

InterOPERA Stakeholder Committee - 4th technical workshop Summary report

PUBLIC



ABOUT INTEROPERA:

The InterOPERA project will define technical frameworks and standards for electricity transmission and accelerate the integration of renewable energy. Ensuring that HVDC systems, HVDC transmission systems or HVDC components from different suppliers can work together – making them “interoperable”- is a top priority to accelerate Europe’s energy transition.



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Stakeholder committee report - 4th workshop

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AUTHORS:

Oliver Pohl, Amprion
Laurens Busschaert, Elia
Emanuele Marsella, Terna
Rene Lindeboom, Ørsted
Nina Mavrogeorgou, WindEurope

REVIEWERS:

InterOPERA Stakeholder Committee

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1.0	26.11.2025	Nina Mavrogeorgou	First draft
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Table of Contents

About the 4 th technical workshop	5
1. Risk assessment and procurement strategy (deliverable 5.1)	6
2. Legal basis for procurement procedure (task 5.2)	7
3. Multi-Party Cooperation Framework (Work Package 4)	8

About the 4th technical workshop

On 25 November 2025, the fourth in a series of InterOPERA technical workshops took place. This workshop focused on selected deliverables prepared by the experts of Work Package 4 and 5. Specifically, the following topics were discussed:

- i. Risk assessment and procurement strategy (deliverable 5.1)
- ii. Legal basis for procurement procedure (task 5.2)
- iii. Multi-Party Cooperation Framework

The workshop featured presentations from Elia, Terna and Orsted, along with around 12 professionals and experts from the Stakeholder Committee. The workshop was conducted in a 2.5-hour online session.

The general introduction of the workshop was provided by Amprion explaining the workshop's context and the topics to be discussed during the workshop. Questions and comments were raised both during the presentation and in the Q&A sessions following each individual topic. Given the nature of the topic (legal/procurement) interaction with participants was less active comparing to previous workshops.

Table 1 Agenda of the 4th workshop

AGENDA

14.00 – 14.10	Welcome & Introduction – <i>Nina Mavrogeorgou, WindEurope & Oliver Pohl, Amprion</i>
14.10 – 14.50	Discussion: Risk assessment and procurement strategy (deliverable 5.1) <i>Laurens Busschaert, Elia</i>
14.50 – 15.30	Discussion: Legal basis for procurement procedure (task 5.2) <i>Emanuele Marsella, Terna</i>
15.30 – 15.40	Break
15.40 – 16.20	Discussion: Multi-Party Cooperation Framework (Work Package 4) <i>Rene Lindeboom, Ørsted</i>
16.20 – 16.30	General questions & wrap-up <i>Oliver Pohl, Amprion</i>

1. Risk assessment and procurement strategy (deliverable 5.1)

The presentation opened by introducing a five-step methodology used to develop a comprehensive procurement strategy. This process involved defining main electrical components, establishing procurement lotting options, conducting market screenings with suppliers, performing risk assessments, and finally applying a Cost-Benefit Analysis (CBA) model.

Scope of the Reference Project

The presentation defined the essential functional building blocks for MTMV grids as the HVDC Converter Station and the DC Switching Station (DCSS). Notably, the presenters clarified that the DC Grid Controller is excluded from the lotting strategy because it is considered an "overlay" system that system owners will procure and manage directly as an inherent consequence of a multi-vendor HVDC system. To make their analysis concrete, they utilized a reference topology based on a phased project where two separate PtP connections are eventually linked by a central DCSS to create a four-station grid. This reference model assumed two different owners and a requirement that the full project scope be awarded within a single year.

Market analysis

The presentation continued with a focus on the findings from market screening for having the components commercially available. The presenters described the current HVDC market as a "seller's market" dominated by an oligopoly of three main suppliers. They shared the insight that while technology is maturing, full commercial availability for all MTMV components is not expected until the early to mid-2030s. Consequently, the first operational projects using this technology are projected for the late 2030s or early 2040s. The task leaders noted that original equipment manufacturers (OEMs) are particularly concerned about integrating components from different vendors at the DCSS, which will require TSOs to absorb a larger share of performance liability.

