

# Report from the Expert Group 'Mixed Customer Sites with generation, demand and storage and definition of system users' (EG MCS) - **phase 2**

Robert Wilson, Chair of EG MCS

16<sup>th</sup> Grid Connection European Stakeholder  
Committee Meeting

12 December 2019, Brussels

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# EG MCS structure



Expert group: Mixed customer sites with generation, demand and storage, and definition of system users (EG MCS)

Approved by the GC ESC on [September 14, 2018](#)  
Subject to possible updates on the list of members

Revised version including phase 2 work was approved  
by GC ESC on December 12, 2019

Chair: ENTSO-E, Robert Wilson

Vice-Chair: Paul de Wit, CEDEC on behalf of DSO Associations

## Problem Statement

On 11 June 2018, the Grid Connection European Stakeholder Committee (GC ESC) decided to establish an Expert Group (EG) to clarify the requirements on mixed customer sites (MCS), where these could be a combination of generation, demand and/or storage facilities. The creation of this EG was proposed by ENTSO-E to elaborate on connection network code (CNC) issues which had been raised by stakeholders during CNC implementation. The ENTSO-E proposal was based on the findings of a stakeholder survey to identify priority topics.

Part 2 of this work, as approved by the GC ESC on 11 Sept 2019, is aimed to finalise the proposals and determine text that could be used in a future revision of the Requirements for Generators code.

## Target (objectives)

### Phase 1 – October 2018 to June 2019

The objectives of the EG MCS are:

- to provide clarification regarding the application of the Network Code on Requirements for Generators (NC RfG) Demand Connection Code (NC DC) and HVDC (NC HVDC) to MCS with generation, demand and storage (to the extent that storage might in future be classed as separate from generation or demand);
- identify differences and similarities of mixed customer sites which are CDSOs and non-CDSOs;
- in the context of MCS:
  - assess types of MCSs to be considered;
  - to assess the MCS case against the current definition of system users, found in the Directive 2009/72/EC;
  - to review the definitions of Synchronous Power Generating Module (SPGM)/Power Park Module (PPM); and
  - to provide clarification in terms of the type A-D categorisation or applicability of RfG for mixed or novel sites addressing cases such as:
    - mixed generation only sites where a small PGM (e.g. PV) is installed within the connection site of a larger generator;
    - small PGMs connected to a  $\geq 110\text{kV}$  network due to unavailability of lower voltage connection points
    - combined heat and power generating facilities connected at  $\geq 110\text{kV}$  (where type A-C would be excluded from certain RfG requirements)

Chair: ENTSO-E, Emilie Milin (Antony Johnson in Jan. 2020)

Vice-Chair: EASE, Noce Christian

## Public space

**EG MCS**

Mixed customer sites with generation, demand and storage, and definition of system users.

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**Annex**

- EG MSC Reporting 14th GC ESC
- EG MSC Reporting 13th GC ESC
- EG MSC Reporting 12th GC ESC

## Internal EG space

EG MCS

+ new document or drag files here

All Documents ... Find a file

Name	Modified
archive (non-exhaustive)	1 October, 2018
Examples and Additional references	13 November, 2018
Final report	31 December, 2018
Kick-off meeting_181019	11 October, 2018
meeting_190319_Brussels	10 March
meeting_191120	19 November
RfG classification	13 November, 2018
Specific equipment types_combinations	13 November, 2018
ToR and Annex	17 December, 2018
webinar_181119	13 November, 2018
webinar_181217	14 December, 2018
webinar_190121	18 January
webinar_190221	19 February
webinar_191031	31 October
webinar_191206	2 December

The ToR/Annex has been updated to include Phase 2 activities

# EG MCS meetings – phase 2



- October 31 (webinar)
- November 20 meeting
- December 6 (webinar)
- Jan (TBC) – webinar
- Feb (TBC)
- Mar (TBC) - webinar
- June 2020 GC ESC – report back



