# Expert Group: Identification of Connection Requirements for Offshore Grids

- A status report of ongoing progress in Phase II

21.09.2022
*EG CROS chaired by ENTSO-E, under the Grid Connection European Stakeholders Committee*
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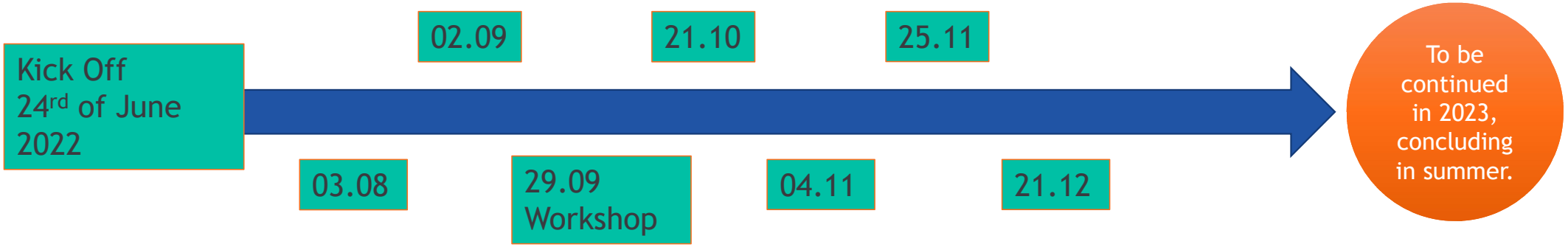
# Timeline of the EG CROS Phase II




**Some of the ongoing actions in the EG:**

- The formal ToR for phase II has submitted it to GC ESC.
- Prioritization by scoping on the current technologies and projects urging new requirements.
- Link the tasks with the specific articles in the network codes where they should be addressed.
- Sharing of information with CIGRE for potential synergies.
- Seeking involvement of storage associations (EASE), electrolysers manufacturers, T&D Europe…

# Observations of EG CROS - Phase II key discussion points (1/4)

- The EG has agreed to perform a scoping exercise in order to prioritize the work to the technologies and projects that are currently commissioned or planned for the short term

- Regarding the grid forming requirements needed for offshore applications, the EG has requested feedback from other groups as Cigre JWG B4/C4.93, and GC ESC EG ACPPM should be considered.

- Feedback on the requirements of grid forming from UK has been presented and discussed
  - For DC Connected PPM in UK, National Grid has specified requirements for grid forming converters.
  - The German connection network code has also similar requirements.

# Observations of EG CROS - Phase II key discussion points (2/4)

- **Topic under discussion**: Grid forming capability at the onshore HVDC converter station of offshore HVDC links
  - related articles for discussion:

    **NC HVDC**
    - Art. 14 (synthetic inertia)
    - Art. 12 (RoCoF withstand capability)
    - Art. 13 (active power controllability)
    - Art. 15 (LFSM –U/O)
    - Art. 18 (reactive and voltage control)
    - Art. 19 (Short circuit contribution during faults)
    - Art. 27 (fast recovery from DC faults)
    - Art. 52 (parameters and settings)

# Observations of EG CROS - Phase II key discussion points (3/4)

- **Topic under discussion:** Requirements for remote-end (offshore) HVDC converter station and DC connected PPM to provide voltage and frequency formation

**NC HVDC**

- Art. 2 – Definitions
- Art 46 (requirements for remote-end HVDC converters station)
- Art 18 (reactive power and voltage requirements)
- Art. 12 (RoCoF withstand capability)
- Art. 39 (frequency stability requirements)
- Art. 40 (reactive power and voltage requirements)
- Art. 47 (frequency stability requirements)
- Art. 48 (reactive power and voltage requirements)
- Art. 51(information exchange and coordination)
- Art. 68 (compliance simumlation)
- Art. 72 (compliance simulations and testing for DC PPMs)
- Coordination of the offshore and onshore converter station

# Observations of EG CROS - Phase II key discussion points (4/4)

- **Other topics under discussion:**
  - Requirements for DC connected electrical storage modules to provide voltage and frequency formation
  - Technical minimum requirements for AC interconnectors between HVDC interface points
  - Technical minimum requirements for DC connected Demand Facilities and DC connected ESM in a shared/common HVDC interface point
  - Applicability of the NC HVDC articles on the topologies defined in the report. The assessment should be done for both the case that the states are in the same as well as in different synchronous areas.
  - Moreover, the EG should define the minimum technical capabilities of such interconnectors, connecting offshore HVDC interface points (regardless if the onshore HVDC converter stations are at different synchronous areas).