

ENTSO-E – AEE meeting

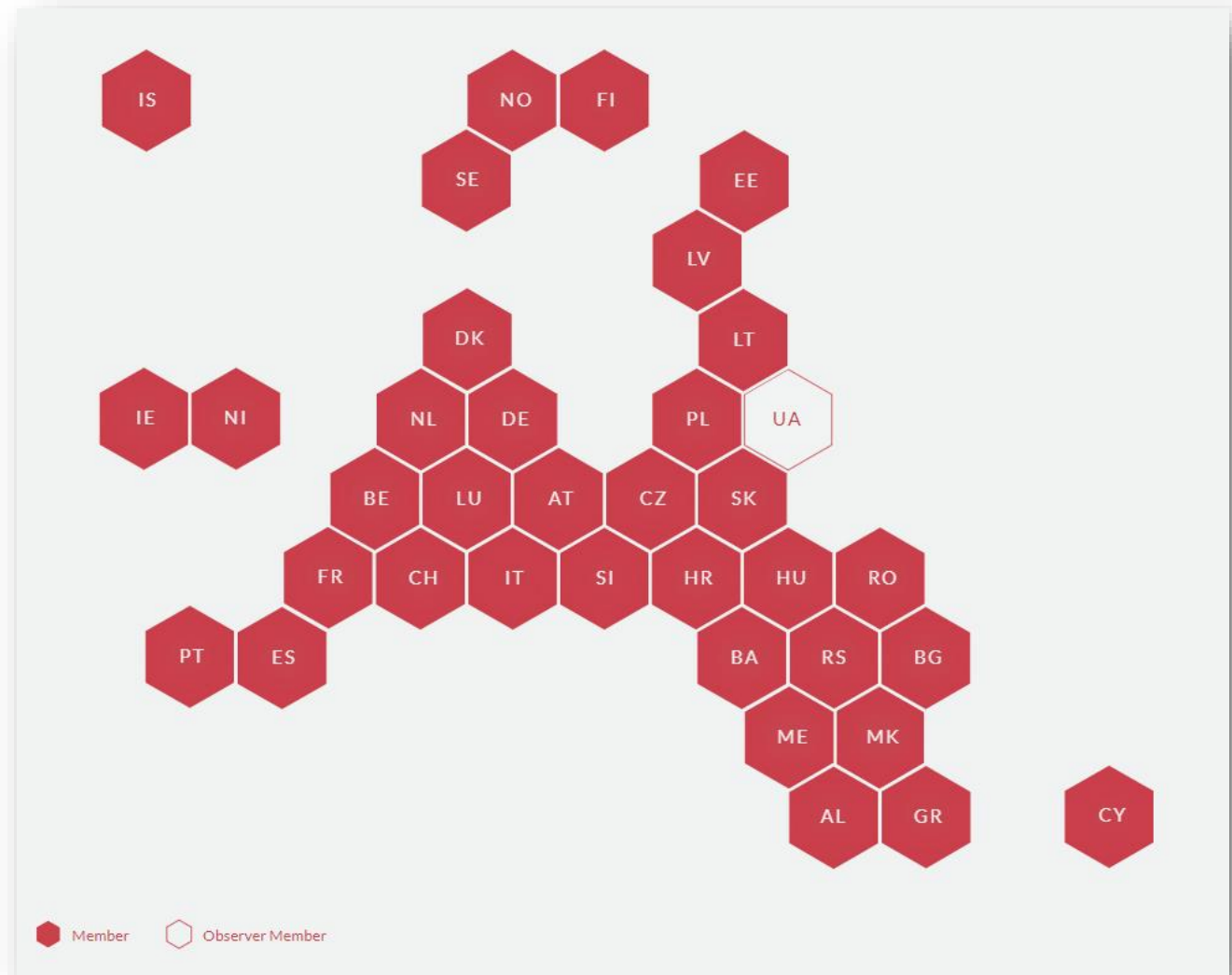
28 October 2022



About ENTSO-E

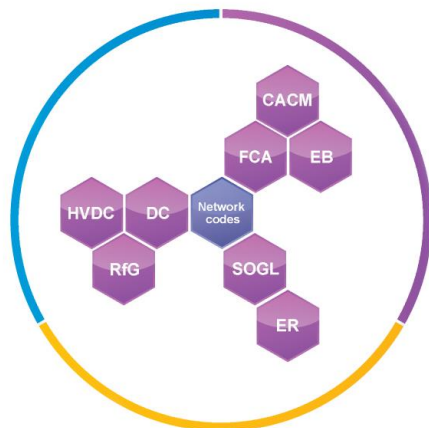
ENTSO-E, the European Network of Transmission System Operators for Electricity, is the association for the cooperation of the European transmission system operators (TSOs). **The 39 member TSOs representing 35 countries** are responsible for the secure and coordinated operation of Europe's electricity system, the largest interconnected electrical grid in the world. In addition to its core, historical role in technical cooperation, ENTSO-E is also the common voice of TSOs.

ENTSO-E brings together the unique expertise of TSOs for the benefit of European citizens by keeping the lights on, enabling the