

EUROPEAN PROJECT

DC and Hybrid AC-DC Grids

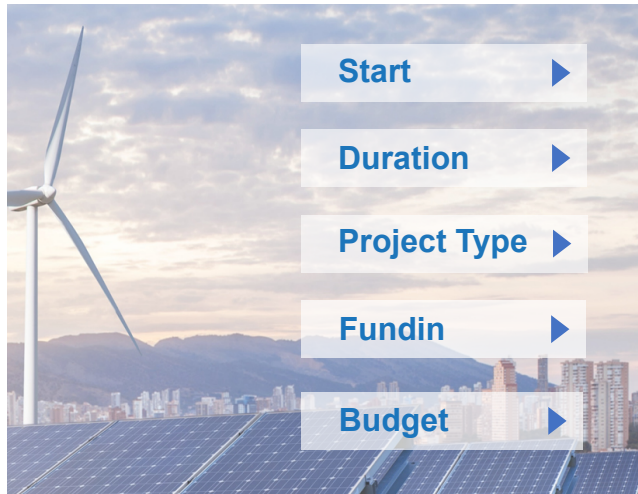


HORIZON 2020

Hybrid Provision of Energy based on
Reliability and Resiliency by Integration of
DC Equipment.

ABOUT





Overview



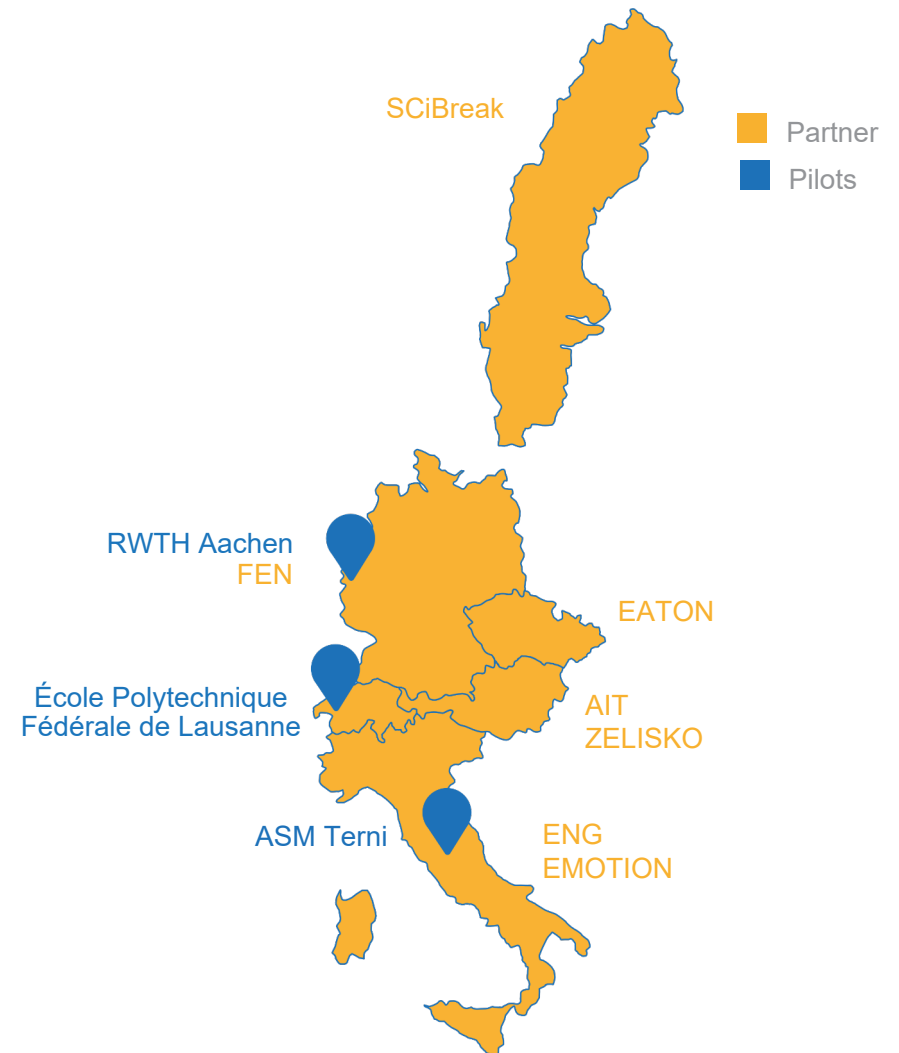
Start ▶	1 October 2020
Duration ▶	4 years
Project Type ▶	Innovation Action
Fundin ▶	European Union Horizon 2020 Research & Innovation Programme
Budget ▶	7 Million Euro

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”.

