Active System Management and Distributed Flexibilities: the value of TSO-DSO Cooperation

Norela Constantinescu
Manager RDI ENTSO-E

Smartnet project, Arona Italy, May 16th 2019
Flexibility services are needed and evolving

10s flexible

100s+ units

1000s+ units!

TSO Balancing is evolving

DSO grid is facing challenges
Flexibility services: what does it mean?

Source IRENA
Which platform for which services?

Aggregators

Flexibility

Market Places

Commercial domain

Regulated domain

Grid Solutions

Data management and data access

Data Exchange Platforms

Flexibility asset

Aggregated Flexibility

Market places

Ancillary Services Cong. Management

Wholesale markets, frequency AS, possible Cong. Management

TSO grid management and system control, dimensioning of needs

TSO-DSO coordination

Non frequency AS Cong. Management

Frequency AS Non frequency AS Cong. Management

Selections

Flexibility asset

Flexibility asset

Non frequency AS Cong. Management

DSO grid management, dimensioning of needs

Ancillary Services Cong. Management

Grid solutions

Aggregated Flexibility
The toolbox of TSOs and DSOs to unleash flexibility potential, beyond network reinforcement: Active System Management

- Technical solutions using network assets
- Market-based solutions to activate explicit flexibilities
- Connection agreement solutions
- Tariff solutions to trigger implicit flexibility
- Rule-based solutions like curtailments, in last resort or emergency situations
Consumer participation, emerging actors and cooperation between DSOs and TSOs transform the electricity system and grid.

A common report at EU level on Active System Management to advise regulation on TSO-DSO cooperation

To coordinately use a set of market-based instruments to cost-efficiently and securely manage the electricity systems, across all timeframes and different areas.
Zoom on the market coordination scheme options

Option 1: separate TSO & DSO congestion management

Option 2: combine TSO & DSO congestion management

Option 3: combine balancing bids and congestion management
An Integrated system approach
The way forward for a complex, multi-layered and multi-dimensional energy system

Various actors to deliver different services at different scales

- TSO and DSO roles and responsibilities as system operators and as neutral market facilitators

- An efficient level playing field for market parties is required, fostering new services and valuing flexibility services

- TSO-DSO coordination on mutual processes and data exchanges between them to guarantee a reliable, efficient and affordable operation of the electricity system and grid, and to guarantee non-discriminatory and efficient market operation
Which platform for which functionalities?

### Aggregators
- **Decentralized Assets**
  - CROSSBOW (VSP)
  - Limejump; Next Kraftwerke
  - Newmotion
  - Powerhouse

- **Centralized Assets**
  - Direct participation of centralized actors (e.g. big consumers, chemical industry, greenhouses in the Netherlands)
  - To be investigated with SmartEn

- **Decentralized and Centralized Assets**
  - REstore; Innowatio; Orsted; e2m; Aggregio (EDF); Voltalis
  - EU-SysFlex (aggregation and coordination of flexibility multi-services)

### Flexibility Market Places

**Power exchange**
- Enera
- Nodes
- ETPA Stedin TenneT Alliander
- FLEXITRANSTORE Wholesale and Clearing Market

**TSO**
- Cross-Border Balancing (MARI, PICASSO, TERRE, CROSSBOW)
- Flexibility resource participation to AS (Italy)
- Flexibility resource participation to AS (Spain)
- Small-scale assets to FCR (the Netherlands)
- OSMOSE (near real-time cross-border wholesale market)
- NEBEF (France)

**Grid Solutions**

**TSO-DSO physical interface (control system)**
- CLASS (UK)
- FLEXITRANSTORE (substation controller with storage)
- SmartNet Italy (observability)
- TDI 2.0

**TSO grid**
- OSMOSE (coordinated control of devices, smart management of the system)

### Data Exchange Platforms

- **TSO-DSO**
  - TDX ASSIST
  - TSO-DSO Flex Datahub (Belgium)
  - DA/RE (Germany)
  - EDSN (the Netherlands)

- **TSO**
  - Estfeed
  - Energinet
  - EIHub
  - CROSSBOW (real-time data)
  - EU-SysFlex (cross-border and cross-sector data management)

- **DSOs’ ownership**
  - Atrias (Belgium)
  - MRSO (Ireland)

- **Third Party**
  - SII (Italy)

### Blockchain
- Small-scale assets to aFRR (the Netherlands; Germany)

### Other third party
- Piclo (technology provider)
- Cornwall (supplier)
Thank you for your attention..