Evaluation of Procurement Options

The team presented three distinct lotting strategies for the reference project. Option 1 involves bundling, where each owner signs one large contract for their entire scope, such as a PtP system and the central DCSS. Option 2 suggests an unbundled approach where PtP systems and the DCSS are procured through three or four separate contracts to increase competition. Option 3 proposes a joint procurement model where both owners sign a single shared contract for the central switching station components.

Risk Mitigation and Final Recommendations

The presentation concluded with highlighting the 15 key risks identified for MTMV procurement. Emphasising that the single most critical mitigation measure is conducting a Front-End Engineering Design (FEED) study before awarding main contracts. This study is essential for defining vendor-neutral requirements and preventing costly late-stage technical changes. Even with a FEED study, high-impact risks remain regarding the lack of standardization and the complexity of system integration tests.

Based on the Cost-Benefit Analysis scoring against eight key indicators - including owner contingencies, CAPEX, and staffing requirements - Option 1 was presented as the favored strategy for initial projects. The presenters explained that because TSOs are risk-averse, they prioritize reducing interface complexity and construction risks over achieving the lowest possible CAPEX. They ended the session by stating that while bundling is best for early resource efficiency, multi-contracting will likely become more attractive in the long term as the market matures and integration risks decrease.

2. Legal basis for procurement procedure (task 5.2)

During the meeting, participants were reminded of the central importance of Task 5.2 within the overall structure of Work Package 5. Although InterOPERA is predominantly a technical project, the successful deployment of the first Multi-Vendor Multi-Terminal MVMT HVDC systems cannot rely on technical work alone. True interoperability requires an equally interoperable legal and procedural framework. For this reason, the meeting aimed to illustrate how the legal workstream has advanced in parallel with technical activities, contributing to a unified foundation for future real-life MVMT HVDC projects.

The first part of the presentation examined the progress achieved under Sub-Task 5.2.1. The work began with the decision to adopt the FIDIC Yellow Book 2017 as the reference structure. From that basis, a collaborative and inclusive process was carried out among InterOPERA partners to identify the most relevant contractual clauses for MVMT HVDC systems, particularly those touching upon interoperability, multi-vendor coordination, system integration, documentation requirements, intellectual property, testing obligations, liability allocation and interface management.

Once the longlist of clauses has been selected, it was rationalised to ensure that only the provisions truly critical for multi-terminal HVDC systems remained. These clauses were then distributed among various working groups that included both Employers and Vendors, with the aim of producing a balanced and coherent set of contractual texts. Each provision was subsequently revised to include interoperability-specific elements such as obligations regarding the provision and review of Rely Upon Information, participation in joint testing and commissioning panels, support for coordinated interface management, and the use of simulation models and interoperability documentation. A first consolidated draft was shared with stakeholders for comments, which are now being integrated into the final version.

Finally, concerning 5.2.1 it has been one more stressed the concept that the contractual provisions are not binding and so they are not intended to impose obligations but to provide guidance.

The meeting then moved to Sub-Task 5.2.2, dedicated to contractual risk management. When has been clarified that this analysis focused exclusively on risks that either remain after technical mitigation or cannot be mitigated except through contractual means.

Using the inputs provided by Task 5.1, three residual risks were analysed in detail: the complexity associated with system integration testing, the lack of standardisation for HVDC equipment and processes, and the potential impact of delays on one of the point-to-point (p-t-p) contracts. It has been noted that these risks are inherently linked to Multi-Vendor, Multi-Terminal systems, whose functioning

depends on coordinated design, shared models, compatible controls, and structured joint testing. Contractual measures such as deterrence mechanisms, interface-specific obligations, coordinated retesting procedures and clear assignment of responsibilities were therefore developed to limit both the probability of occurrence and the magnitude of impact of these risks. The analysis also reaffirmed that a Contractor's liability must remain strictly tied to its own scope, and that delays or failures attributable to the Employer, the Engineer, Other Contractors or Associated Works must lead to extensions of time or compensation where appropriate.

