



FARCROSS

# Demo A.1: Technical factsheet

## Unlocking Cross-Border Capacity with Modular Power Flow Control (MPFC) Technology

This demo is focused on increasing cross-border network capacity in the SEE region. The aim is to deploy MPFC technology at an optimal location on the network to reduce congestion and unlock more capacity on the existing network. The operational, cost, and societal benefits will be evaluated over the project, including impact on congestion, network capacity, and renewable integration.

### Major Impact Factors:

- Unlock cross-border capacity on congested lines between Greece and Bulgaria
- Strengthen existing transmission corridors to support secure operation in normal and contingency scenarios.
- Enable faster integration of renewable energy and contribute to reduced renewables curtailment
- Operational flexibility for Greek and Bulgarian TSOs .
- System benefits for the intraday and real-time markets.

DEMO LEADER

SMART  WIRES



*“This project is using next-generation power flow control technology to increase cross-border capacity in the SEE region, and accelerate progress towards a cleaner greener future for all”* - Catherine Winning, Smart Wires

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### Technology Types:

- Single phase **Modular Static Synchronous Series Compensator (mSSSC)**.
- **ISM** (Industrial, Scientific, Medical) radio signal communication.
- **Substation SCADA and RTUs** for live data acquisition.

### Components:

- **SmartValve™** injects a leading or lagging voltage in quadrature with the line current, to increase or decrease power flows on a circuit and perform dynamic services.
- **PowerLine Coordinator and PowerLine Gateway** support connection of the SmartValves with the TSO's EMS (Energy Management System).
- **SmartInterface** is the platform used for managing the SmartValve deployment

### Fields of Application:

- N.Santa – Iasmos HV Transmission Line (Greece – Bulgaria borders): selected as optimal location for deployment, due to frequent congestion issues.
- **N -1 Contingency scenarios** as Use Cases:
  - Transmission Line Xanthi – Iasmos out of Service.
  - Komotini Power Plant out of service.

### Expected Benefits:

- Optimal power flow reconfiguration and reduction in congestion.
- Reduction in curtailment of Renewable Energy plants.
- Increase of cross – border transfer capacity.
- Strengthened regional and cross – border network in contingency scenarios.
- Improved market coupling for neighboring countries.

### Technology Readiness Level (TRL):

- The deployment of the demo was completed in October, 2021, with a TRL 7.
- Operational data will be acquired and interpreted for the following 3 years.
- It is expected that a TRL 9 will be achieved by the end of the FARCROSS project in 2023

