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

16th Grid Connection European Stakeholder Committee Meeting

19 March 2020

EG MCS structure

ACER Agency for the Cooperation of Energy Regulators

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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

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.

Target (objectives)

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 ≥110kV network due to unavailability of lower voltage connection points
    - combined heat and power generating facilities connected at ≥110kV (where type A-C would be excluded from certain RfG requirements)
    - clarification on arrangements for point of connection to TSO, DSO or CDSO if that will determine the voltage of connection and therefore 'type' *(point added after the*

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ToRs updated to include phase 2 activities

[Public space]():

EG MCS

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

Annex

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

- archive (non-exhaustive)
- Examples and Additional references
- Final report
- Kick-off meeting_181019
- meeting_190319_Brussels
- RfG classification
- Specific equipment types_combinations
- ToR and Annex
- webinar_181119
- webinar_181217
- webinar_190121
- webinar_190221
- 180914_GC ESC_EG MCS_notes from preparatory call
- EG MCS reporting_12th GC ESC
- EG MCS_contact list
- READ ME

EG MCS meetings – phase 2

- October 31 – 13:30 – 16:30 (webinar)
- November 20 – full day meeting in Brussels
- December 6 –13:00 – 16:00 (webinar)
- January 29 – 13:00 – 16:00 (webinar)
- February 24 – 13:00–16:00 (webinar)
- March 20 – 10:00-13:30 (webinar)
- April- webinar TBC
- June 2020 GC ESC – report back

- 25 listed members for phase 2
- 16 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
- Workplan continues as agreed to meet timeline

Examples of ‘Mixed Customer Site’ issues

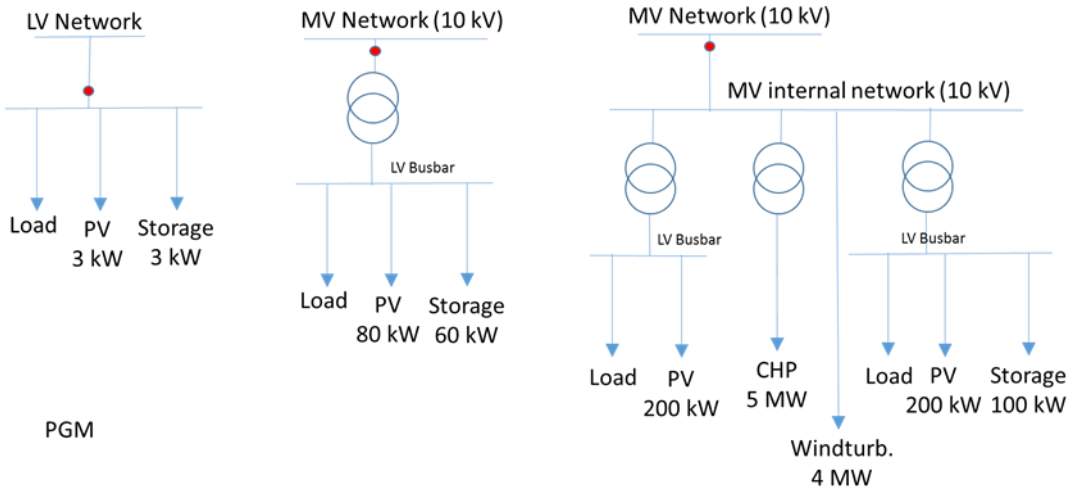
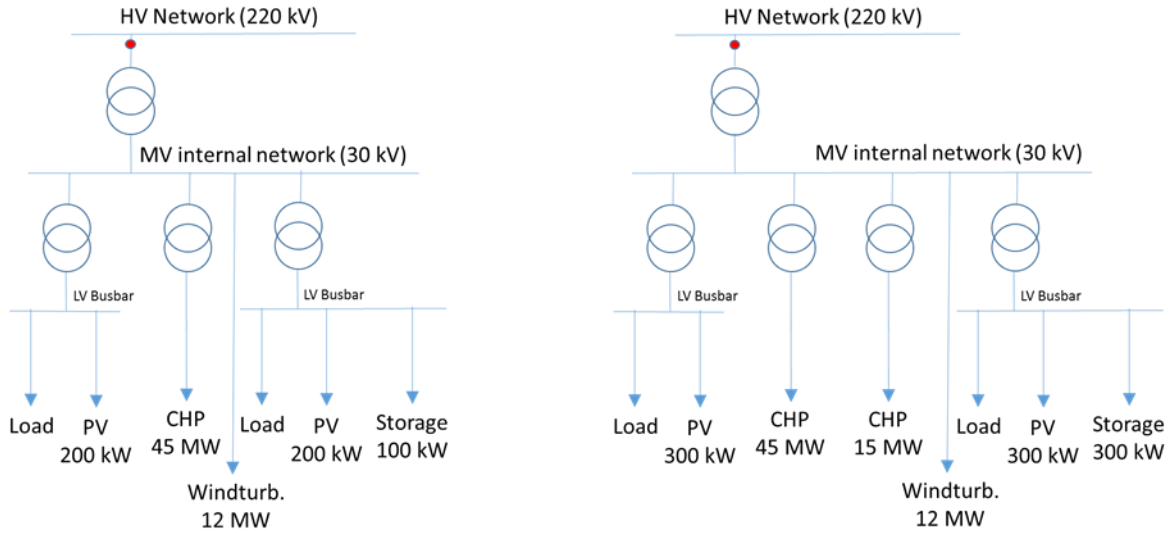


Fig 1(a) & (b) & (c) Mixed site connections to LV and MV networks .

