ENTSO-E views on electromobility, power-to-gas demand units and heat-pumps in the amendments of the Connection Network Codes

17 April 2023, presented by Mario Ndreko and Adrian Gonzalez

entsoe

Reliable Sustainable Connected

On ACER’s proposal for RfG NC

On generalities for smaller units

- ✓ ENTSO-E supports the technical requirements and the approach of having fully harmonised requirements for all installations of a size lower than A-B threshold. This is in line with ACER's proposal for EV1 and ENTSO-E proposal for type A harmonisation.

- ✓ ENTSO-E acknowledges that EV1 (main application being onboard charger) shall not require connection agreement and therefore shall not fall into the approach of categories (& types) as defined in Article 5.

- ✓ ENTSO-E supports the approach of requiring a connection agreement for charging power above 2.4kW.

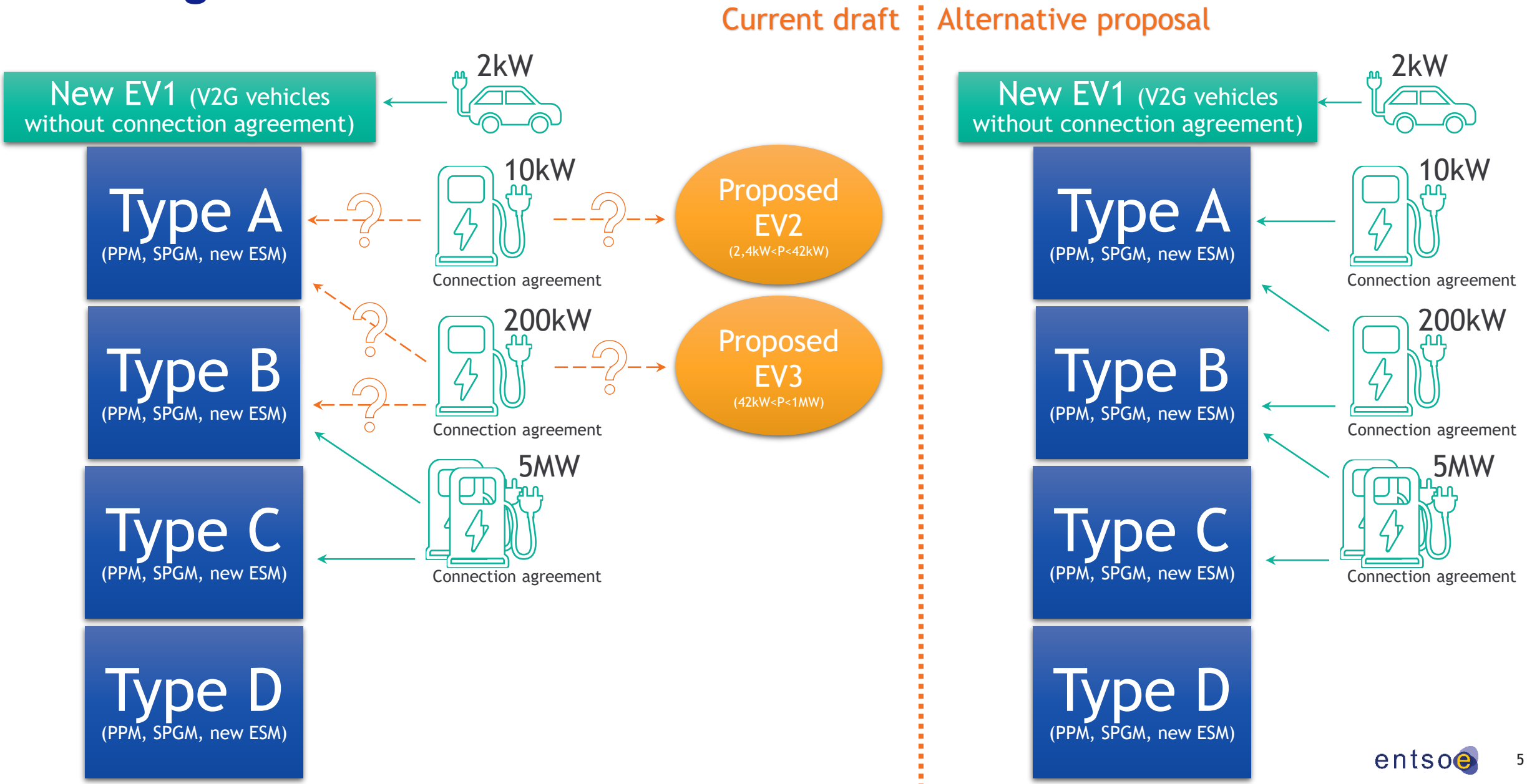
On categorization

- Once a connection agreement is defined, the **NC RfG approach of Article 5** and categorization build upon the definitions of ESM ("…'ESM' means a power generating module…") , SPGM, PPM ("…unit or ensemble of units … has a single connection point"…) and Pmax **shall also apply to electric