

TOP 3. ENTSO-E Updates

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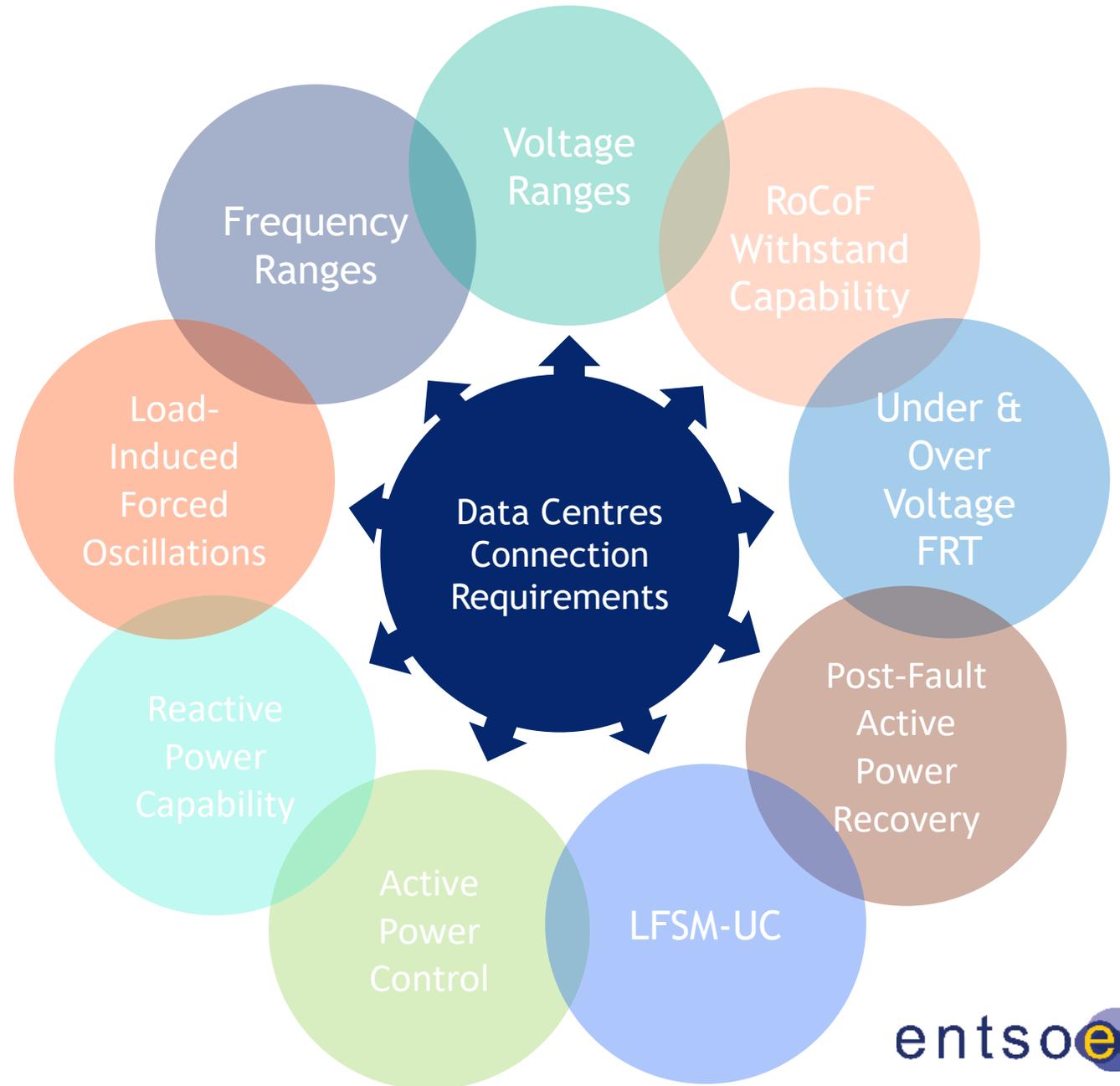
ENTSO-E Position Paper Presentation