- 25 listed members for phase 2
- 14 different representative organizations
- ~50% participation of members
- >80% participation of organizations



- Continued good collaboration among the members, with useful discussions and presentations
- Good input in accordance with agreed actions
- Common space (SharePoint) and emails are used to provide inputs – recommendation to use SharePoint as much as possible
- Workplan continues as agreed to meet timeline

# Examples of 'Mixed Customer Site' issues

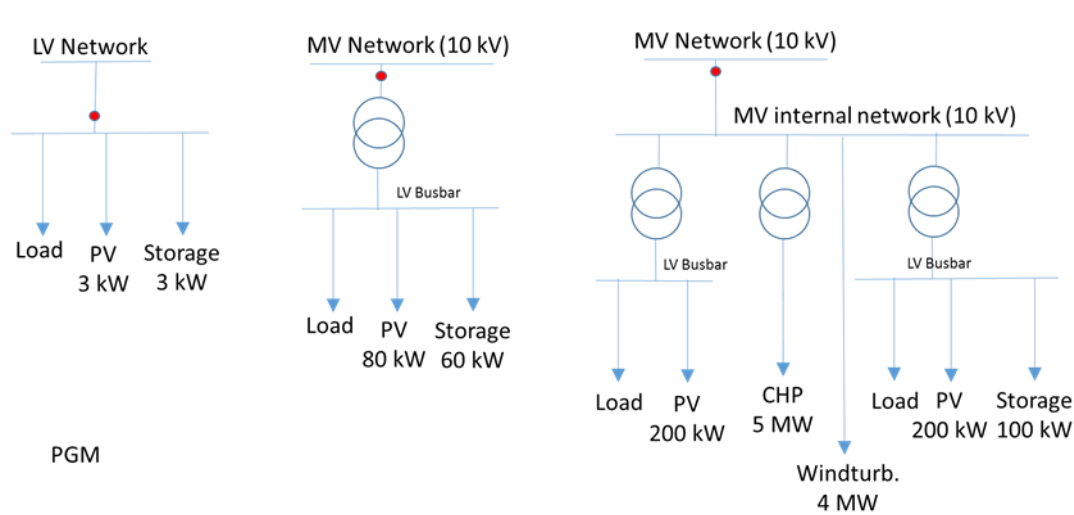
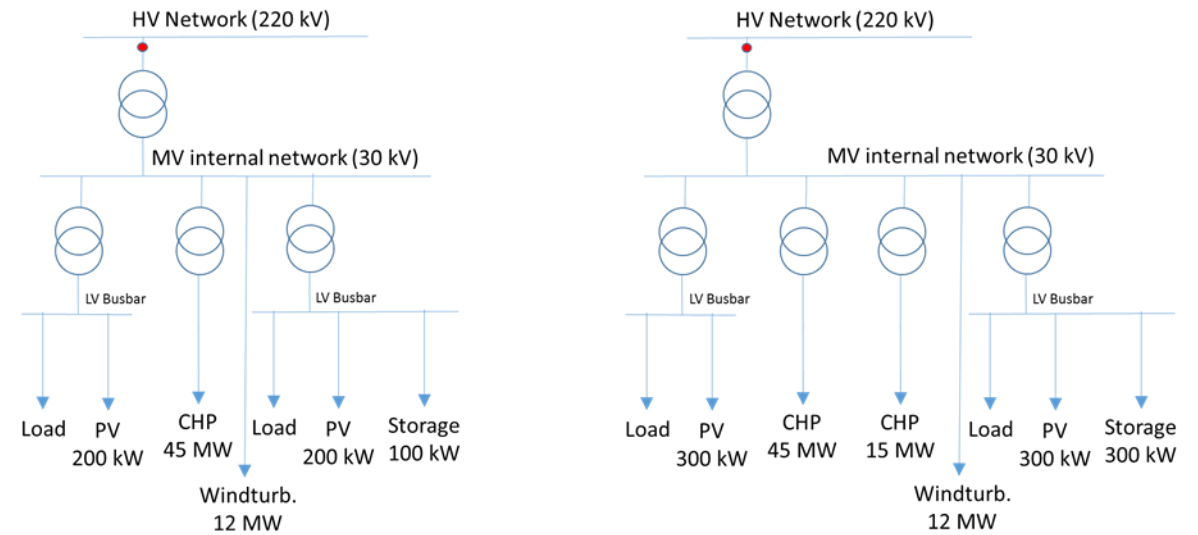