The third part of the presentation focused on Sub-Task 5.2.3, which addresses the alignment between the Multi-Party Cooperation Framework (MPCF) and the contractual clauses drafted under Sub-Task 5.2.1. Since the MPCF is still undergoing internal revision, this section has been limited to identifying the current areas of overlap. Several MPCF articles naturally intersect with the contractual instruments being developed—definitions, intellectual property, liability, dispute management—and these elements will be harmonised once the MPCF reaches its next stable version.

The session then progressed to Sub-Task 5.2.4, in which the procurement procedures applicable to MVMT HVDC projects were examined in accordance with EU Directive 2014/25. Through a joint voting process, six evaluation metrics had been selected and scored to each of the possible procedures: information sensitivity, cost reduction potential, openness, cooperation level, speed and flexibility.

The assessment showed that the Competitive Dialogue procedure is particularly well suited for the early stages of MVMT HVDC deployment, offering the right balance of flexibility, cooperation and structured interaction needed in projects where many parameters are not yet standardised. The Negotiated Procedure may serve as an effective intermediate step as the market matures, whereas Open or Restricted Procedures should be used only once technologies and requirements have reached a stable and widely accepted level of standardisation. The Innovation Partnership, while valuable at earlier research stages, is not expected to be the most appropriate tool for projects immediately following InterOPERA, since R&D have largely been completed under the project framework. This assessment led to the recommendation of a phased procurement strategy, beginning with Competitive Dialogue and evolving in parallel with technological maturity.

During the open discussion, stakeholders shared observations on the importance of maintaining a balanced allocation of obligations between Employers and Contractors, especially in relation to interoperability deliverables and interface documentation. Particularly has been asked on how the allocation of responsibilities and liabilities will be carried out in later stage of the project. An answer to this question is still not possible yet, but it has been told that the allocation strategy will depends on the completeness of the Technical Requirements and on the ability of the parties involved to bear such risks.

3. Multi-Party Cooperation Framework (Work Package 4)

As a pre-read and during the meeting the audience was introduced to the current version of the Multi-Party Collaboration Framework which has been published on the InterOpera website. The intention of the framework has been explained as well. It was shared that the project is in continuous progress,

where many learnings have been gathered over the course of the project and learnings have provided the insights to adapt the intention of such framework. As part of the update process for the MPCF a questionnaire was issued to the project’s participants, which was then repeated to the audience of this event with the intention to gather an external view on the purpose of such framework.

At first the original purpose of the MPCF was presented, where an emphasis was made on the intention that the framework should enable a cooperative process with the following functionality; Modularity and standard interfaces to ensure interoperability by design, The system integration to be de-risked and the overall system performance to be validated, this process requires sharing models and simulation data while carefully managing IP and preserving confidentiality.

The development process for the new version of the MPCF was presented as well. It was discussed which elements would play a role in the definition of the new version of the MPCF which are: the questionnaire with specific questions on the purpose, content and governance post InterOpera; the design of the pre-contract phase; governance of data and model sharing; and the development of a procurement quilt.

The last part of the presentation was interactive with some questions taken from the questionnaire that was sent out to project partners. The intention of this part of the presentation was to get an external view on the intention, content and governance of the MPCF. Although responses were limited the following responses were received:

Question	Response (majority vote only)
In my view the objective of the MPCF should be	Help facilitate the procurement process of the first multi-vendor projects, by acting as a starting point for discussion around cooperation between parties within the given project
To achieve this aim, the MPCF needs to be:	First a guideline, to be developed into a binding document after InterOPERA
Which elements should be included in the MPCF and which topics should be included in the contracts.	MPCF: Contractual topology, project specific models and pre-qualification/requirements, Contract: contractual conditions, performance specification, Scope of work documents
In the current MPCF, a secretariat is envisaged to 'host' the agreement, to keep the member list up to date (accession, termination), to facilitate amendment processes, to organise meetings etc. Which organisation should host the agreement?	ENTSO-e

Please note that only the responses having a majority vote have been included in the above overview and have served as guidance for the open discussion at the end of the session. Furthermore, it was mentioned that the answers that were received will be considered in the update of the MPCF going forward.