Objectives:

-  Planning, Operation and Automation
-  Demonstration
-  Enabling Technologies
-  Effective Bussiness Models
-  Fault Management and Cybersecurity
-  Effective Knowledge Transfer

CONSORTIUM



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.

DEMOS

Pilot Switzerland

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

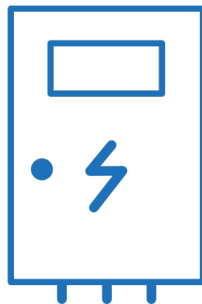
Interconnection of:

DESL



Distributed Electrical System Laboratory (DESL) with CIGRE 15 node LVAC benchmark (1.5 kV)

PEL

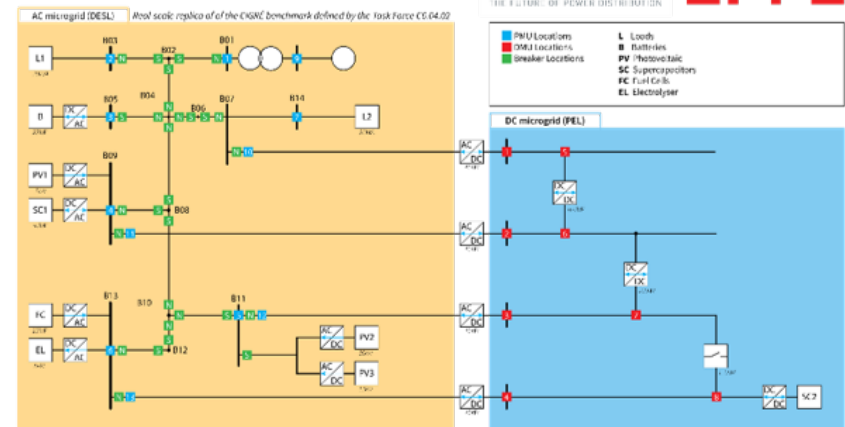


Power Electronics Laboratory (PEL): LVDC (750 V)

Activities for hybrid AC-DC grids:

- Optimal control, including real-scale renewables (PV, EV and heat pumps)
- LVAC and LVDC 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

