

# ACER draft amendments to the Network Code on Requirements for Generators

Fields marked with \* are mandatory.

## Introduction

This consultation aims to present ACER's draft amendments to the Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a **Network Code on Requirements for Grid Connection of Generators ('NC RfG')**.

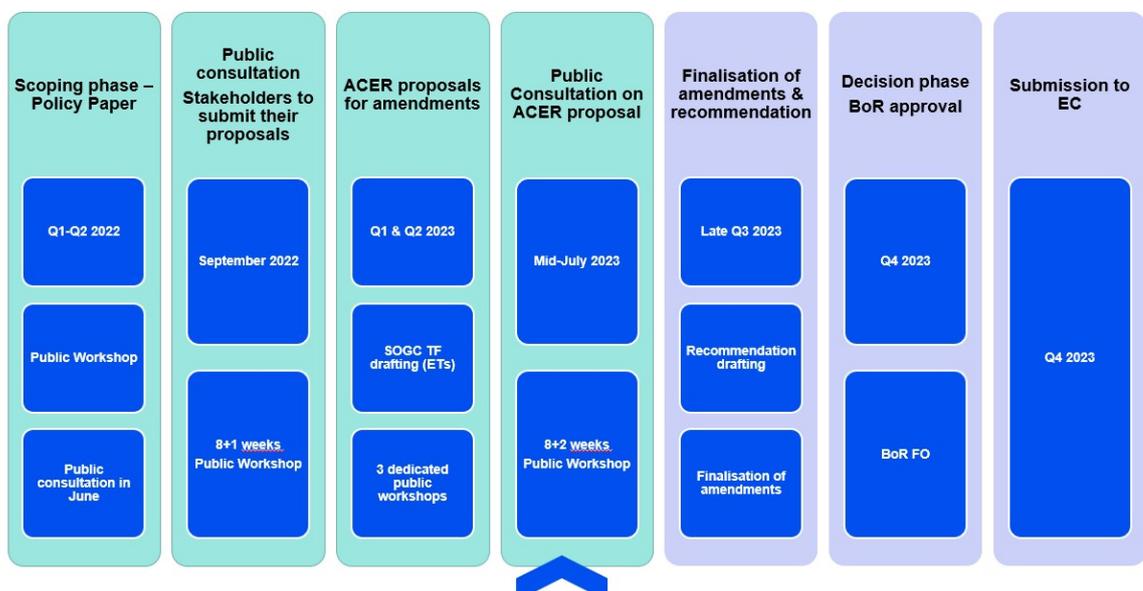
For draft amendments concerning Network Code on Demand Connection ('NC DC'), please go to the respective form: [NC DC](#).

**Responses to this consultation should be submitted by 25 September 2023.**

## Background

Important developments in the policies of decarbonisation of the European Union (EU) energy and transport sectors have taken place since the inception of the development of the first European Grid Connection Network Codes (GC NCs) in 2012.

In the framework of the Grid Connection European Stakeholder Committee (GC ESC), the European Commission proposed for ACER to initiate the process towards the amendment of the existing GC NCs in September 2022. The amendment process, as presented to the GC ESC is outlined in the Figure below:



Following the scoping phase, ACER published the Policy Paper on the revision of the network code on requirements for grid connection of generators and the network code on demand connection in September 2022. The Policy Paper aimed to transparently indicate to stakeholders the key policy areas in which amendments were to be expected.

[Access the ACER Policy Paper on the revision of the NC RfG and NC DC.](#)

As a next step, ACER launched the Public Consultation to gather stakeholders' views and concrete amendment proposals regarding the GC NCs. The stakeholders could submit their inputs by 21 November 2022.

[Access the results of the Public Consultation on the amendments to the grid connection network codes.](#)

Additionally, in the preparation of the draft amendment proposals, ACER organised three dedicated public workshops, namely:

- [electromobility, power-to-gas demand units and heat-pumps](#) (held on 17 April 2023);
- [rate of change of frequency and grid forming capabilities](#) (held on 10 May 2023); and
- [electricity storage](#) (held on 11 May 2023).

After the evaluation of stakeholders' inputs, ACER has formulated its own proposal for the amendments of the GC NCs which is subject to this public consultation.

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## Stakeholder's details

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Find out more how we process your data: <https://www.acer.europa.eu/the-agency/about-acer/data-protection>

\* Name of the stakeholder:

ENTSO-E

\* Contact person:

[REDACTED]

\* Contact person's email address:

[REDACTED]

\* Country of the stakeholder's headquarters or main country of operation:

Belgium

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\* Type of the stakeholder:

- Generator (including association)
- Consumer (including association)
- Transmission system operator (including association)
- Distribution system operator (including association)
- Manufacturers (including association)
- Academia/research institution
- Regulatory authority
- Other (please, elaborate)

Please, elaborate on your answer above, if necessary:

\* Do you consent to the publication of the stakeholder's name?

