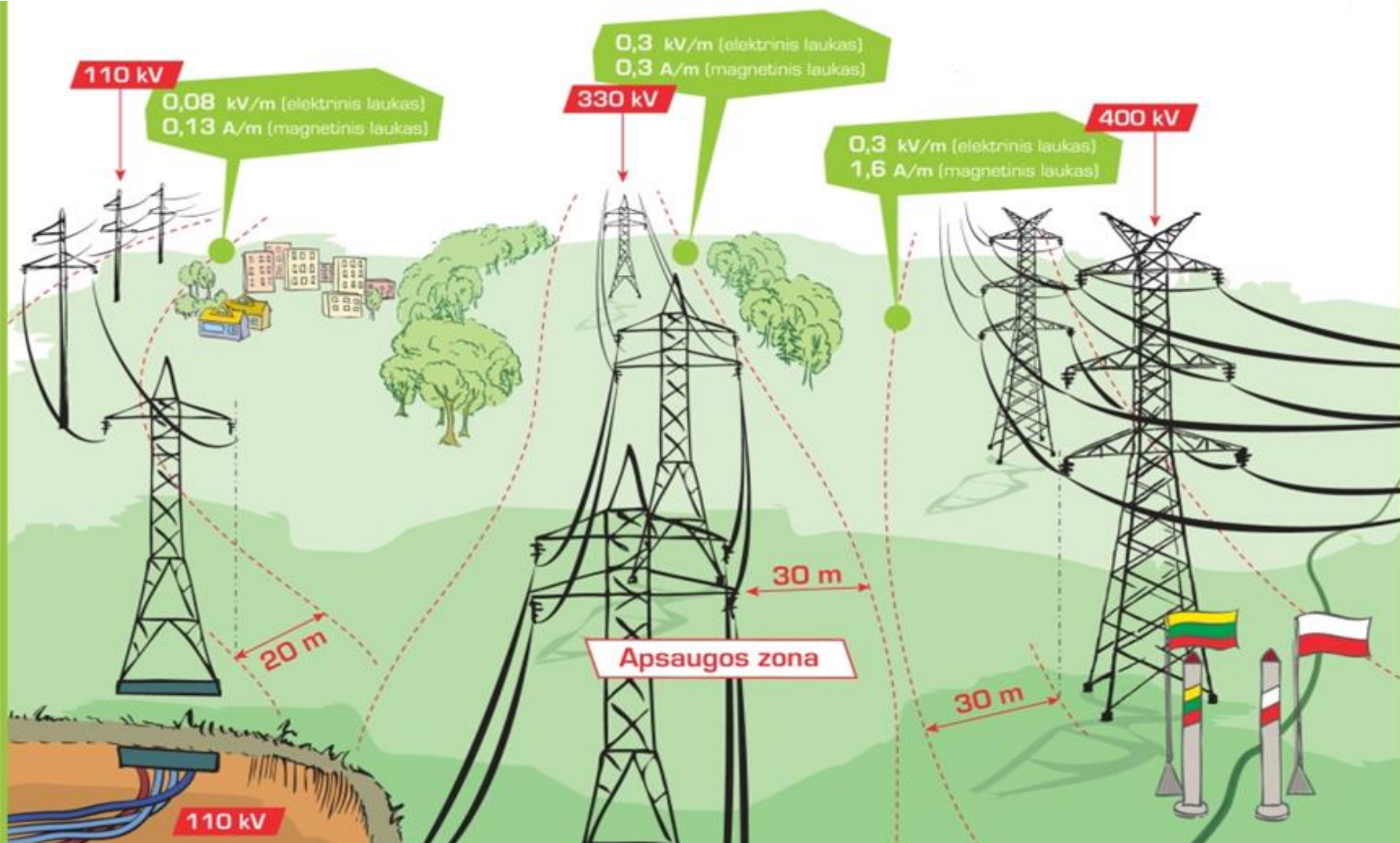
FAQ

Protection zones of the power lines

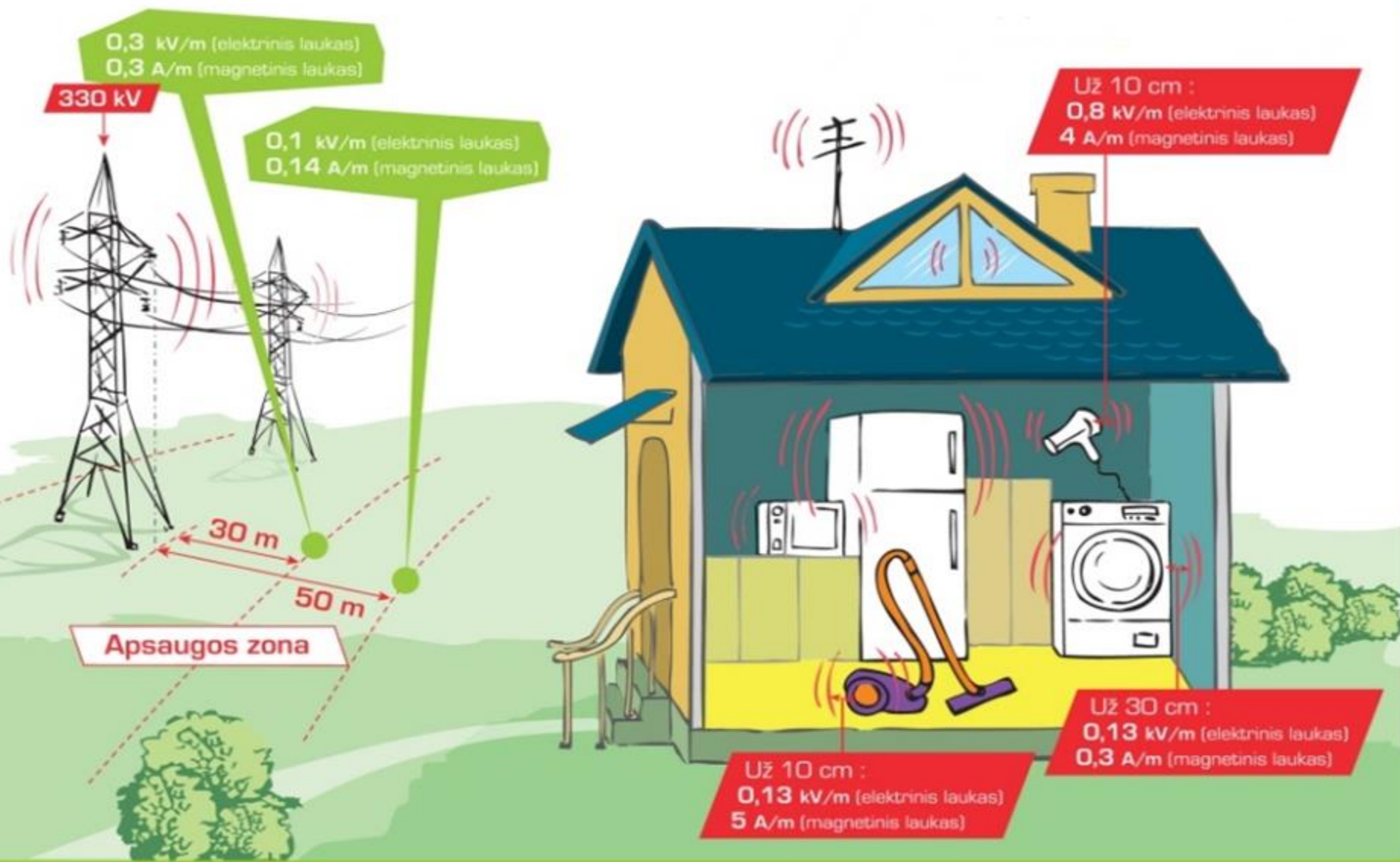
- Protection zones are set to protect the lines from accidents, and the people – from possible contact with the lines
- Protection zone is a strip of land along the line axis:
 - for 110 kV lines – 20 meters on both sides off the furthest wire of the line
 - for 330 kV lines – 30 meters on both sides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