EPFL Demo: LV Hybrid AC-DC microgrid

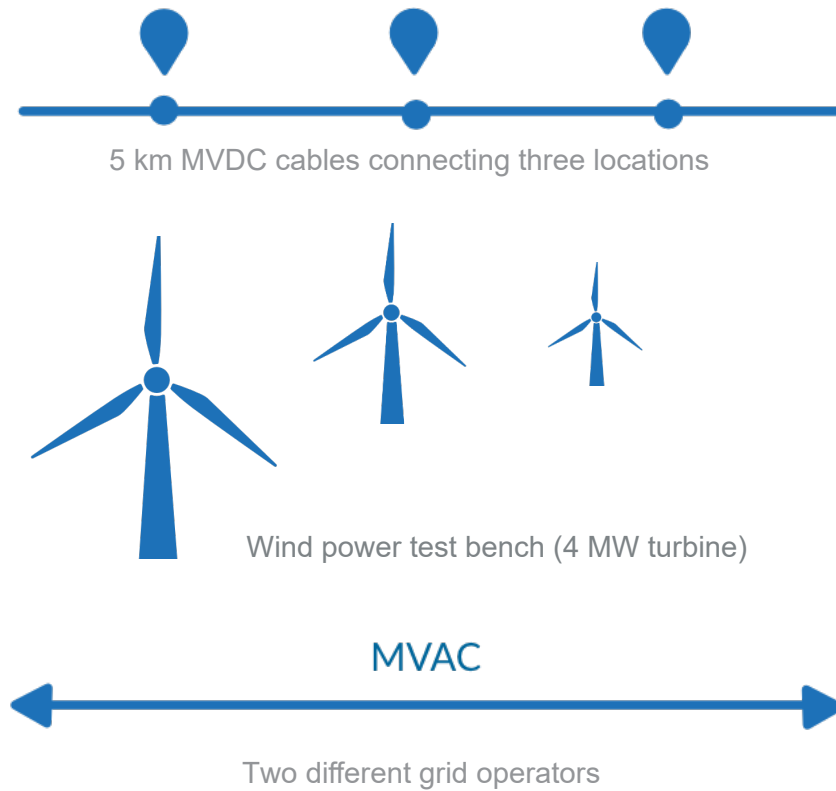


Pilot Germany

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

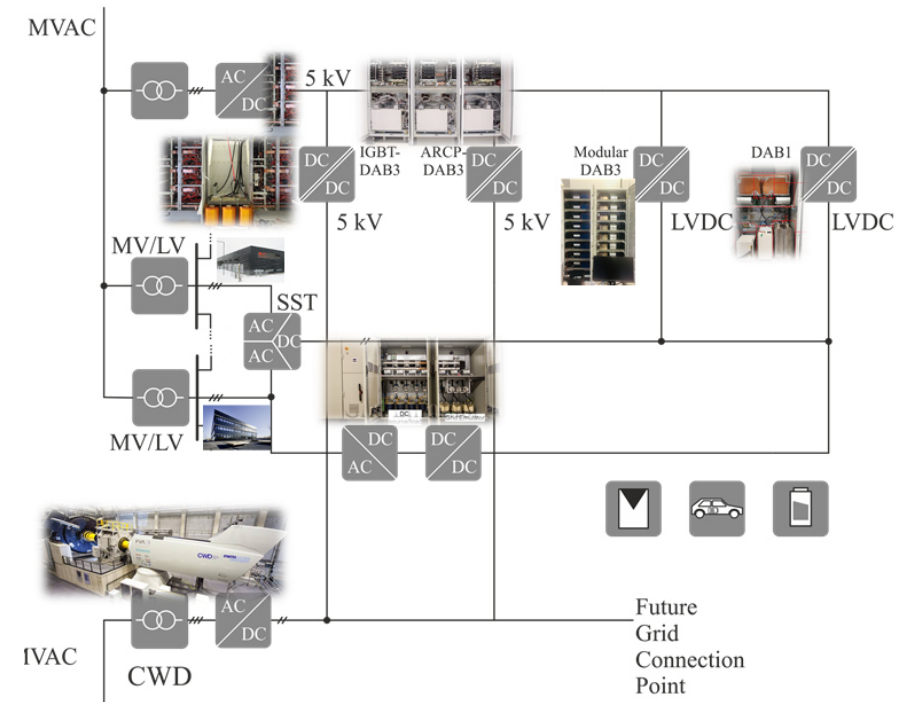
Purpose of the measurement: stability and harmonic analysis (network monitoring, protection and power quality)

Interconnection of:



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
- LVDC distribution to interface DC based prosumers