- Yes
- No

\* Do you consent to the publication of provided answers?

- Yes
- No (please, note that your answer, without your name and organization, may be shared with the EU institutions and national authorities)

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## Instructions

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Stakeholders are invited to submit their comments to the NC RfG articles amended by ACER in three mandatory steps:

1. by downloading the ACER draft amendments in the Word file provided below. The file can also be accessed on the right panel of the consultation form under the Background Documents;
2. by commenting on the ACER's draft amendments through this online consultation form and adding their alternative text proposals to the table, if any; and
3. by uploading the alternative amendment proposals to the **entire NC RfG** using the Track Changes mode in the ACER draft amendments file downloaded from **Step 1**.

Where the stakeholder does not have any comments regarding the amendments, the relevant cells in the consultation form can be left blank.

The mandatory steps for submitting the comments are listed below.

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### ***Step 1***

Please see ACER's draft amendments in the Word file provided below. The file can also be accessed on the right panel of the consultation form under the Background Documents.

## [Download ACER draft amendments to the NC RfG here](#)

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### *Step 2*

**Kindly note that this consultation form follows the structure of the NC RfG amended legal text provided by ACER in Step 1.**

The paragraph numbering in the form reflects paragraph numbers in the amended legal text. Nevertheless, stakeholders can comment on the deleted paragraphs/articles/titles, which are marked as [deleted]. New articles and titles are marked as [new].

Please use this form to comment on ACER draft amendments and/or to provide an alternative text proposal. The instructions are the following:

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below.

Includes new articles

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 1	1	2
Article 3		
Article 4		
Article 4a [new]		
Article 5		
Article 6		
Article 7		
Article 8		
Article 9		
Article 10		
Article 11		
Article 12		

Please write your amendment proposals, if any, in the table below.

	Text amendment proposal (if applicable)
New article	3

Please upload figures or tables if necessary

The maximum file size is 1 MB

Select file to upload 4

1. Leave comments on the ACER draft amendment proposals.
  2. Propose (if any) alternative wording of the relevant provision, as you provided in the Word file.
  3. Provide (if any) your proposals for adding new provisions to the relevant section of the NC RfG, as you provided in the Word file.
  4. Upload figures or tables if necessary; text inputs should be provided directly in the consultation form.
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### ***Step 3***

Where the stakeholder would like to propose an alternative amendment to the **entire NC RfG**, please upload the Word file (**downloaded from Step 1**) containing all your alternative amendment proposals in the Track Changes mode to the next **FILE UPLOAD** section and rename it with your stakeholder's name ("ACER\_draft\_RfG\_stakeholder\_name"). You can also upload your justification documents, where applicable.

**In case the file size exceeds the 1MB limit**, which is a consultation tool limit, kindly send the document to the functional mailbox shown on the right panel of the consultation form. Please rename the file with your stakeholder's name as indicated above and send it with the subject "ACER draft RfG legal text [stakeholder name]". Note that only submissions sent within the consultation deadline will be considered.

To facilitate the process, please, make sure that the **alternative text proposals provided in this consultation form are consistent**, to the extent possible, **with those in the Word file** you are uploading, taking into account the character limitations of each cell (max 5000 characters).

## **FILE UPLOAD**

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Please upload your file here

The maximum file size is 1 MB

Only files of the type pdf,doc,docx,odt,txt,rtf are allowed

**b9aaacf1-4454-4745-81dd-2bd61f1c05b3/ENTSO-E\_response\_executive\_summary.pdf**

**Kindly note that in case the file size exceeds 1MB, the file can be sent to the functional mailbox shown on the right panel of the consultation form under Contact. Please ensure that the file name and email subject are consistent with the instructions in Step 3.**

Please also upload any other document (i.e. **justifications**) below, if relevant.

Please upload your file

The maximum file size is 1 MB

**3761953f-5010-488a-a8a3-ce23fa419825/ACER\_RfG\_ENTSO-E\_review\_protocol.xlsx**

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E\_WindEurope\_Joint\_assessment\_on\_Forced\_Oscillations\_proposal.pdf**

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Due to the significant length of this survey:

- you have the possibility to edit your answer after submission. When clicking on "Submit" button, you will be given a Contribution ID which you can then use to access your answers and edit them, if necessary.
- we kindly suggest that you download the entire survey as .pdf (link on the right), prepare your answers and then upload them at once in the EU Survey Tool, to avoid a session timeout on submission.

