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CE4EUIslands – Workshop 5: The Last Mile

main services for DSOs traditionally offered by TPPs

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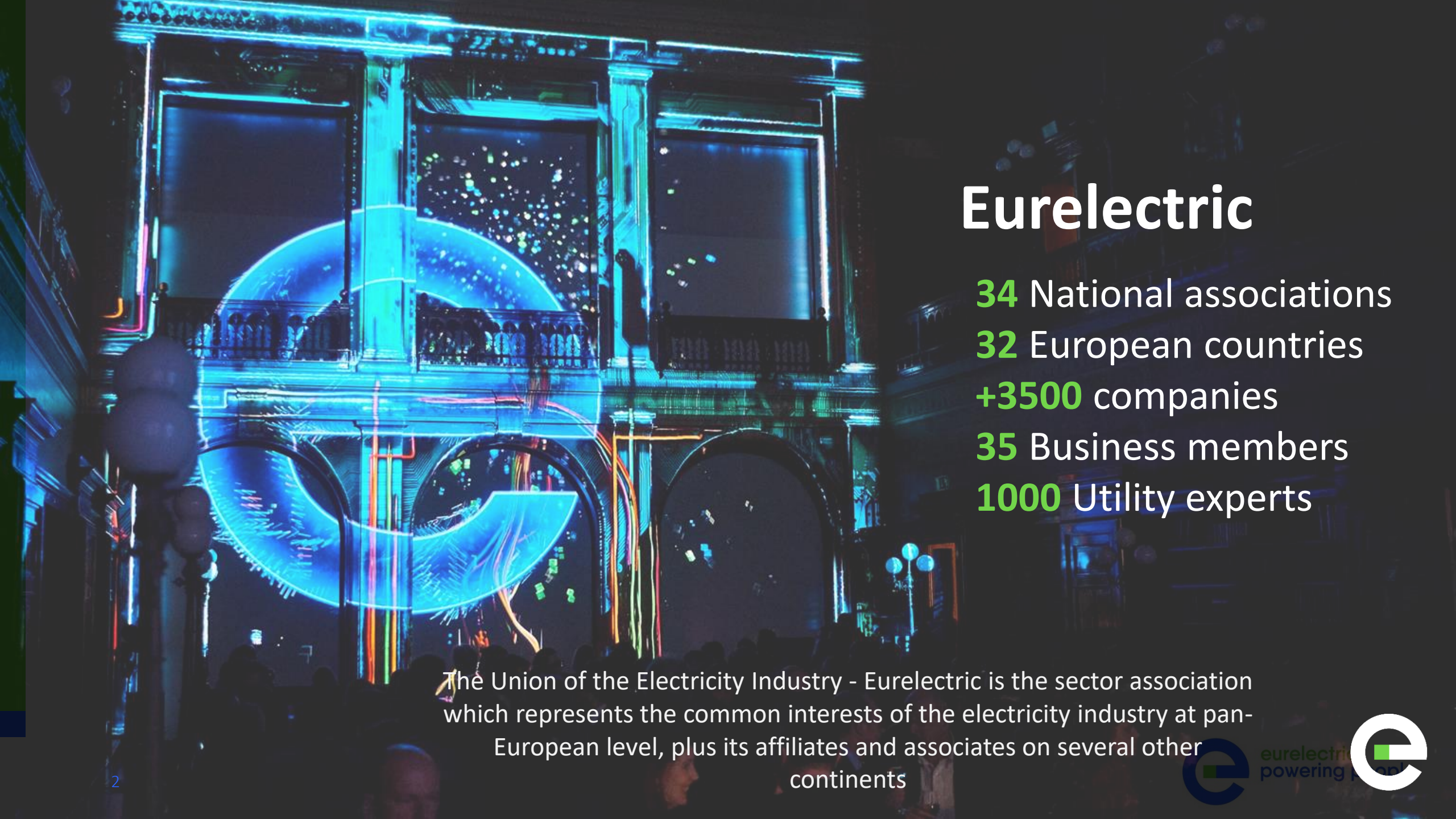