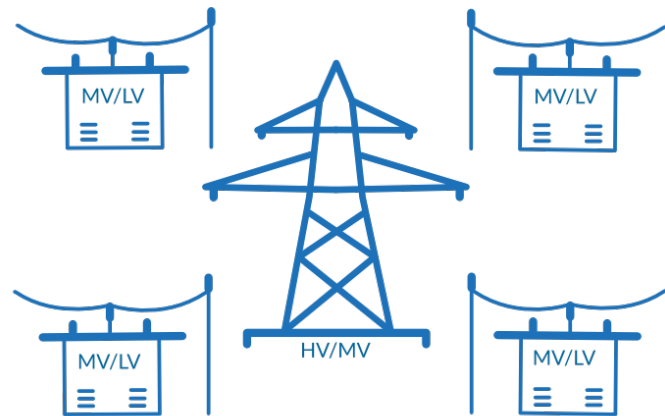


Large portfolio of high power DC/DC and DC/AC converters

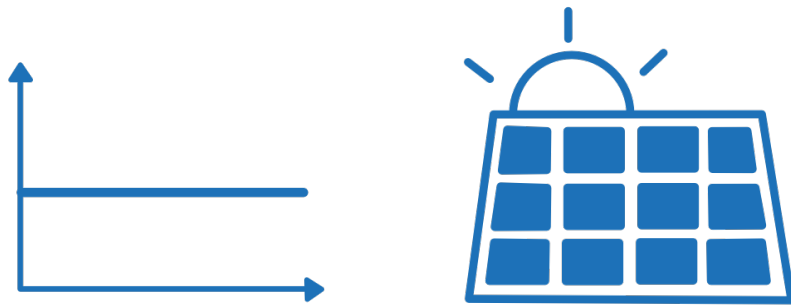
Pilot Italy

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

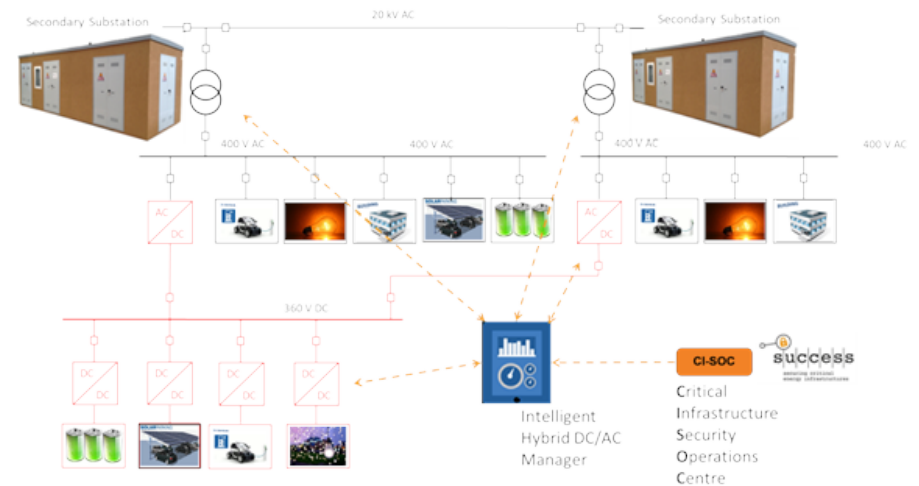


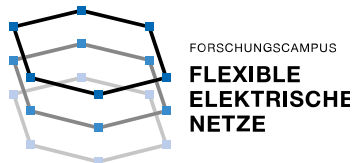
LVDC interconnection at 360 V

490 kW intermittent peak power from PVs generation

Activities for hybrid AC-DC grids:

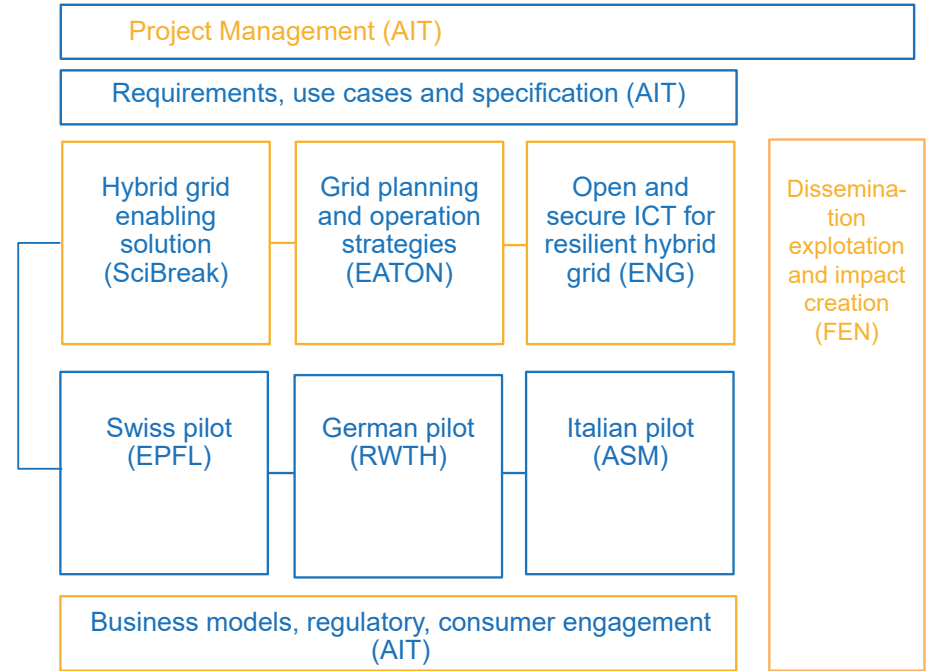
- Integration of LVDC microgrid in the distribution system, which will connect through DC infrastructure
- Connection of new DC devices: BES, EV, PV, commercial and residential loads
- A new public 50 kW DC bidirectional electric vehicle charging station, coordinated with the needs of grid operator





STRUCTUR

Work Package



HYPERRIDE addresses these new cases and will provide clear recommendations for distribution grid applications and will utilize the technologies and concepts of the rather very local or isolated state of the art DC applications. Potential transition paths to proposed future (large-scale) distributed industrial or DSO grids will be defined and demonstrated as outlined in the workplan.

CONTACT

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