ENTSO-E Position Paper on CNC 2.0 Implementation

- Given the deprioritization of the entry into force of the CNC 2.0, ENTSO-E published a position paper in December 2025 ([link](#)) **recommending TSOs to take actions to initiate the update of the national technical connection requirements** as soon as possible to ensure EU-wide power system stability needs
- ENTSO-E recommends to conduct this process **based on ACER's draft proposals** shared to the EC and the common results of ACER's informal **workstreams**
- These actions aim at addressing the gap of lack of **adequate requirements** to meet the system needs as well as at ensuring a certain level of **harmonization** in Europe until the CNC 2.0 are adopted
- Furthermore, it also includes an **annex with recommended basic connection requirements for data centres** given that no specific provisions are included in the draft NC DC 2.0

Recommended Data Centres Connection Requirements

- The recommended minimum set of harmonized technical requirements are **based on the power-to-gas** demand units requirements included in the draft NC DC 2.0 (Article XX)
- In addition, a **load-induced forced oscillations** requirement is included given the particular load behaviour of data centres
- These basic connection requirements will be the **base for the ACER informal** **workstream discussions**



1st Wave of Implementation Guidance Documents (IGDs)

Feedback on stakeholders' requests

ENTSO-E acknowledges the stakeholders' suggestion and will organize **one workshop for each of the 4 IGDs** of the 1st wave prior to the public consultation aiming at presenting their content and collecting preliminary feedback

The scope of these IGDs includes the following **draft NC RfG 2.0 articles**

Grid-forming

- **Type A PPMs:** Y(5-7)
- **Type B PPMs:** Y(5-7) & 20(4-5)
- **Type C PPMs:** Y(5-7) & 21(4-5)
- **Type D PPMs:** Y(6-7), 20(5) and 21(5)
- **Test and compliance:** 42(2)(b), 43(2)(b) & 43a

Forced Oscillations

- **Onshore type C-D PPMs:** 21(3)
- **AC-connected offshore type C-D PPMs:** 26(2)

Limited Frequency Sensitive Mode

- **LFSM-O:**
 - 13(3) for all PGMs
- **LFSM-U:**
 - 13(11) type A-B ESMs
 - 15(2)(c) type C-D PGMs

Certification

New/amended legal text:

- **Art. 2:** Some new definitions
- **Art. 40(6):** Provision Art. 12
- **Art. 43a:** Common Provision on Equipment Certificates

Detected Legal Wording Inconsistencies (non-exhaustive list)

NC RfG 2.0: Art. 21(3) on Forced Oscillations

Article 21(3) defines forced oscillations requirements for type C onshore PPMs, which also apply for type D, as follows:

- *The forced oscillations shall **not exceed continuously the maximum of** (default values):*
 - *0.5% of the maximum capacity*
 - *500 kW*
- *In case that these limits are **temporarily** exceeded, forced oscillations shall **not exceed** a limit of (default value): 2.5% of the maximum capacity*

Example of inconsistency: Case of a PPM with 5 MW of maximum capacity (0.5% = 25 kW; 2.5% = 125 kW):

- The forced oscillations shall not exceed continuously the maximum of (default values): 25 kW and 500 kW
→ 500 kW
- In case that these limits are temporarily exceeded, forced oscillations shall not exceed a limit of (default value): 125 kW

NC DC 2.0: Suggestion to split Article XX

- Article XX defines specific provisions for **V1G EVs** and associated supply equipment, **power-to-gas** demand units and **heat-pumps**
- Besides, this article may also include specific provisions for **data centres** demand units
- Given that the same requirements do not apply to all technologies, ENTSO-E's recommendation is to **split Article XX into several articles**: one per demand unit type
- This has already been suggested **in ACER's workstreams on P2G and data centres**, where the Article XX requirements for the specific demand unit have been extracted

NC DC 2.0: Transmission-connected units vs Article XX

- **Art. 12 and 13** define the general frequency and voltage requirements (respectively) for transmission-connected units
- **Art. XX(1)** defines the frequency and voltage ranges requirements for V1G EVs, P2G demand units and heat-pumps
- An inconsistency appears for the case, as an example, of a P2G demand unit connected at the transmission network → **Which articles should have priority?** Art. 12 & 13 or Art. XX(1)?