vehicles**. ENTSO-E therefore sees a **risk in having two different requirement packages in the RfG** (one for EV2, EV3 and another for Type A, B, C…) applying to an EV. This implies **risk of legal ambiguity**.

- **The basis of categorization (Article 5) is very important** to avoid that connection requests from one grid user at a single connection point is split into smaller installations to elude the requirements of a higher category (e.g. a wind farm split into 2 smaller wind farms to fall under a threshold). This approach should not only apply for PV, Wind, battery systems but also for EV2 and EV3 charging stations (e.g. a set of 25 EV3s charging stations of 1MW connected at the same connection point should be considered as one ESM/PPM of total 25MW related to the category at the national level, type C or D).

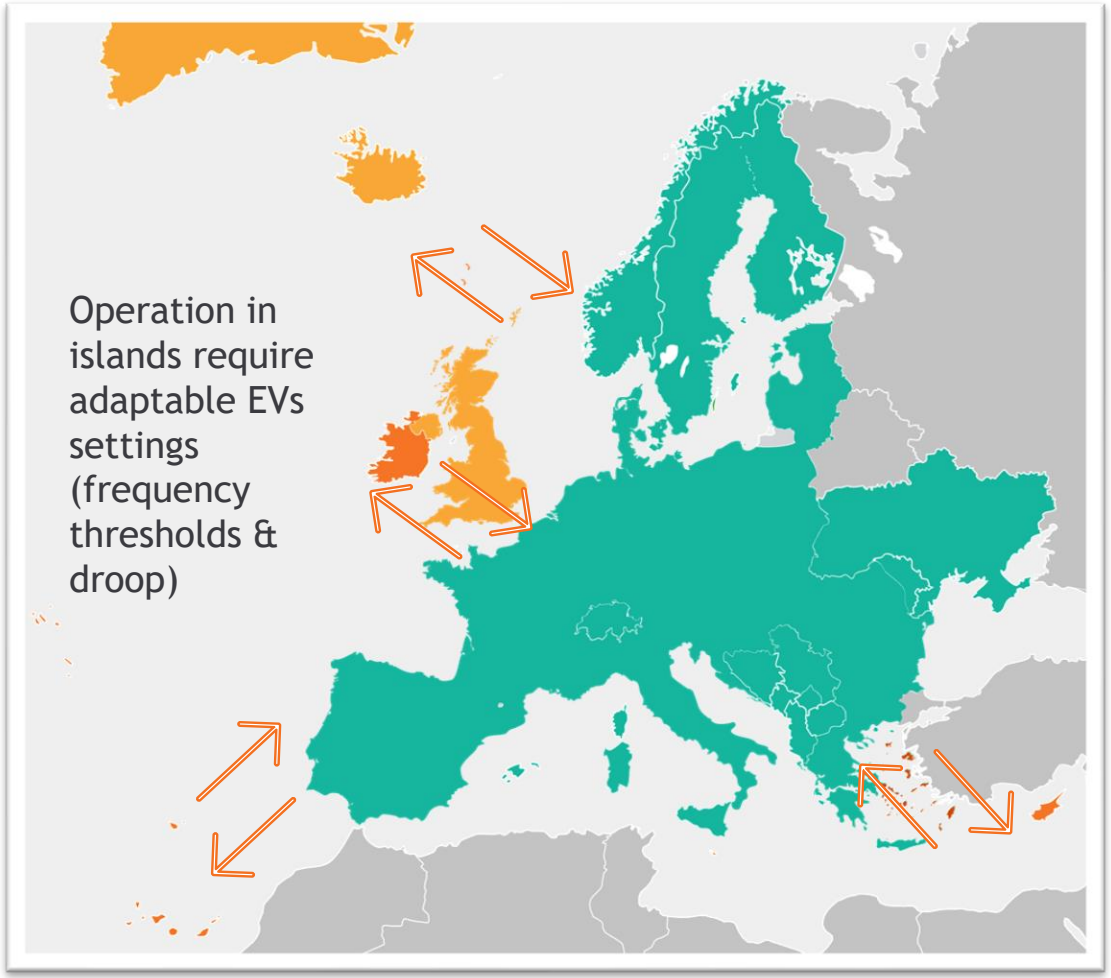
- Proposal: **As a connection agreement is required for EV2 and EV3, these should fulfil requirements according to the applicable category of Article 5**. Considering ENTSO-E's proposal on exhaustive and harmonized on synchronous area level requirements for type A, it will not impact the technical requirements as they are proposed/drafted by ACER.