Eurelectric

34 National associations
32 European countries
+3500 companies
35 Business members
1000 Utility experts

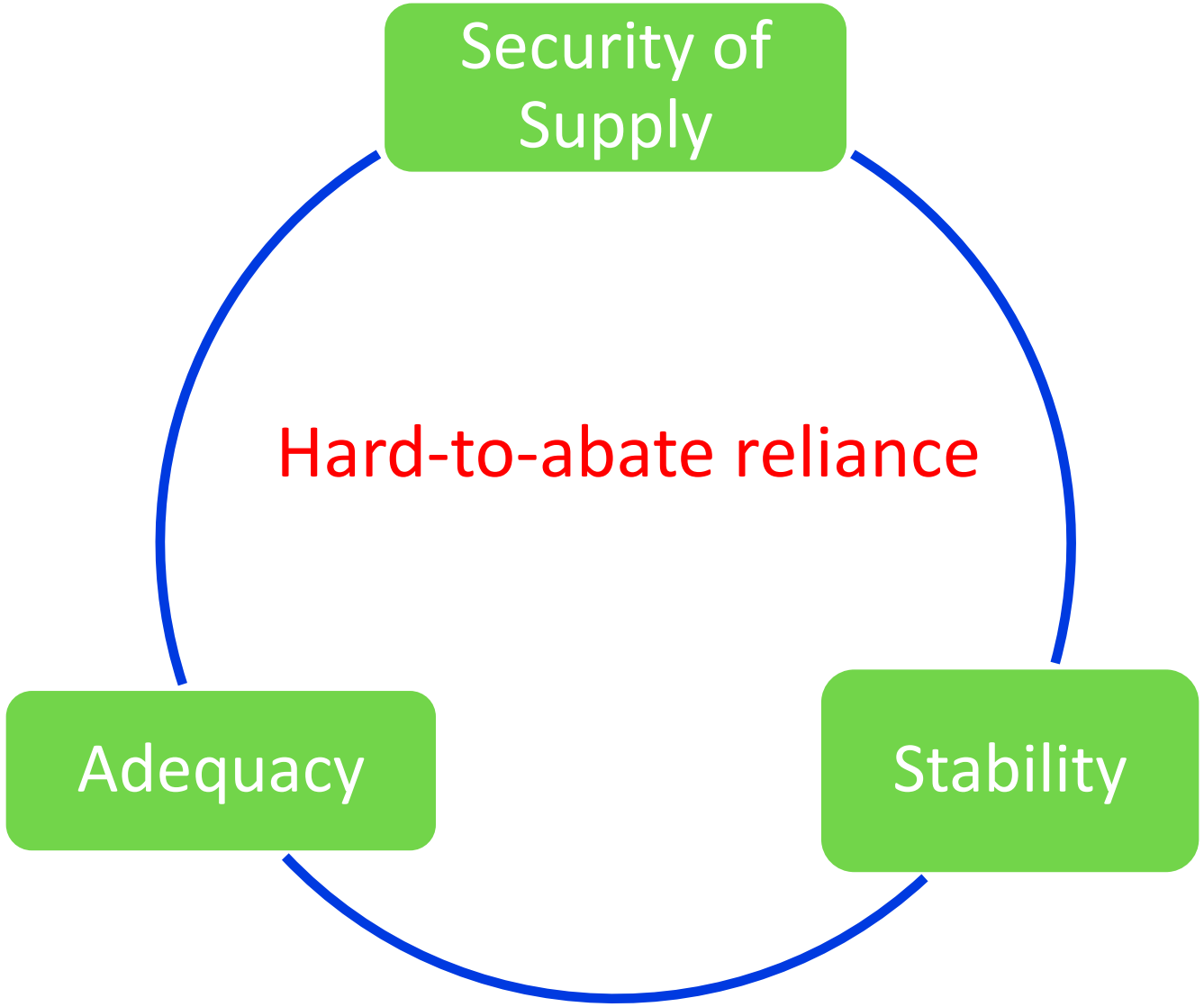
The Union of the Electricity Industry - Eurelectric is the sector association which represents the common interests of the electricity industry at pan-European level, plus its affiliates and associates on several other continents