Fig 1(a) & (b) & (c) Mixed site connections to LV and MV networks .

Each of these generators is assessed as type A-D on the basis of their size



Figs 2 (a) & (b) Mixed sites connecting to HV networks via internal (= private) MV

Each of these generators is assessed as type D since their connection point to the system is at > 110kV

• Connection point at the network of DSO or CDSO

# Possible solutions from EG phase 1

- Acknowledgement that RfG 'type D' voltage default was not perfect but during the drafting of RfG had been the best option available.
- In line with the ACER [FWGL](#) to take account of the connection voltage - on page 8:  
*'The minimum standards and requirements shall be defined for each type of significant grid user and shall take into account the voltage level at the grid user's connection point.'*

## Options considered:

- Define additional 'interface point' to determine all connection requirements (except fault ride through); or
- Define additional 'interface point' just to determine the connection voltage and therefore type
- Increase voltage criteria to be >220kV; or
- Remove voltage criteria from type A generators (so determined by capacity only); or
- Remove voltage criteria from type A & B generators; or
- Remove voltage criteria completely so for all of types A-B-C; or
- Removal of voltage criteria from type A, partial removal of increased RfG requirements for type B generators (on capacity) where defaulted up to type D on connection voltage

\* Preferred by group

# ACER Instructions for Phase 2

Specific ACER requests for the Mixed Customer Sites group are to deliver:

- a) a more detailed assessment of the policy options (including economic metrics);
- b) a proposed wording for network codes; and
- c) the agreement and determination of a single policy option.