energy transition, and promoting the completion and optimal functioning of the internal electricity market, including via the fulfilment of the mandates given to ENTSO-E based on EU legislation.

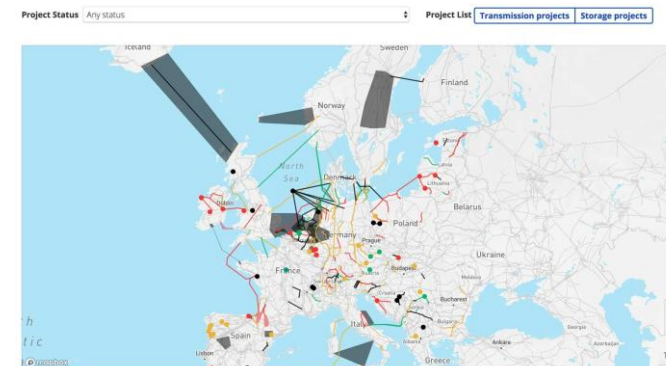


ENTSO-E main deliverables

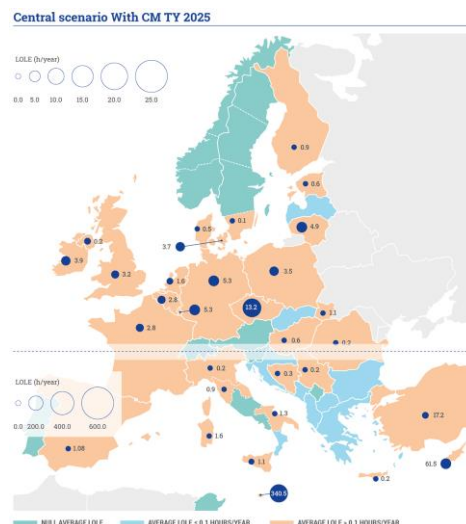
Network
codes and
Guidelines



Ten Year
Network
Development
Plan



European
Adequacy
Resource
Assessment



Transparency
Platform



Flexibility Team

Transmission & Distribution Interface

Demand Response / Distributed Flexibilities

Data Interoperability and Access

Common scenario building

Digital grids

Cyber-resilience

Operational Frameworks

SO GL implementation (e.g. CGMm)

NC E&R implementation

Data exchange requirements (KORRR)