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

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.

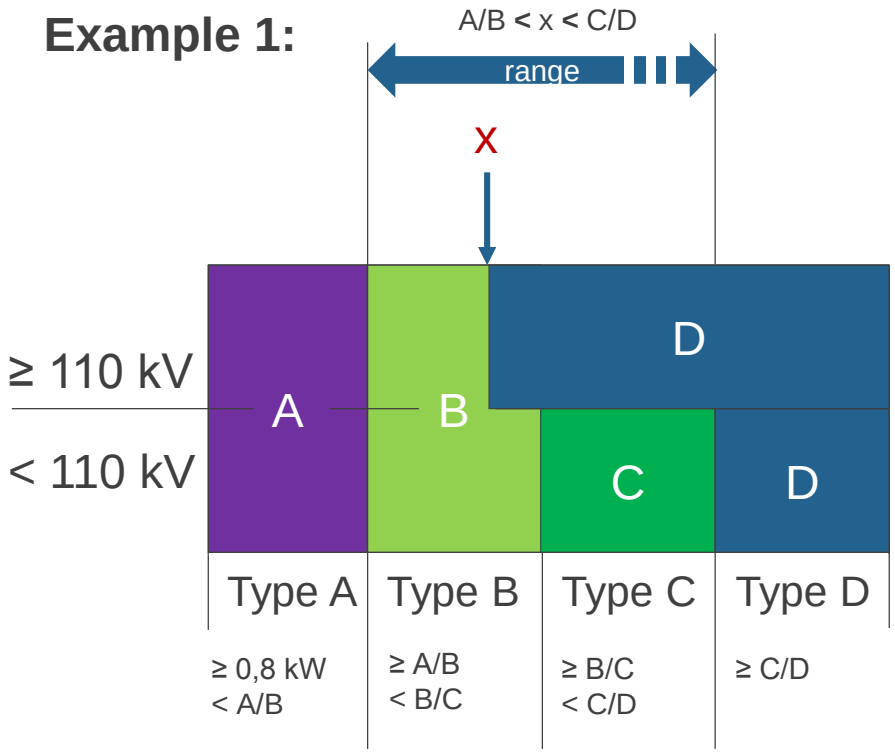
Phase 2 Work building on phase 1 options

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

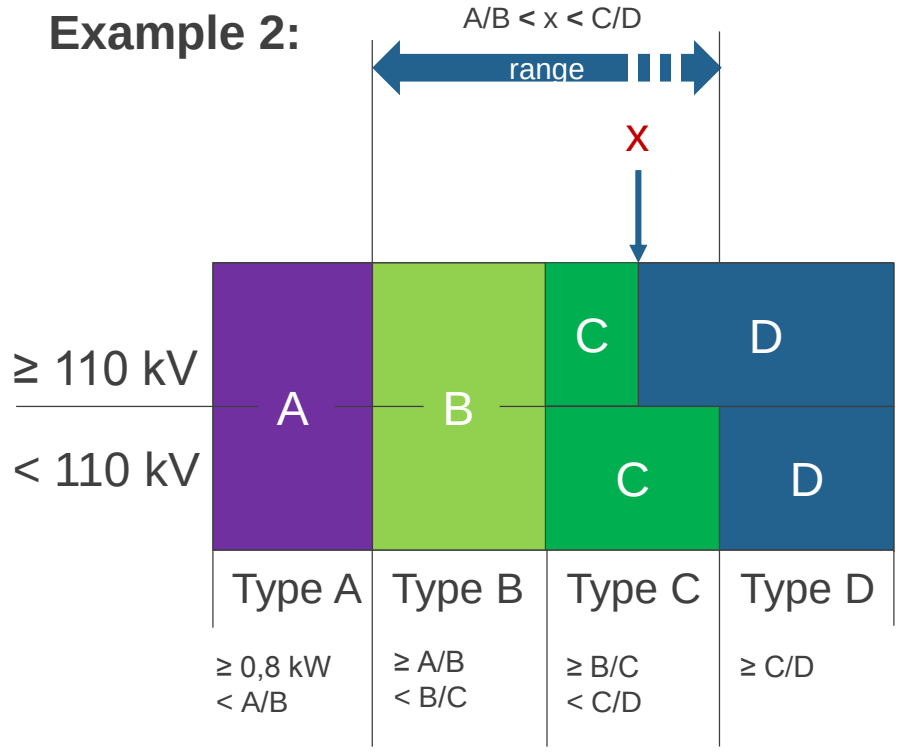
Removal of Voltage Criteria from a Threshold (x) – example of application

"x shall be specified in the range A/B < x < C/D by each relevant TSO"

Example 1:



Example 2:



