Coping with Intermittency - The Network Challenge

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Energy Transition: the flexibility challenge is real

62% Of the generating capacity from variable RES in Global Climate Action 2040

756 Additional GW of wind and PV to be connected in Global Climate Action 2040

42% Higher installed variable RES capacity compared to peak demand

12 Countries with wind and solar outputs likely higher than 80% demand already in 2025

1. Distributed generation impacts the whole grid and power system
2. Enhancing and valuing the flexibility potential is fundamental
3. Cross-border flows take advantage of the variety of generation mix and patterns
4. Challenge for TSOs: access to the balancing services needed to maintain the security of the system in a cost efficient manner
How to cope with variability? – the ENTSO-E solutions

Can the current flexibility tools deliver under the new conditions? A multi dimensional response is needed, taking into account different time frames.

- Long term grid planing
- Network codes
- DSO/TSO cooperation
- Digitalisation
ENTSO-E Network code benefits

**Sustainability**
- 260 GW of RES connected
- 25 GW in 2016
- >10 GW of EU demand side response

**Security of supply**
- NO multi-state interruptions recent years
- Up to 300 coordinated tasks/day in a RSC
- Hundreds trained employees in RSCs programs and offices

**Competitiveness & Social Welfare**
- 23 states and 85% of European consumption market coupled
Measures to reduce RES integration cost (EBGL and CEP)

Make appropriate changes to relevant market mechanisms. These areas are:

1. Development of RES as a provider of Balancing Services

2. Adaptation of the market conditions to take into account the balancing needs brought about by RES and to take into account their constraints

3. Development of cross border balancing markets

4. Balancing Responsibility for RES
Technology disruption brings new solutions

Digital technologies enable a multi-directional and highly integrated energy system

➔ Connect the dots and enhance flexibility services
Bringing together flexibility providers and flexibility users

Technical and economical features

- Residential DSR
- SME & Buildings
- Industrial
In France, distributed flexibility resources provided 32 % of the contracted manual balancing capacity in 2016. This participation started in 2012 is identified as a main factor of a 20 % decrease in the manual balancing capacity procurement costs.
TYNDP: Building Future Power System vision

- New planning scenarios including one on **Global Climate Action**

- All meeting or exceeding EU targets. All **cocreated** with stakeholders

- **All data** sets available

- **More transparency** initiatives to come next year
Growing complexity into Grid Situational Awareness & Flexibility Management

Large Scale Interconnections

Distributed Energy Resources Integration

September 2016 in Denmark, one week
(source Energinet.dk)
Strive for Optimum Regional Security Cooperation