Three areas of focus

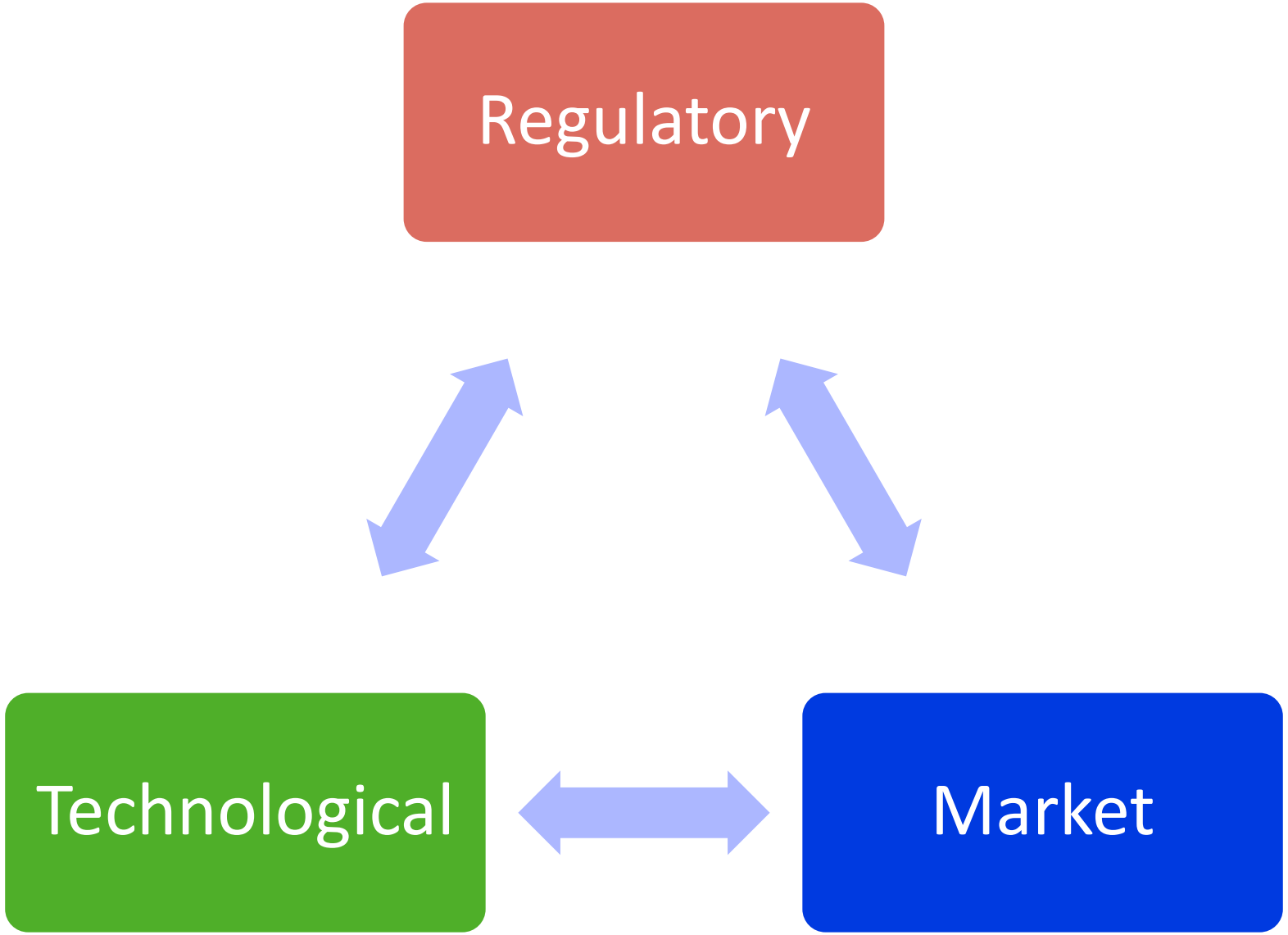
1. Why TPPs matter in non interconnected islands? → The essential services they provide
2. Why there's a heavy reliance on TPP in these islands? → A mix of causes: regulatory, market and technological issues
3. Where to from here? → Our policy recommendation to increase the penetration of wind and solar while ensuring security of supply: A grids stability toolbox

