



## NEWSLETTER December 2025

Co-funded by the European Commission's Horizon Europe programme, "Enabling interoperability of multi-vendor high-voltage direct current (HVDC) grids" (InterOPERA) brings 21 European partners together to unlock the potential of HVDC grids and to enable the large-scale transition of the European energy sector.

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### 5th General Assembly

The InterOPERA project held its fifth General Assembly from 16-18 September in Aarhus, Denmark. Hosted by Vestas, over three days 21 partners met to review project progress and discuss long-term goals across the Work Packages. The discussions focused on final demonstrator specifications, and test protocols and coordination. The General Assembly also included a practical workshop covering offshore HVDC project procurement strategies, data management and consortium agreement, and exploitation strategy.



## Updates from Work Packages

### **Work Package 1 “Development of standardised interaction study processes and interfaces”**

Over the past few months, the team conducted dry-run tests in both offline and real-time environments.

In the offline environment, the laboratories conducted iterations with vendors, focusing on improving the quality of the models and facilitating their integration into the test environment. The dry-run tests with all vendors are now nearing completion, confirming the relevance of the requirements and the vendors’ ability to provide the necessary models. When fully completed this will allow a smooth transition to offline demonstrator tests.

The laboratories and vendors also carried out tests in real-time environments. Managing the interfaces between the replicas and the two brands of real-time simulator presented challenges. But we expect to demonstrate the feasibility of this process. It would be one of the major outcomes of the dry-run phase. These tests will continue until the end of the year.

The team in Work Package 1 started a new task *Development of practices and guidelines to limit interoperability issues*. This task will build on experience gained from within InterOPERA for providing models and replicas, preparing test platforms, and running interaction studies during both the dry-run and the demonstrator phases. The task is led by Equinor and will prepare an implementation guideline for multi-vendor HVDC interaction studies. The aim is to produce a practical guideline for wider dissemination and use beyond InterOPERA.

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### **Work Package 2 “Requirements and assessment of interoperability for multi-vendor multi-terminal HVDC systems”**

In the third quarter of 2025 the team worked extensively on finalising the last details for the testing procedures of the demonstrator set-up. Testing protocols for the three-terminal topology have been completed. And work on defining the tests for the five-terminal topology are now underway. These tests should be completed by the end of the year and will be based exclusively on offline simulations.

Control and protection hardware for all vendors has been installed in the laboratories. They are waiting in the meantime for both the Work Package 1 dry-run tests to conclude and the software update to begin integration studies for the Demonstrator. We also defined the scope for verification and prequalification schemes and got to work. We made progress on the simulation platform, which allows various vendors to carry out integration studies remotely in offline simulations by using a virtual DC connection point without access to other vendors’ intellectual property and models.

Finally, the development of the DC grid connection code requirements is moving ahead in coordination with Work Package 5, where project specifications are jointly developed.

Generic ElectroMagnetic Transients (EMT) offline models are being prepared. Work on an EMT simulation platform (EMTP) is also advancing. This platform could allow any vendor to run offline simulations by connecting their model at the defined connection point without needing access to the full system.

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### **Work Package 3 “Multi-vendor multi-terminal demonstrator project”**

The core work of Work Package 3 is shifting back to each vendor’s site, where the teams are implementing and adjusting the models that will power the demonstrator. The transition from design to execution marks a major step, as vendors will translate shared specifications into operational solutions while coordination continues across the consortium to keep progress aligned.

The task to draft detailed functional specifications was completed in September and the report Detailed Functional Specifications, giving vendors a stable technical baseline, has been approved by all parties and published. Likewise, a report has been approved summarising the key findings from the grid studies performed by RTE International. While the full studies are not publicly available, RTE has distilled the insights into scientific papers presented at the Wind & Solar Integration Workshop in Berlin this summer, also available at [InterOPERA publications webpage](#).

Looking ahead, updates from this Work Package will become leaner as the project moves into the test phase, led by TenneT NL. With specifications consolidated and models under implementation, the next period will focus on testing and validation—practical steps that bring the interoperable demonstrator closer to reality.

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### **Work Package 5 “Procurement Strategy and Future Projects Preparation”**

In the third quarter of 2025, Work Package 5 progressed on its core goal - formulating a comprehensive procurement strategy for future Multi-terminal, Multi-vendor High Voltage Direct Current projects. The team completed a cost-benefit exercise that compares different tender setups for future projects and weighs their value, risk, and performance. This analysis gives buyers a clearer picture to pick an option that delivers long-term system benefits.

The legal team completed a draft version of contract recommendations tailored to the first Multivendor projects. The proposed tendering approach was endorsed by stakeholders at InterOPERA’s General Assembly in Aarhus, establishing a solid foundation for finalising a clear and fair legal framework for upcoming procurements.

On the technical side, the team is working on a common specification. This is an umbrella document for high-level requirements plus a detailed specifications structure based on a system breakdown structure. We drafted an example section to lock down writing rules, assigned authors, and charters populated with requirements linked to InterOPERA results. This work will lead to a first full draft for review and refinement ahead of publication in early 2026.

Finally, the team set out key interoperability risks that arise when several vendors and owners work together, using lessons learnt from system design studies to address interoperability risks. They are drafting a coordination process to mitigate these risks in real projects. Stakeholders at InterOPERA's General Assembly endorsed the methodology, and the team now invites an active review of the proposed mitigations. This coordination process will define which interaction studies to run, when to run them, and how to act on the findings. The goal is to help future projects reduce risk early and tender with confidence.

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## Get in touch with us:

Want to learn more about InterOpera? Or have any questions about our work?

Get in touch at [info@interopera.eu](mailto:info@interopera.eu)

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