

Innovative DC Solutions for Grid Reinforcements

A collaborative project proposal

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Context

Renewable energy sources are usually built in remote areas, far from major consumption zones. Consequently, the energy produced there needs to be transported over long distances, often across borders of different European countries or even to neighbouring continents. Today, many AC transmission lines, especially cross-border interconnections, are close to their full load capacity and all the while electricity consumptions is growing and the seamless integration of renewables into the grid requires even more interconnections. The existing transmission system that relies mostly on AC assets is close to its limit and needs to be reinforced.

Current technologies & limitations

Conventional ways of increasing power in the AC system:

- + Compensation and FACTS devices
- + Reconductoring with HTLS conductors
- + Increasing line voltage capacity via current uprating
- + Creating new corridors or expanding the existing ones

Limitations of these options:

- + Acquiring new ROW is often very difficult
- + Mostly marginal power increases

Proposed solution

Transforming existing AC transmission lines into DC lines, which offers:

- + Advanced power flow and stability control features
- + An increase in transmitted power, using the same ROW
- + A faster timeframe for projects, due to permit and acceptance issues
- + A cost effective and rapid roll-out solution
- + Continuity of service during technology upgrade

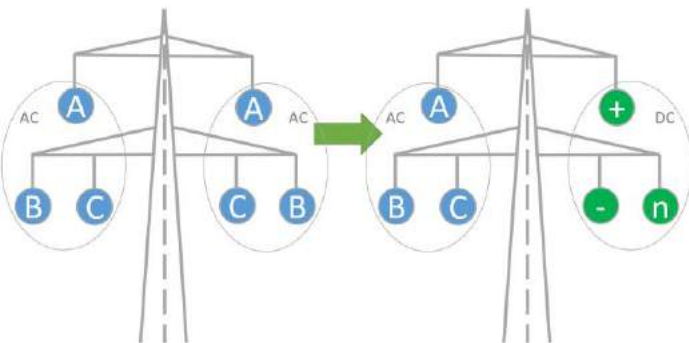


Figure 1: Example of upgraded AC transmission line to hybrid AC/DC line

Potential technological challenges

- + Identifying constraints & expectations
- + Studying system interactions
- + Identifying and evaluating new technologies
- + Overall system cost optimisation
- + Maintaining service continuity
- + Operation and maintenance

Project objectives

- + Build a consortium with a high level of expertise, able to provide rapid, concrete and efficient solutions
- + Work on a commonly agreed methodology resulting in a selected technology and design specification
- + Develop the necessary tools and technologies
- + Provide a demonstration of the full methodology on a real corridor refurbishing project

The ideal consortium

Innovation & Research Centre:

- + Project Coordination
- + Advanced Research (System & technologies)
- + Techno-economic analysis

OHL technology provider:

- + Asses the condition of existing lines' structures
- + Complete mechanical studies of new line systems

System Operator:

- + Define system level studies and requirements
- + Cost Benefit Analysis
- + Operational requirements
- + Fulfilling new requirements, depending on different countries' regulations

Your benefits as a participant

- + Develop your business in emerging markets
- + Pioneer a new way of reinforcing the electrical grid
- + Participate in cost effective RES integration
- + Apply the technology and principles in your other projects
- + Benefit from R&D funding to maximise competitiveness

Proposed Timeline