Finally, we'll also go through some best practices in Faroe Islands, France and Italy

Main Groups of Services for Non-Interconnected Islands offered by TPPs



Hard-to-abate reliance of Island Grids' on TPPs – Mix of Causes



Hard-to-abate reliance of Island Grids' on TPPs

Regulatory issues

- Bundled & Unbundled systems
- Grid codes formulated based on systems with TPPs
- Non-binding decarbonization targets for islands
- Absence of regulatory provisions for Grids Stability Tools to support clean energy transition

Hard-to-abate reliance of Island Grids' on TPPs

Technological issues

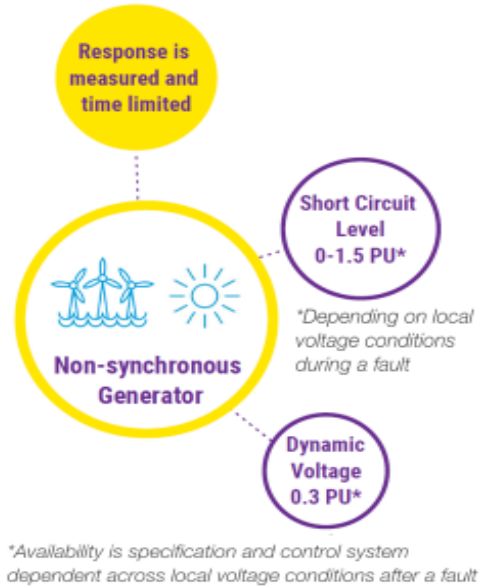
- Central control of energy management
- Grids developed around central dispatch
- Grids developed as uni-directional vs bi-directional needed
- Stable TPPs generation vs intermittent RES
- Deficit of Grid Stability Volumes from non-synchronous generation

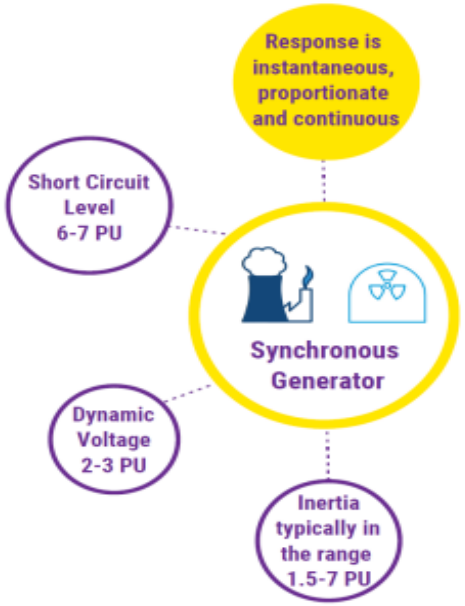
Hard-to-abate reliance of Island Grids' on TPPs

Market issues

- Market size constraints: limited business interest for new capacity & new grid-forming installations
- Absence of Motives for advanced RES & Grid Stability systems

Transition from fossil-fuelled units – Finding the missing Grid Stability





Major Islands' Grids Challenge for **Stability**:

⚡

Radical **Change in Generation** mix

Defragmenting Stability:

1. Serious emerging deficit of grids stability volumes:
   - inertia,
   - short circuit level,
   - dynamic voltage.

2. Missing Stability can be:
   (a) brought from interconnectors [fragile, under conditions],
   (b) created from synchronous components [planning]
   (c) missing!

Source: **National Grid ESO**, "System Operability Framework", 2018

Policy Recommendation: A grid stability toolbox for weakly or non-interconnected islands

The upcoming European Action plan on Grids is an excellent opportunity to help islands in the uptake of more variable renewable capacity.
The EU and/or relevant national authorities should do 3 things:

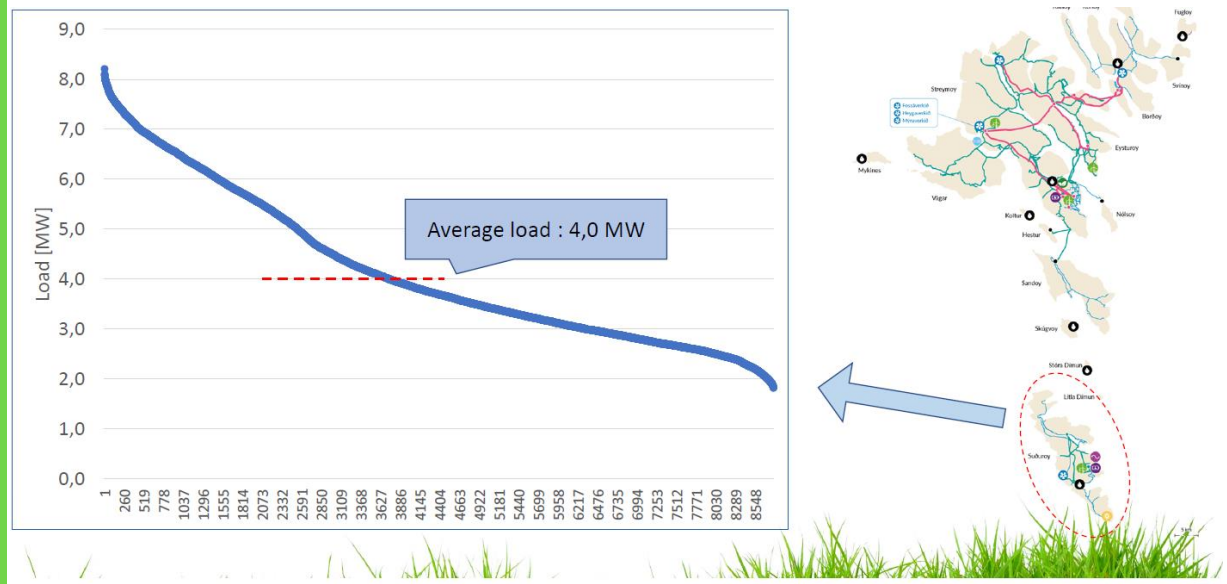
1. **Enhance Grid Stability Understanding: The Network System Operator responsible for each island electricity system should conduct a focused analysis on assessing its grid stability needs for inertia, short-circuit level and dynamic voltage, and propose detailed solutions based on generation capacity planning and different decarbonization scenarios.**

2. **Update Network Code and formulate Grid forming standards to reflect the decarbonization plans of islands: While there is a general and uniform approach to updating the Network Code, certain shortcomings exist. For instance, the absence of decarbonization targets for islands and criteria for integrating high levels of renewables. Provisions related to ancillary services, balancing services, and modern technologies and market practices facilitating renewable energy integration have not been fully implemented. Consequently, initiatives striving for high renewables participation on islands often rely on exceptions to the code. In some cases, the delay accumulated in specifying a "grid forming" regulation is also a barrier to a greater penetration of renewables.**

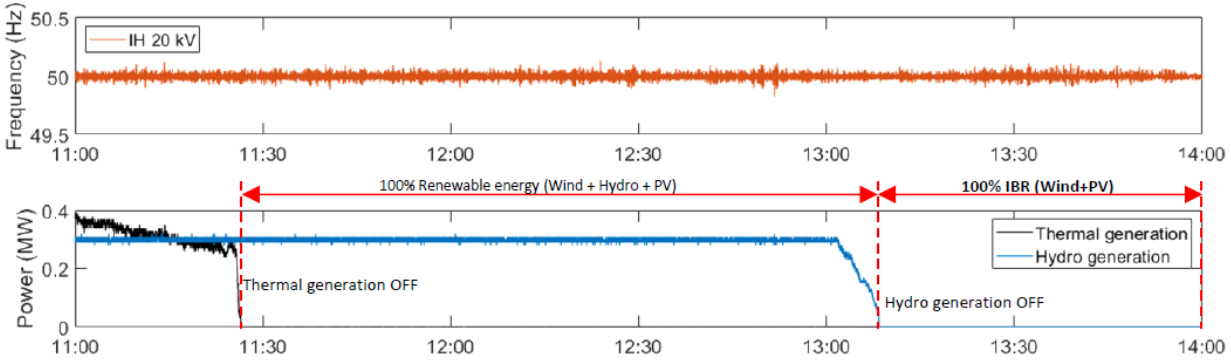
3. **Assess the implementation of a Grid Stability Toolbox: encompassing a range of measures and practices to ensure the reliability of electricity grids. The Network System Operator must ensure that a sufficient volume of inertia, short circuit level and dynamic voltage support is always available, both during their RES transition and afterwards. For this to be possible, targeted policy, market and technology adjustments will be needed, possibly including also the introduction of stability products from non-traditional sources.**