Frequency and time ranges according to Art. XX(1)

Frequency range	Time period for operation
47,5 Hz-48,5 Hz	30 minutes
48,5 Hz-49,0 Hz	30 minutes
49,0 Hz-51,0 Hz	Unlimited
51,0 Hz-51,5 Hz	30 minutes
51,5 Hz-52,5 Hz	10 seconds

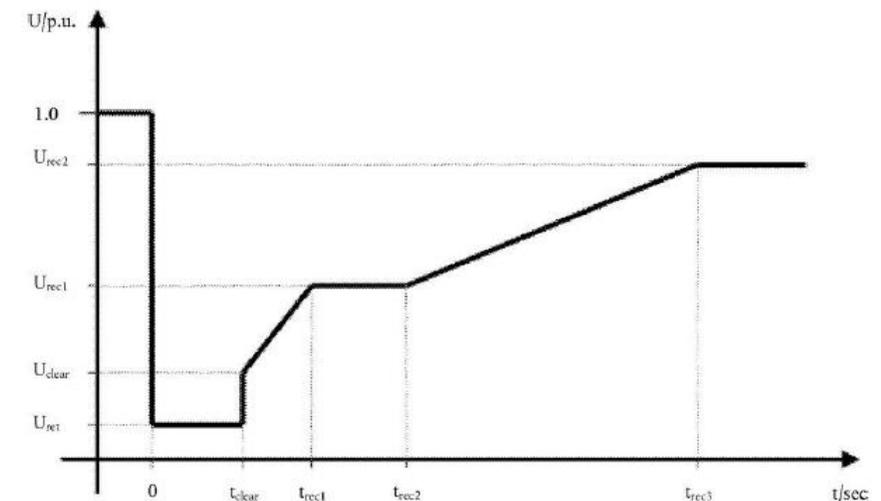
Frequency and time ranges according to Art. 12 for Ireland

Ireland and Northern Ireland	Frequency range	Time period for operation
	47,5 Hz-48,5 Hz	90 minutes
	48,5 Hz-49,0 Hz	To be specified by each TSO, but not less than 90 minutes
	49,0 Hz-51,0 Hz	Unlimited
	51,0 Hz-51,5 Hz	90 minutes
	51,5 Hz-52,5 Hz	10 seconds

NC DC 2.0: Voltage ranges

- Besides, Art. XX(1) is **not in line with Art. 13(12) of draft NC RfG 2.0**, where voltages below 110 kV are considered
 - Art. XX(1) is as follows:** (b) be capable of remaining connected to the network and operate continuously within the range of **0,85 pu - 1,1 pu** at the connection point. Beyond these voltage range values, the under-voltage ride through immunity limits apply.
 - Art. 13(12) of draft NC RfG 2.0 is as follows:** ... shall be capable of remaining connected to the network and operate continuously within the range of **0,85 pu - 1,1 pu** at the connection point should that be **at or below 1000V**. Conversely, the power-generating module shall be capable of remaining connected to the network and operate continuously within the range of **0,9 pu - 1,1 pu** at the connection point should that be **above 1000V and below 110 kV**.
- Consequently, **Urec2 in the fault-ride-through** curve of draft NC DC 2.0 should also be adapted, which is currently 0.85 pu
- Consequently, the **post-fault recovery** of draft NC DC 2.0 should also be adapted. Currently:

When the network voltage resumes, after the fault has been cleared, to a value within the voltage range of 0,85 pu – 1,1 pu...



NC DC 2.0: Fault-Ride-Through capability for asymmetrical faults

- Art. XX(6) defines the **fault-ride-through capability of power-to-gas demand units**
- For asymmetrical faults (paragraph (c)): *Fault-ride-through capabilities in case of asymmetrical faults shall be specified by the relevant system operator.*
- Instead, NC RfG defines it as follows: *Fault-ride-through capabilities in case of asymmetrical faults shall be specified by ~~the relevant system operator~~ relevant TSO.*