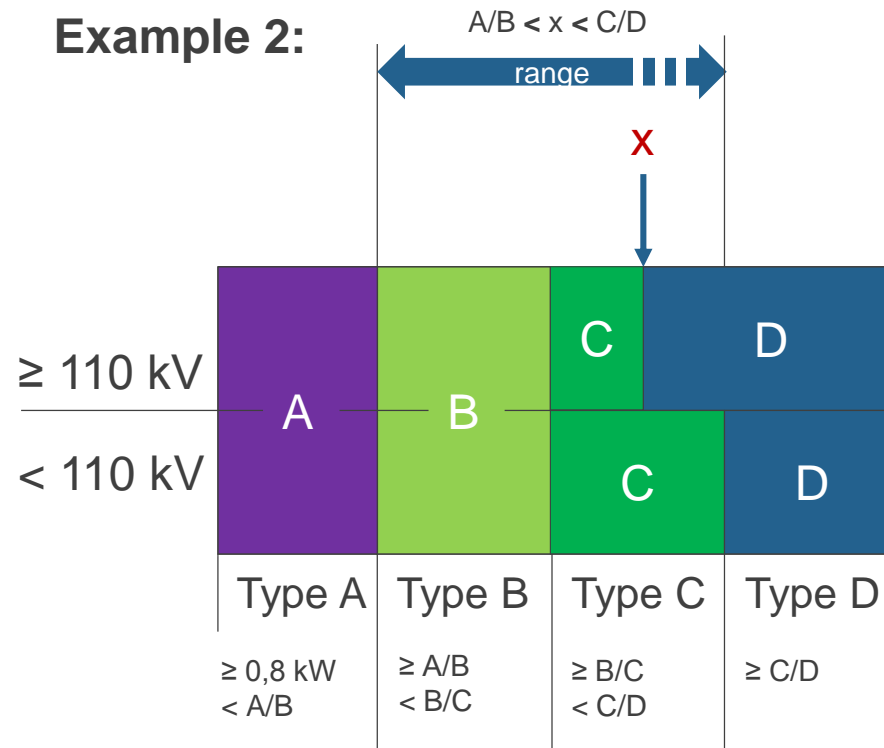
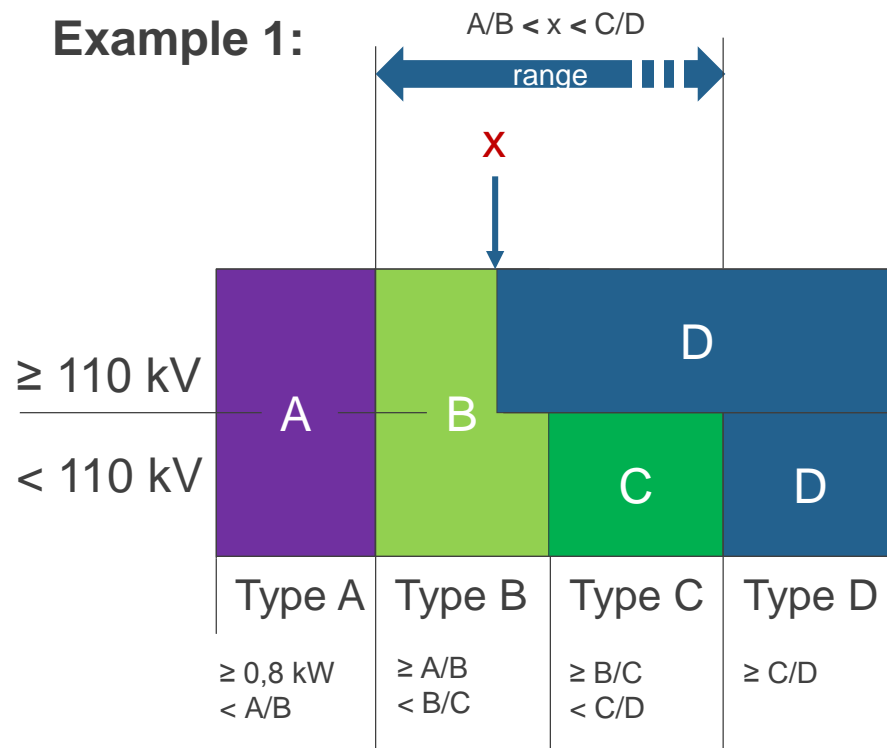
Should the expert group fail to agree on the preferred policy option, the proposed wording needs to be developed for all but do-nothing policy option.

## Phase 2 Work in Progress – Option Viability

Option	Consider Applying to all	Consider Applying only to MCS
Remove voltage criteria completely	No – ruled out	No - ruled out
Remove from A & B, national choice to remove from C	No - potentially same as total removal	No
Remove from A, national choice to remove from B	Possible	No
Interface point	No [but will be pressure to extend to all PGMs]	[complex change with wide impacts, only consider if all other options exhausted]
Remove voltage criteria from threshold (either set exhaustively or left to TSOs)	Possible	No
Remove from A & B, try to mitigate impact	No (but ask TSOs)	No
Do nothing	Only if all other options exhausted	N/A

# Additional Option – Removal of Voltage Criteria from a Threshold (x)

*“x shall be specified in the range  $A/B < x < C/D$  by each relevant TSO”*

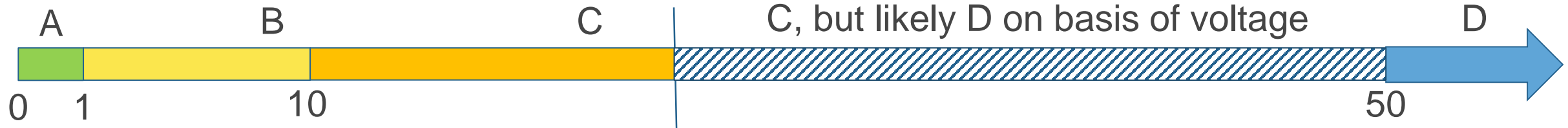




# What is the possible impact? (eg GB)

Existing RfG thresholds:

*Likely 110kV connection above this size; assumed about 20MW, but depends on geography*



Remove voltage criteria entirely:

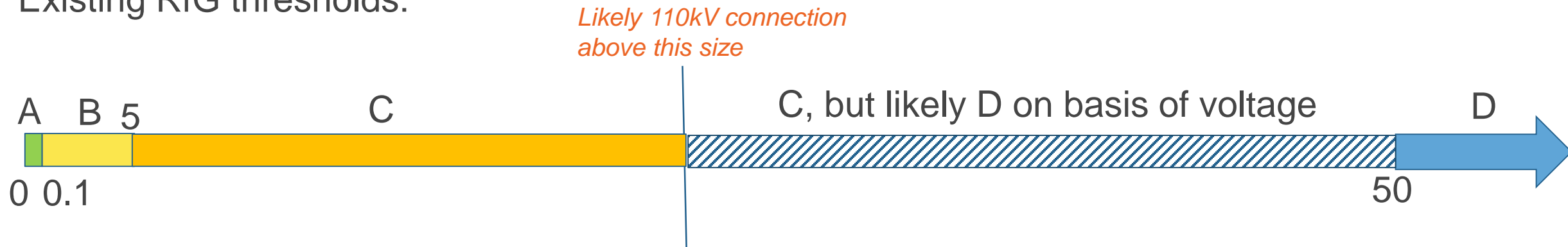


In GB, if the voltage criteria was removed entirely then, based on the projections used during the work to set the GB thresholds:

- Roughly 2.9GW of generation connecting in the future at 132kV would change from type D to type C, 30MW would become type B.
- This seems low but is not that surprising...given that the threshold in GB for connection at 132kV seems to be about 20-30MW. Only small numbers of generation projects are in the size range 30-50MW which will therefore connect at 132kV and be impacted by a removal of the voltage criteria.

# What is the possible impact? (eg Spain)

Existing RfG thresholds:



Remove voltage criteria entirely:



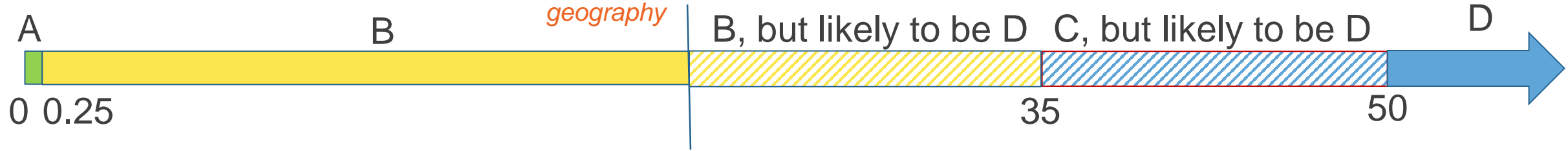
In Spain, if the voltage criteria was removed entirely then for generators connecting to the transmission system (i.e. from 220 kV to 400 kV) then:

- Generators already in service: 16GW would become Type C instead of Type D. 48 MW would become Type B.
- Generators not in service but that have access permission: 35.5 GW would become Type C. 90 MW would become Type B.

# What is the possible impact? (eg Austria)

Existing RfG thresholds:

*Likely 110kV connection above this size; up to 35MW due to geography*



Remove voltage criteria entirely:



Remove voltage criteria from type B:



If the voltage criteria was removed completely, following replanting then of all type D generation (35 TWh) in Austria 45% would move to Type B and 10% would move to Type C. This equates to, of 15.2GW installed type D, 3.7GW would become Type B and 1,4 GW would be type C.