

Pilot Italy

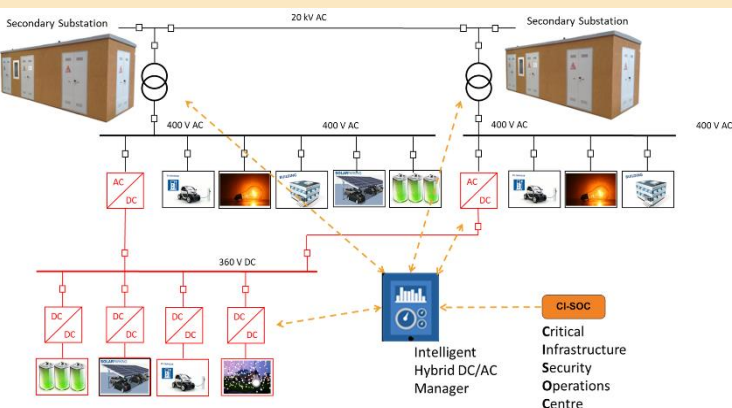
Objectives: demonstrating the potential offered by a more modular (cellular) smart hybrid AC-DC decentralized operation of MV/LV electricity grid, with a view to increase grid operation efficiency, reduce reverse power flow towards MV and reduce cyber-security risk.

Interconnection of:

- One HV/MV feeder that connects four MV/LV substations; LVDC interconnection at 360 V
- 490 kW intermittent peak power from PVs generation

Activities for hybrid AC-DC grids:

- Integration of LV DC microgrid in the distribution system, which will connect through DC infrastructure
- Connection of new DC devices: BES, EV, PV, commercial and residential loads
- A new public 50 kW DC bidirectional electric vehicle charging station, coordinated with the needs of grid operator



CONTACT

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EUROPEAN PROJECT

Innovation and application of direct current and hybrid alternating current- direct current grid technologies



HORIZON 2020

LC-SC3-ES-10-2020

HYPERRIDE: Hybrid Provision of Energy based on Reliability and Resilience by Integration of DC Equipment

ABOUT

Overview

Starting Date: 1 October 2020

Duration: 4 years

Funding: European Union Horizon 2020 Research & Innovation Programme

Project Type: Innovation Action Budget: 7 Millions Euro

HYPERRIDE is a European project founded under the call H2020 "LC-SC3-ES-10-2020 – DC – AC-DC hybrid grid for a modular, resilient and high RES share grid development".

With demonstrations in three virtually linked countries (Germany, Switzerland and Italy) different application foci are covered with still relevant synergies as a proof of applicability of HYPERRIDE.

Objectives:

- Planning, operation and automation solutions
- Development of enabling technologies (MVDC circuit breakers and sensors, DC measurement unit, open ICT platform)
- Fault management and cybersecurity (protection coordination, stability assessment, automatic grid reconfiguration)
- Technology demonstration
- Effective business models & knowledge transfer, recommendations for standardization/ regulation bodies

Pilot Switzerland

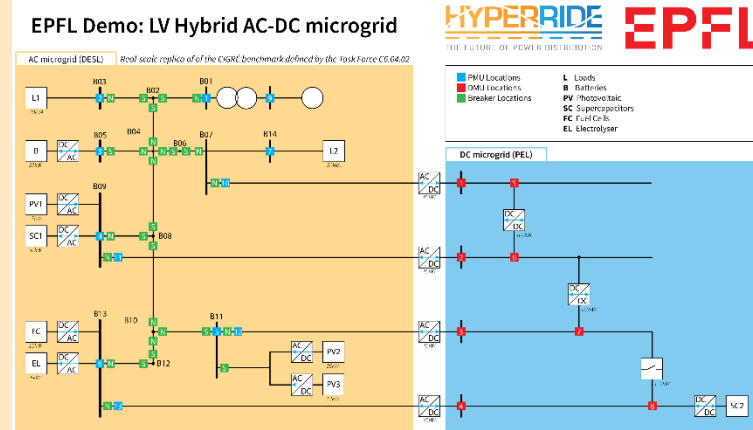
Objectives: testing optimal control strategies for hybrid AC-DC grids as well as adaptive reconfiguration approaches.

Interconnection of:

- Distributed Electrical System Laboratory (DESL): CIGRE 15 node LVAC benchmark
- Power Electronics Laboratory (PEL): LVDC (750 V)

Activities for hybrid AC-DC grids:

- Optimal control, including real-scale renewables (PV, EV and heat pumps)
- LVAC applications: PV, BESS, EV-charging, fuel cell, supercapacitor, electrolyzer, hydro oxygen storage, heat pump
- Protection coordination and DC circuit breakers performance
- Local vs. Global grid stability



Pilot Germany

Objectives: demonstrating different hybrid AC-DC architectures to increase the technology readiness level of key enabling technologies and systems

Purpose of the measurement: stability and harmonic analysis (network monitoring, protection and power quality)

Interconnection of:

- 5 km MVDC cables connecting three locations; wind power test bench (4 MW turbine)
- Two MVAC connections to different grid operators; Large portfolio of high power DC/DC and DC/AC converters

Activities for hybrid AC-DC grids:

- MVAC coupling via MVDC; LVDC distribution to interface DC based prosumers
- Test energy services: Optimal Power Flow (OPF) and fault management
- Validation of DMU for advanced observability and state estimation

