An Integrated Platform for Increased FLEXIbility in smart TRANSmision grids with STORage Entities and large penetration of Renewable Energy Sources

Project presentation
Agenda

The Project
Objectives
Technical Framework
Demonstrations
Impact and Exploitable Results
The Partners
About FLEXITRANSTORE

**Project Grant Agreement No. 774407**

**Budget:** 21.7 M Euro  
**Grant:** 17 M Euro  
**Start:** 1 Nov 2017 (M1)  
**End:** 31 Oct 2021 (M48)

**LCE-04-2017 call:** Demonstration of system integration with smart transmission grid and storage technologies with increasing share of renewables

---

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 774407
Objectives

To enhance and accelerate the integration of renewables into European energy systems, especially addressing imbalances

To increase cross border electricity flows across Europe

At a technical level:

→ Develop a next generation of Flexible Energy Grid (FEG), which provides the technical basis to support the valorization of flexibility services, enhancing the existing European Internal Energy Market (IEM)

At a market level:

→ A wholesale market infrastructure and new business models should be upgraded to network players, incentivize new ones to join, while demonstrating new business perspectives for cross border resources management and energy trading
FLEXITRANSTORE Project aims to increase flexibility:

1. Across the Energy Industry Value Chain:
   Integrating Battery Energy Storage Systems (BESS) at different grid connection points: TSO/DSO border substations and Wind Farms and synchronous Gas Turbine Plants

2. In the transmission grid:
   Power Flow Controllers for the first time in the SEE region, Dynamic Line Rating (DLR) sensors and algorithms, efficient controllers for active substations at the TSO/DSO border and Wind Power Plant (WPP) connections to High Voltage networks

3. In the distribution grid:
   Enhancing demand-response mechanisms using the TSO/DSO controller

4. At conventional generators:
   Installation of Power System Stabilizers (PSS), development of a representative grid model at plant level

5. Within the wholesale electricity markets:
   Integrated market platform based on an enhanced EUPHEMIA market model
FLEXITRANSTORE Project will implement technologies and novel concepts aiming to:

• Create a pan-European energy Market under a common framework free of national restrictions and legislative barriers imposed by individual nations.

• Integrate the South Eastern European energy markets, where market coupling activities are progressing slowly.

• “Touch” different grid flexibility resources: improved operations, grid modernization, demand response, fast ramping supply, energy storage.
Demonstrators

FLEXITRANSTORE will create 8 demonstrations in 6 countries. The demonstrators are divided into three layers, according to their application point across the energy value chain.

- **Layer 1**: Flexibility at transmission connection points: Production and demand.
- **Layer 2**: Increasing cross border capacity and clean energy flows.
- **Layer 3**: Flexibility entering the market.
1. **Active Substation Controller with storage integration at the TSO/DSO interface** (site: Cyprus)

2. **Active Substation Controller with storage integration at the Wind Park Plant Substation** (site: Northern Greece)

3. **Dynamic Line Rating** technology (sites: Slovenia, North Eastern Bulgaria)

4. **Power Flow Control devices** – Power Line Guardian (sites: Southern Bulgaria, Southern Greece)

5. **Wholesale market** demonstration and clearing (sites: Bulgaria, Cyprus)

6. **Active Substation Controller in Hardware In the Loop** (HIL) demonstration (site: Virtual lab in Spain)

7. **Plant Integrated Battery Energy Storage System in GT generator** (site: Belgium)

8. **Robust Conventional Generation plant through Power System Stabilizer** (site: Belgium)
Demonstrators – Layer Division

Layer 1:
- Flexibility at transmission connection points:
  - Production and demand

  D4 PI-BESS
  D5 Robust-GEN

Layer 2:
- Increasing cross border capacity and clean energy flows

  D6 De-icing
  D7 PFC

Layer 3:
- Flexibility entering the market

  D8 New wholesale market approach with flexibility services
Impact

• Develop new policies governing the energy exchange and the energy markets.

• Include new actors and players.

• Transform the European Internal Energy Market (IEM) according to the framework defined by the ENTSO-E and the ETIP-SNET Roadmaps.

• Contribute towards higher RES penetration and CO2 levels reduction.

• Utilize available energy and distribute the available capacity more efficiently, thus reducing costs.
Exploitable Results
The Partners
Thank you very much for your attention!!