

ENERGY SECURITY FROM DEVELOPER'S POINT OF VIEW

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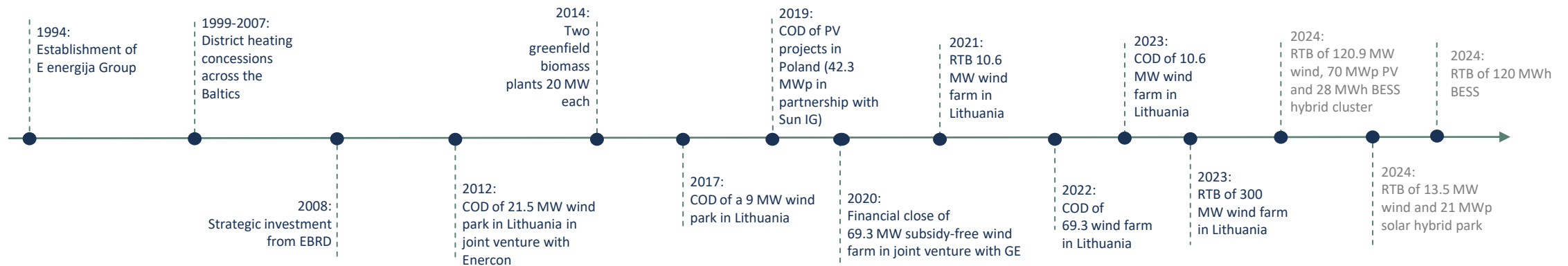
CEO of E energija

and Chairman of Lithuanian Wind Energy Association



E ENERGIJA GROUP

- Founded in 1994 as a pioneer within the modernization of heat generation through district heating networks
- Developed and or built 1000+MW of thermal generation assets and 500+MW of renewable electricity projects
- Has built a successful track record of partnerships with global renewable energy companies, such as EBRD, GE Capital and Enercon.
- Over the past 10 years E energija Group has become **a leading developer of wind, solar and hybrid renewable energy projects in Lithuania**



ENERGY SECURITY: TWO DILEMMAS

Diversified RE generation will make us more secure

- More **geographically diversified** plants are less susceptible to physical security risks
- Combination of **diversified renewable technologies** reduces risk of potential supply disruptions:
 - LNG terminal breakdown/sabotage
 - Physical attack on a large generation plant
 - Cyber attack on a single large generator
- **Combination** of wind, solar, hydro, biomass, biogas, WtE, pump-storage, BESS and interconnectors **is the most secure long-term solution.**

Each new RE plant is an additional threat to security

- The **smaller** each plant gets, **less attention** of security risks can be given
- Each new plant brings a potentially new and unknown control system, software and hardware
- Chinese components and control systems are trending in PV, BESS and even wind energy installations
- **Centralized „security measures“** tend to be **less effective in a diversified system**
- A traditional generator (e.g. LNG power plant or even nuclear power plant) secures stable generation

What if all „small“ plants suddenly stop operating?

ASSESSMENT OF REAL SECURITY ISSUES BY TECHNOLOGY

WIND

- No real issues with security at the moment
- All OEMs are from NATO members and use their proprietary control systems
- Current legislation proposal would omit the option of cost competitive Chinese OEMs in Lithuania
- Chinese OEMs signing projects in Germany and Italy – what about security threats there?

PV

- Major issues with retrofit of existing plants
- Does the interim firewall solve the issue or create a bigger risk of the whole portfolio?
- Non-Chinese alternatives of inverters are more expensive and less advanced
- Prohibiting remote access to Chinese inverters potentially reduces availability and creates issues with warranty events

BESS

- No real cost effective alternative for Chinese battery cells with their BMS
- Possibility of prohibiting remote access to BMS
- Two options of converters
 - Chinese with access limitations?
 - Non-Chinese with full functionality
- All grid controls should be non-Chinese

OPEN QUESTIONS



What is the minimum size of each plant that can affect the system?

What is the size of the portfolio needed to have an impact on the system?

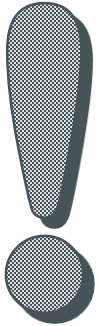
What if the „large traditional generator“ is compromised?

Does the „intermediary local operator of control systems“ create more security or add another layer of potential vulnerability?

What is the cost of retrofits needed for existing operators?

Do we actually know what we are doing?

DEVELOPER'S POINT OF VIEW



The development of renewable projects take up to 5 years until COD

Changing security requirements result in project delays and additional costs

Retrofit requirements may not be met – shall we disconnect those plants?

Some projects based on Chinese technology become uncompetitive – who takes the cost increase?

We cannot be more strict or expensive than our neighbors connected to the same system

The requirements on the energy security should not stop the development of new renewable energy and BESS projects which are the essence of our independence

3 PIECES OF ADVICE TO THE POLICY MAKERS

Avoid changes of requirements for projects in late stages of development

Any retrofit requirements should be compensated to the developers

Apply EU wide standard approach and ask for clear implementable measures