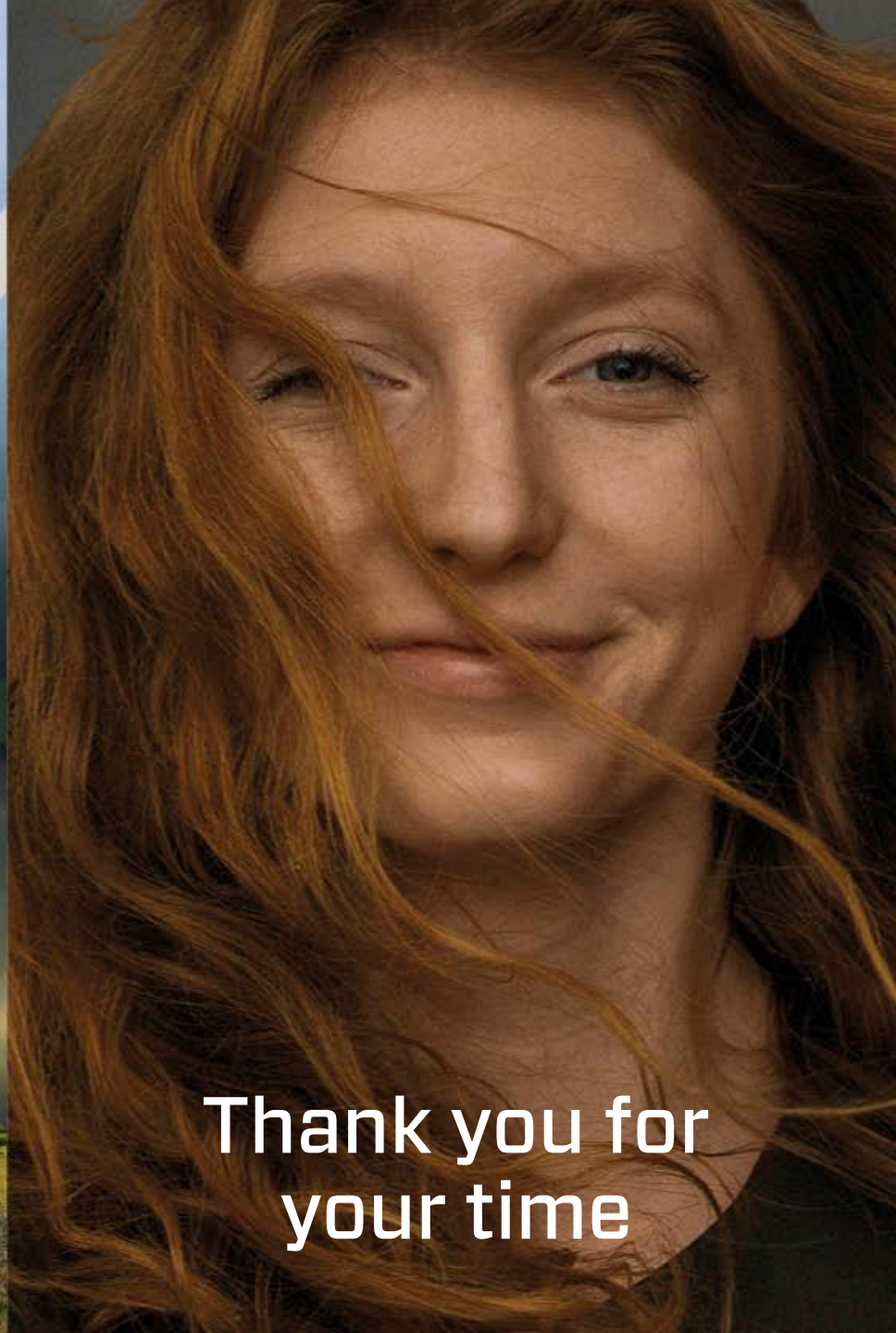


Power line capacity predetermines the safety zone



Magnetic field is a part of natural surroundings





Thank you for
your time