On categorization



On parameters of frequency threshold and droop

- ✓ ENTSO-E supports the selection of one exhaustive value of droop for EV1 for the synchronous area. However, **ENTSO-E is performing simulations to determine which droop should be adopted according to future system scenarios**. The outcome of this analysis will be shared with ACER and stakeholders in the next months.
  - ➢ Nevertheless, ENTSO-E considers that a range of droop settings, with a default value that can be changed, eventually through OTA updates to the EV, is the preferred and best future-proof option, also considering the EVs impact in isolated systems.
- ➢ For EV2 and EV3, having the capability to adapt the droop within a range with a default setting, is identical to the requirement proposed for ESM and therefore in line with the mentioned proposal.



On ACER’s proposal for DC NC

On unidirectional charging electric vehicles (V1G)

ENTSO-E supports ACER's proposal. V1G EVs will become significant in the system and their requirements must be harmonized across Europe considering its mobility.

Should be improved:

- Fault-Ride-Through capability must be required to these grid users to contribute to system robustness.
- Simulations on the droop value proposed are being carried on
- Flexibility for changing parameters, such as droop or frequency threshold for power reduction, should be foreseen: Future system needs and particularities of isolated systems can benefit from OTA updates in EVs.

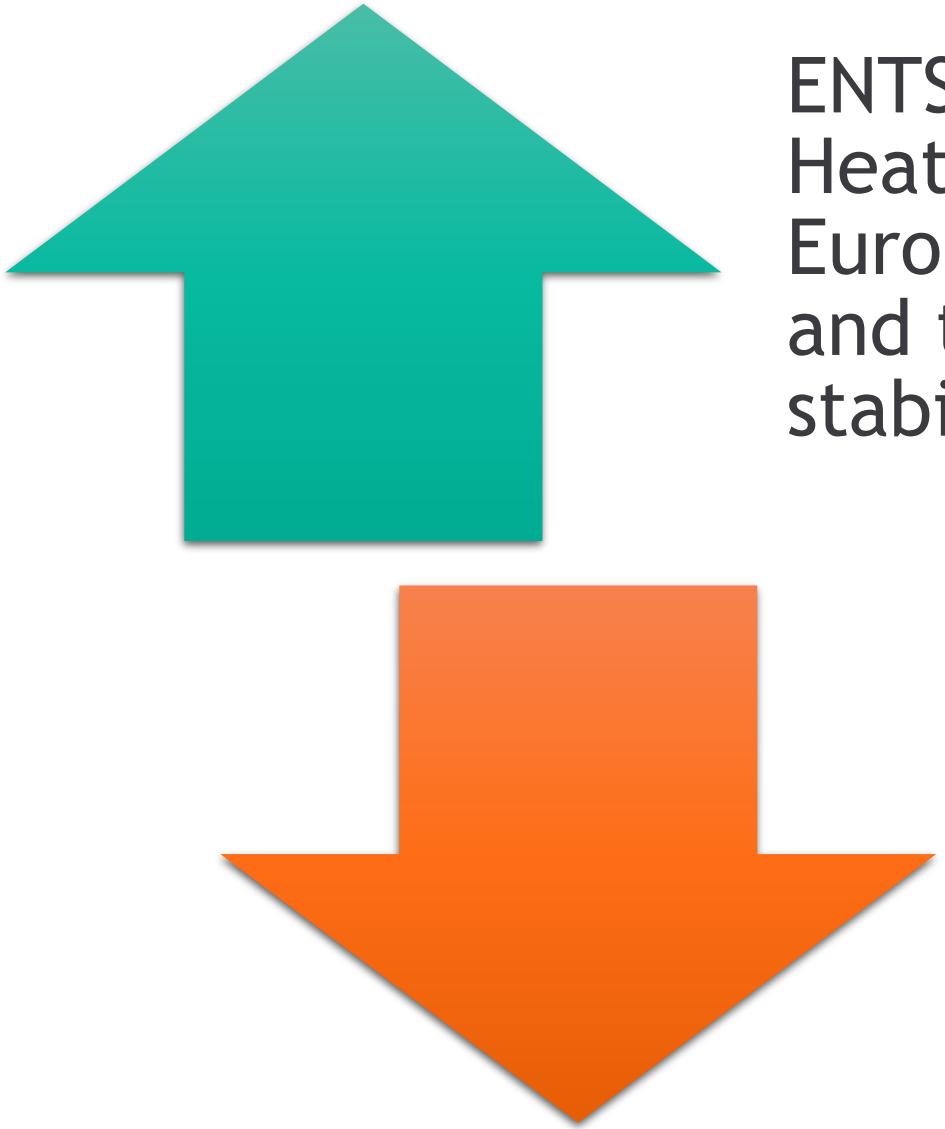
On power to gas demand units

ENTSO-E supports ACER's proposal. Power to gas demand units will become significant in the system and their requirements would benefit from harmonization.

Should be improved:

- Fault-Ride-Through capability must be required to these grid users to contribute to system robustness.

On heat pumps



ENTSO-E welcomes ACER's proposal. Heat pumps are a growing share of Europe's electricity consumption and their contribution to the system stability would be beneficial.

The scope should be extended:

- Not only heat pumps but any temperature-controlled device above 800W should be addressed. The heat pumps proposal's rationale and the negligible impact in the thermal performance are also applicable to these devices.
- This extension would strongly support future system needs at an optimal cost (CBA available)
- Fault-Ride-Through capability must be required to these grid users to contribute to system robustness.

Thank you very much for your attention

Our values define who we are, what we stand for and how we behave.
We all play a part in bringing them to life.

EXCELLENCE

We deliver to the highest standardss. We provide an environment in which people can develop to their full potential.

TRUST

We trust each other, we are transparent and we empower people. We respect diversity.

INTEGRITY

We act in the interest of ENTSO-E

TEAM

We care about people. We work transversal and we support each other. We celebrate success.

FUTURE THINKING

We are a learning organisation. We explore new paths and solutions.

We are ENTSO-E