Probabilistic Risk Assessment

SO ESC

Connection Network Codes

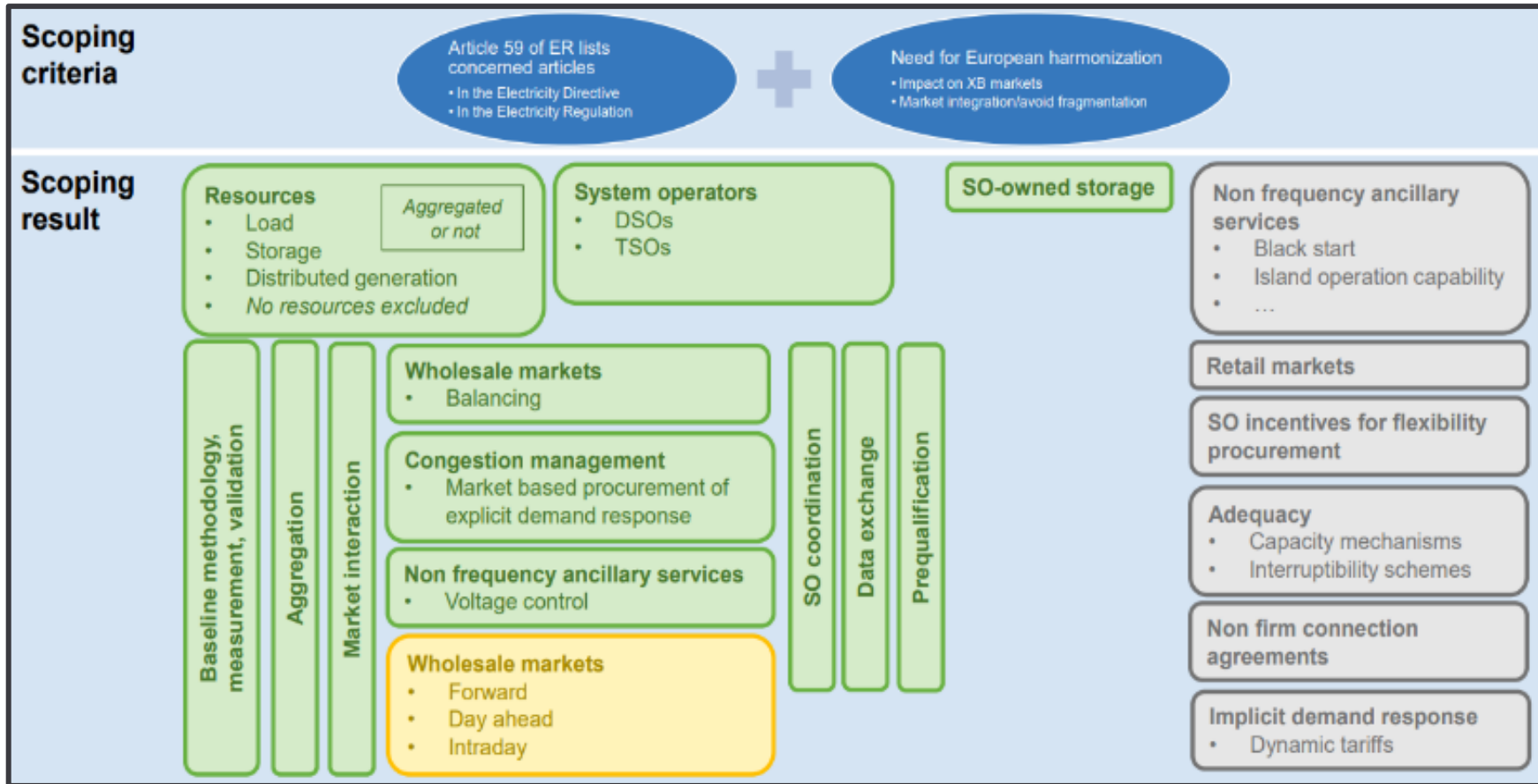
DCC, RfG, HVDC NC amendments

Implementation & monitoring

Standardisation

GC ESC and related EG

Towards a new network code on demand response



included

excluded

Indirectly addressed

Draft Framework Guideline

1. General provisions
2. General requirements for market access
3. Prequalification
4. Data exchange and SOs coordination
5. Congestion management
6. Voltage control

New EU rules (NC/GL)

