

Best Paths Project: the largest project ever supported by the European Commission RDD Framework Programs within the field of power grids

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Abstract

BEST PATHS ('BEyond State-of-the-art Technologies for rePowering AC corridors and multi-Terminal HVDC Systems') project involves 39 partners from 11 countries and with a budget of 63 million Euros that will be 56% co-funded by the European Commission under the 7th Framework Programme for Research, Technological Development and Demonstration. It is coordinated by Red Eléctrica de España (REE), and is set to run until September 2018. The project is developing and testing high-capacity grid technologies allowing larger capacity and flexibility of the network, and further integration of renewable energies into Europe's energy mix. The project's five large-scale demonstrations aim to validate the technical feasibility, costs, impacts and benefits of the tested grid technologies. Their main objectives are:

- Demo 1: to move from HVDC lines to HVDC grids. It is due to demonstrate and validate some important issues to keep on HVDC grid the same reliability standards as those achieved for HVDC links. It is needed to investigate the behaviour and the interactions between the HVDC link converters and the wind turbine converters, with special attention paid to the control system design aspects and the behaviour when a fault occurs in the DC grid.
- Demo 2: to secure that multi-terminal HVDC grids can rely on interoperable VSC terminals, especially when supplied by different vendors. This underscores the need of providing guiding foundations to establish interoperability standards in order to maximize the reliability of the future DC grids.
- Demo 3: to design, develop and test new technological solutions for all HVDC system elements (converters, submarine cables, land cables, conductors and insulators for DC overhead lines, fault location in DC cables) within a process of complete refurbishment and uprating of existing HVDC link.
- Demo 4: to research High Temperature Low Sag (HTLS) conductors and insulated cross-arms for repowering AC lines as well as to validate innovative design, field working processes and low cost dynamic line rating (DLR) system in order to increase lines capacity.
- Demo 5: to design, build and perform a type test of a full scale (several meters long) HVDC MgB₂ superconducting cable. These studies will be used to estimate the losses on the transmitted power for different scenarios and an estimation of the reliability of the overall system and its availability.

The experimental results obtained in the different Demonstrations will be integrated into European impact analyses by 2018, to show the scalability of the solutions and benefit replication across the pan-European transmission network and electricity market.