The European Power Grid – ENTSO-E

ENTSO-E Objective: setting up the internal energy market and ensuring its optimal functioning, and supporting the ambitious European energy and climate agenda.

43 TSOs, 36 countries

500+ million citizens served

Significant electricity exchanges

+/- 480 000 km of interconnections
System Development: Different focus for different timeframes

- **Long term**
  - >10 years
  - Policy decisions

- **Mid-term**
  - Several years
  - Investment decisions

- **Short-term**
  - Several months
  - Operational decisions

Uncertainty increases
MAF Methodology: Probabilistic assessment

$M$ climate years of interdependent climate data

$N$ random draws for unplanned outages

$M \times N$ (Monte Carlo) sample years
Multiple Modelling Tools

Why?
• Benchmark the results – confident on the results;
• Enable regional/national studies using TSO’s tools

Challenges?
• Increased resources involved (ENTSO-E / TSOs);
• Very specific modeling guidelines needed – limit the freedom of different implementation and data interpretations;
• Strong central management needed.

Achievements?
• Higher confidence on the reported results.
Pan-European Adequacy Assessment: Mid-term Adequacy Forecast

Current Approach:

- Probabilistic market modelling;
- ~ 7 years ahead with 2 simulated years;
- Bottom-up approach, expectations of commissioning / decommissioning
  ✓ Data collection from TSOs
- No explicit CM considerations;
- NTC approach, flow-based only tested.
Pan-European Adequacy Assessment: Future Challenges

“Clean Energy for All” Package Implementation
What is the “Clean Energy for All” legislative package?

1. A package of measures to keep the European Union competitive as the clean energy transition changes global energy markets.

2. To foster growth, improve market design, investment incentives and energy efficiency.

Entry into force early July 2019.
Pan-European Adequacy Assessment: CEP deliverable methodologies

What does this mean for ENTSO-E and adequacy in Europe?
Three main methodology packages to be delivered:


2. Methodology for:
   • Cost of New Entry (CONE)
   • Reliability Standards
   • Value of Lost Load (VoLL)

3. Methodology for calculating the maximum entry capacity for cross-border participation to Capacity Mechanisms.
Pan-European Adequacy Assessment: Impact of CEP Implementation and New Challenges

What are the differences with current methodologies?

Current Approach:
- Probabilistic market modelling;
- 7 years ahead - 2 simulated years;
- Bottom-up approach and expectations of commissioning / decommissioning;
- No explicit CM considerations;
- NTC approach, flow-based only tested.
- No sectorial integration

Target Approach:
- Probabilistic market modelling;
- 10 years ahead - annual granularity;
- Economic viability of generation assets, integrated in the model;
- Integrated consideration of CM;
- Compliance with FBMC when available;
- Sectorial integration (P2X consideration)
Thank you!