- High level principles and requirements
- Terminologies
- Processes

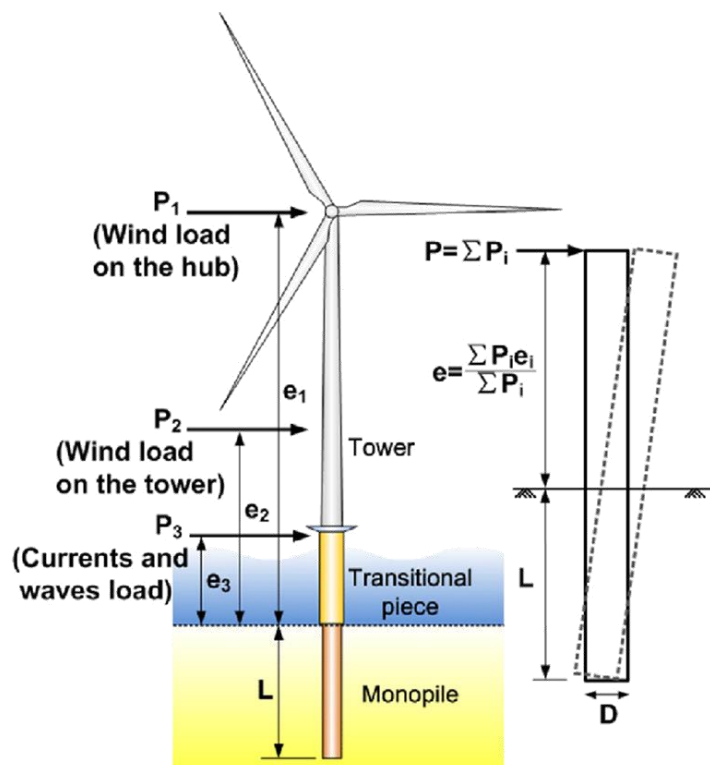
National framework

- Terms
- Conditions
- Methodologies

All SOs

NRA approval

RfG – Amendment on Art. 21.4: Active Power Forced Oscillations



Background of the proposed modification

- Analysis has shown that the active power tower forced oscillations can sum up between different wind parks.
- The forced oscillations are in the frequency range of the existing CE Interarea oscillation modes (i.e. 0,15 Hz-0,25 Hz).

Implications if the proposed modification is not accepted

- The planned and rapid expansion of wind generation could increase the interaction of windfarms with the ENTSO-E grid and stimulate larger, continuous oscillations, and influence negative the damping of the existing interarea modes.
- Forced oscillations from tower vibrations in offshore wind farms may grow and become a cross border issue.

Main points of the
ENTSO-E amendment
proposal for RfG
Article 21.4

- In Art. 21 (requirements for type C PPMs) a new article for type C PPM:
No control system or design characteristic of a power park module shall impose forced oscillations to the power system as periodic variation outside nominal frequency of any electrical quantity related to the power output at the connection point.

Entso-E proposal for Grid forming in RfG revision

Technical Requirement:

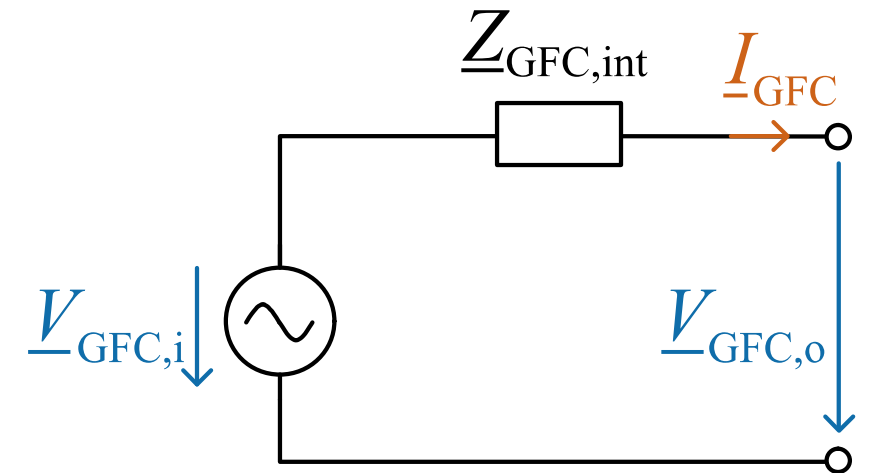
The PPM shall behave like a voltage source behind an impedance (Thevenin source with amplitude and phase)

In the first instant of a grid event, the source voltage shall remain stable, resulting in a change of current flow based on the impedance between grid and generating unit

During the event (after the first instant) the source voltage shall be adapted according to a predefined dynamic

If current reaches the current limit of the generating unit currents may be limited

Further definition regarding current limitation and predefined dynamic is delegated to the national implementation.



Our values define who we are, what we stand for and how we behave.
We all play a part in bringing them to life.



EXCELLENCE

We deliver to the highest standards.
We provide an environment in which people can develop to their full potential.



TRUST

We trust each other, we are transparent and we empower people.
We respect diversity.



INTEGRITY

We act in the interest of
ENTSO-E



TEAM

We care about people. We work transversal and we support each other.
We celebrate success.



FUTURE THINKING

We are a learning organisation.
We explore new paths and solutions.

We are ENTSO-E