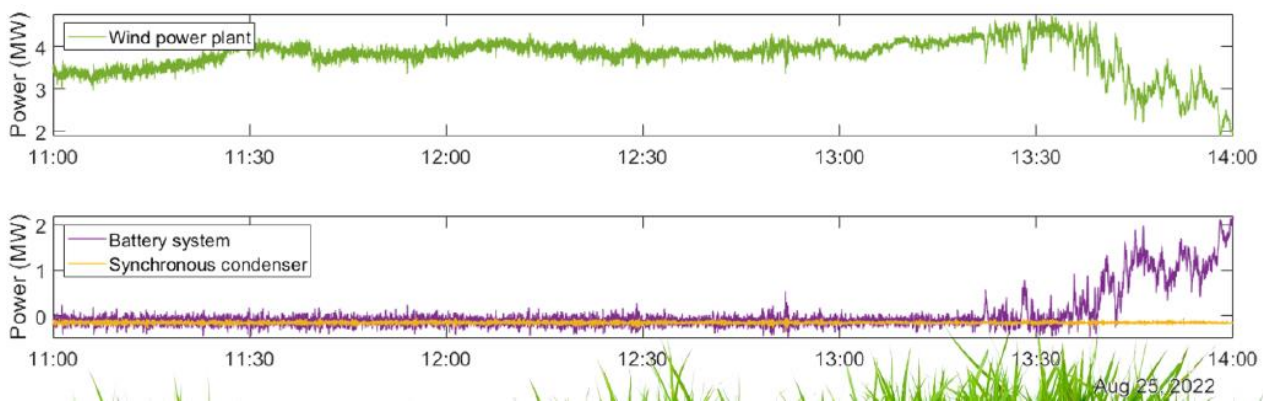
Best practices in Faroe Islands, France and Italy

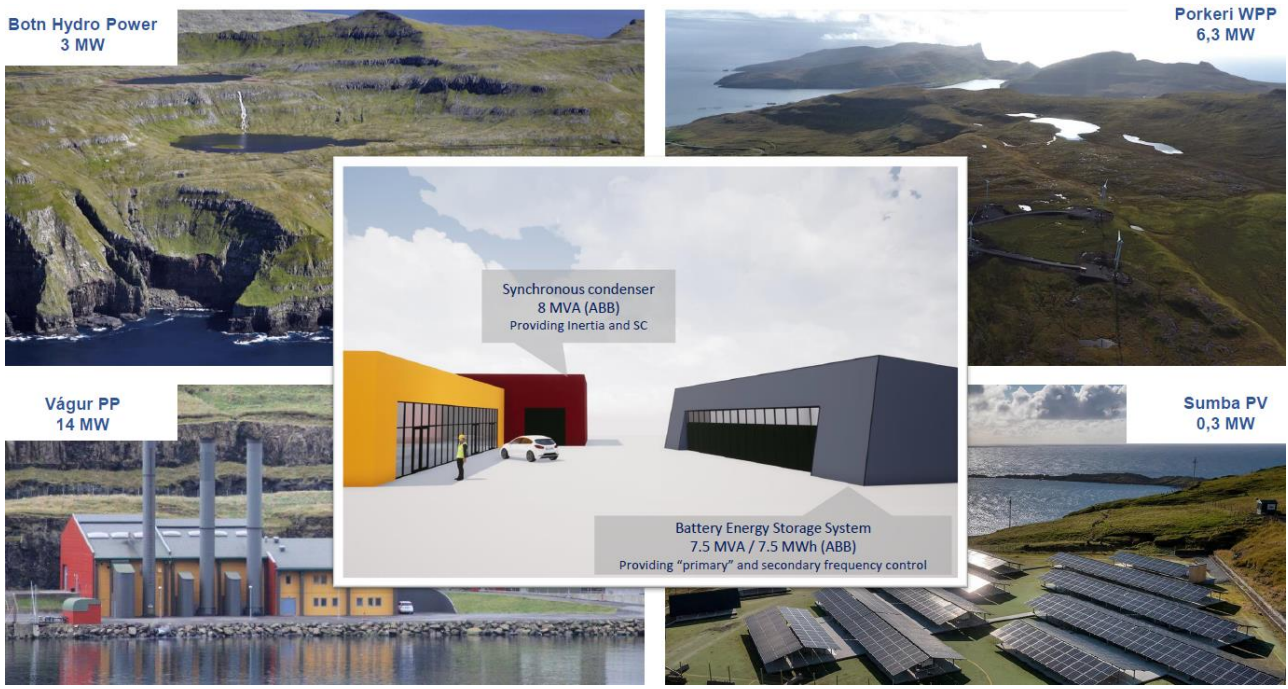
Infrastructure for Security of Supply – Faroe islands Good Practice example