Key Criteria to Consider

- Solution must not require any member states to reset their capacity thresholds
- Ideally avoiding setting a new threshold, or using an existing threshold, keeps the solution as simple as possible
- Including smaller generators in types A-B is a given. Potentially allowing flexibility for generators in type C is questionable
- The lack of a harmonised position in the setting of capacity thresholds across member states has greatly increased the challenge

Options for Removal up to a Threshold

Options for Removing Voltage Criteria	Need to reset capacity thresholds	Harmonised?	Need to set new threshold for voltage criteria	Can cover type C	Comment & will it work?
Remove completely	Yes	N/A	No	Yes	No - ruled out by ACER as need to respect framework guidelines and would require some TSOs to reset capacity thresholds
Remove up to a threshold of X* MW *(suggested 10MW)	Possibly	Yes	No	Possibly	No – can't find a harmonised value that works for all member states
Remove up to a threshold of X MW which can be set higher	Possibly	Possibly	Possibly	Yes	Could work if initially set low enough but then leads most member states to need to make settings
Remove up to a threshold of X MW which can be set higher or lower	No	Possibly	Possibly	Yes	Flexible solution with a default harmonised value
Remove up to a threshold of X MW which can be set higher up to a member state's threshold from which a power generating module is type C	Possibly	Possibly	Possibly	No	Could work if initially set low enough but then leads most member states to need to make settings
Remove up to a threshold which can be set within a member state's threshold from which a PGM is type C (ie within type B)	No	No	Yes	No	All member states will need to make settings. Doesn't cover type C.
Remove up to a threshold which can be set above a member state's threshold from which a PGM is type B (ie within type B and C)	No	No	Yes	Yes	All member states will need to make settings. Could in effect lead to total removal of voltage criteria.
Remove up to a default of the threshold from which a power generating module is type C (and can be set lower within a member state's thresholds for type B)	No	No	Possibly	No	Not harmonised and doesn't cover type C but avoids imposing having to make settings
Remove up to a default of the threshold from which a power generating module is type C (and can be set higher or lower within a member state's thresholds for type B&C	No	No	Possibly	Yes	Not harmonised but avoids imposing having to make settings

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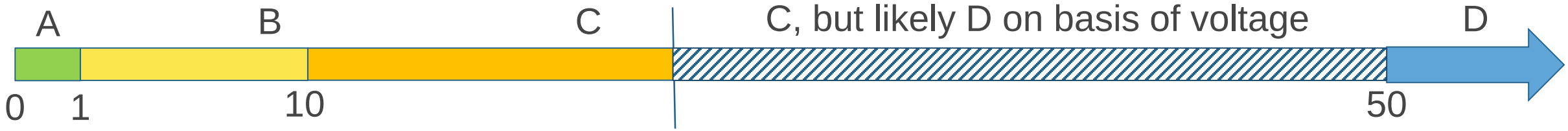
Case Studies

What is the possible impact? (eg GB)

Existing RfG thresholds:

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



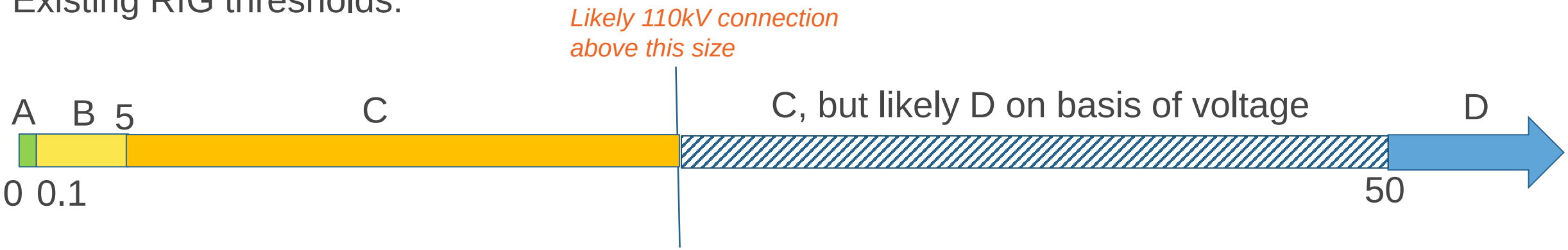
Remove voltage criteria entirely:

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:



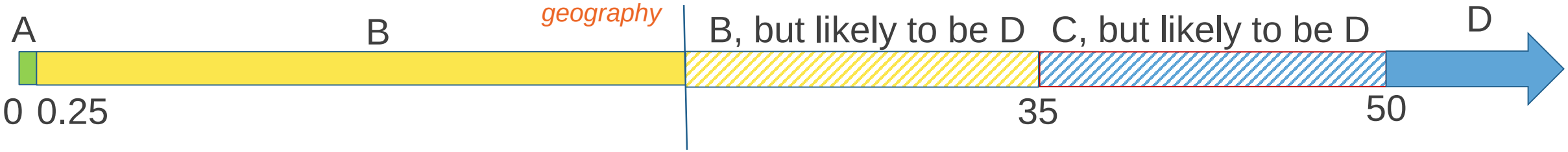
Remove voltage criteria entirely:

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:



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.