

# WindEurope feedback to ENTSO-E workstream proposal for the development of multi-vendor HVDC systems and other Power Electronics Interfaced Devices

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WindEurope welcomes ENTSO-E's invitation to provide feedback on its workstream proposal for the development of multi-vendor HVDC systems and other Power Electronics Interfaced Devices. This process allows open participation and consultation from all relevant parties and can indeed enable their consensus on a workstream to be proposed.

Please find here some comments linked to the respective parts of the proposal:

- General: The topic of **grid forming converter control** is much broader than HVDC interoperability. Although it is an important topic indeed, it **should not be addressed in this context**, since it requires the involvement of many more actors (non-synchronous generation such as Wind and Solar, FACTS devices etc.). Adding this topic into the scope would make the project unnecessarily more complex. There is no clear reason why the topic needs to be included here. From a specific HVDC perspective this topic has been addressed by CIGRE TF 77, with further work under way in a new CIGRE working group.
- Workstream 1.D: To secure interoperability, it is necessary to define **functional specifications** at the system boundaries of an HVDC converter station. This include both AC and DC side Point of Common Coupling, but also the interfaces for the Control and Protection systems. The interface definition in CLC/TS 50654 should be used as reference. One important input for functional specifications is the expected **system operation requirements** for multi-terminal (cross-border) HVDC systems and hybrid interconnectors. In this context, TSOs should urgently work on defining system operational guidelines and specifications for such systems. It should be recognized that as technology develops, this guideline is a moving target and should be updated regularly.
- Workstream 2: The topic of **grid forming converter control** is much broader than HVDC interoperability. Although it is an important topic indeed, it **should not be addressed in this context**, since it requires the involvement of many more actors (non-synchronous generation such as Wind and Solar, FACTS devices etc.). Adding this topic into the scope would make the project unnecessarily more complex. There is no clear reason why the topic needs to be included here. From a specific HVDC perspective this topic has been addressed by CIGRE TF 77, with further work under way in a new CIGRE working group.

- Workstream 4: Standardization of models, tools and design processes must be made on the ground of **open participation, consultation, and consensus** of all relevant parties. Unfortunately, the recently published ENTSO-E standardized control interface for HVDC SIL/HIL conformity tests does not satisfy these basic requirements for establishing an industry standard. The current consultation by ENTSO-E on multi-vendor HVDC systems is a step in the right direction.
- Workstream 5.A: The development of functional specification, based on work performed in earlier workstreams, should be done for **selected real multi-terminal projects**. Such specific industrial target leads to a broader scope of engineering activity to deliver a complete solution (productization). In addition, demonstration of **best practice** proven in the target environment (i.e. multi-vendor delivery of industrial project) should be a prerequisite **before formalizing a DC grid code**.