Suðuroy - Load duration curve

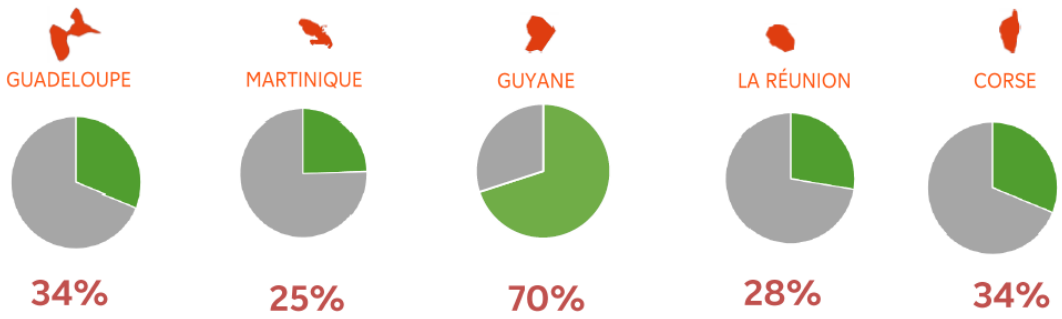






Source: **SEV** Faroe islands, 2023

Repurposing TPP to RES capacity – French Islands Good Practice example



Source: **EDF**, 2022

Source: **Albioma**, 2023

Le premier des douze moteurs de la centrale électrique de Port Est fonctionne désormais à la biomasse liquide, un combustible d'origine végétale permettant la production d'électricité verte. D'ici la fin de l'année, "la centrale sera entièrement convertie et ses douze moteurs fonctionneront uniquement avec ce combustible, issu d'huile de colza" annonce EDF. La biomasse liquide remplacera définitivement le fioul. Nous publions le communiqué complet ci-dessous (Photo EDF)

Market Size Consideration – Italian islands Good Practice example

Tender «Isole Minori» - Vulcano

Enel Produzione
e-distribuzione
Enel X
Enel Green Power

Area: 21 km²
Population: approx. 300
Distance from mainland: 27 km
MT lines: 4 for 27 km
Production: 6 U Diesel
Power: 8.850 kW
Consumption: 1.803 tonne/year
Demand: 7.280 MWh

A significant challenge of the project is the **difficulty in recuperating costs of investment**

PV plant Vulcano	
Proponent	Enel Green Power Italia S.r.l.
MWp	764.75 kWp
Production	1,3 GWh/year
ToE	286,87 t/year
CO2 reduction	1.061,9 t/year

- The PV plant is not covered by any grants
- Approximately 20% of the project will be covered by the grant
- Try to cumulate the grant with other types of funding

+ Renewables

+17,2% with the construction of a photovoltaic plant of +700kWp integrated with a battery of 1MWh

– Noise and pollution

The integration of a storage system and a **Micro Grid Controller**, allows for a increased efficiency of the diesel generator **(-7,4%)**

+ Security and - BLACKOUT

Better quality of service through installation of a **Micro Grid Controller, smart device and Optic fiber**

+ Mobility

Integration of **charging stations** for electric vehicles supplied by renewable energy sources

Source: **ENEL**, 2023

Thank you!

To get in touch for further discussion:

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