The maximum length of each cell is 5000 characters. This is the maximum technical limit set by the EUsurvey tool, which cannot be increased.

## Whereas Section

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Numbers in the first column correspond to the recitals of the amended version of NC RfG Whereas section, including new recitals

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
(1)		
(2)		
(3)		
(s1)	Several stakeholders, including the Expert Group Storage under the Grid Connection European Stakeholders Committee, propose to include this recital along with the relevant requirements.	(s1) Equally, electricity storage plays a key role in the system as different energy storage technologies have a dual behavior of being able to consume electricity from or inject electricity into the grid at different times and scales. For this reason, and due to the specific characteristics of storage and impact on the system, it is necessary to introduce requirements for the grid connection of electricity storage modules. The requirements on electricity storage are considered to be the same as those on power generation modules unless explicitly stated otherwise in this Regulation. In the case of electrical equipment such as synchronous compensators, flywheels and regenerative braking systems which do not fall onto the definition of a power generating module or electricity storage module, the relevant system operator in coordination with the relevant TSO may define the technical requirements that apply.
(s2)		
(4)		
(5)		

(6)		
(7)		
(8)		
(9)	<p>ENTSO-E view is that ACER proposal for whereas (9) is not aligned with the proposed requirements of RfG. The introduction of various "GU classes" contradicts with the technical distinction between "synchronous generating units" and "non-synchronous generating units". Moreover, the aggregation of the Pmax of all GUs that share a connection point (CP) is essential for the sizing of a PGM, given also that NC-RfG requirements apply at CP. ENTSO-E proposal aims to clarify and ensure consistency between the legal provisions and the whereas sections of the NC RfG. Additionally, ENTSO-E would like to ask ACER to define the criteria needed to differentiate between (1) a storage installed within a PPM to provide storage capability and (2) a storage used solely for the purpose of meeting the requirements of this regulation (and this synchronous power generating unit and storage are indivisible and create an SPGM).</p>	<p>The significance of power-generating modules should be based on their size and their effect on the overall system. Synchronous machines should be classed on the machine size and include all the components of a generating facility that normally run indivisibly. An installation containing a set of synchronous machines that cannot be operated independently from each other, such as combined-cycle gas turbine installation, should be assessed on the whole capacity of that installation.</p> <p>Non-synchronously connected power-generating units, where they are collected together to form an economic unit and where they have a single connection point should be assessed on their aggregated capacity.</p> <p>Electricity storage modules integrated to a power-generating module, where the module is either non-synchronously connected to the network or connected through power electronics, used solely for the purpose of meeting the requirements of this regulation should be considered as part of such module while its capacity should not count towards the power-generating module capacity.</p>
(10)		

(**)	<p>A fully autonomous energy island isn't clearly defined in Regulation (EU) 2019/943 and can therefore be confused with other concepts. ENTSO-E proposes to replace "fully autonomous energy island" by "off-grid system" and to define the latter in the Definitions section. Additionally, ENTSO-E observes that NC RfG define technical capabilities for PGM's which shouldn't be mixed with market entities or concepts. Finally, ENTSO-E would like to mention that the term "citizen energy community" is defined in Directive (EU) 2019/944 but not in Regulation (EU) 2019/943. Hence, we kindly ask to revise this paragraph.</p>	<p>Power-generating modules are subject to the requirements of this Regulation regardless of whether they are part of an a "citizen energy community" or a "renewable energy community" as defined in Directive (EU) 2019/944, and Directive (EU) 2018/2001 respectively, another entity, or a form of system users aggregation, unless such energy communities, another entity, or a form of system users aggregation constitutes a off-grid system.</p>
(11)		
(12)		
(13)		
(14)		
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(20)		
(21)		
(22)		

(**)	ENTSO-E believes that the phrase "measures to increase the resilience of power-generating modules could be considered" is not clear.	
(23)		
(24)		
(25)		
(**)		
(26)		
(27)	<p>ENTSO-E is concerned that ACER proposal introduces a risk that implementation of non-exhaustive requirements throughout Europe, which serve the purpose of meeting local and specific system needs of relevant TSOs or DSOs, are driven by standardization organizations whose decision-making procedures involve non-European actors. ENTSO-E would like to emphasize that these standardization organizations have no legal obligation to plan, design and operate the electricity system, neither do they have the legal liability of security of supply. This raises significant legal challenges.</p>	<p>Development of non-exhaustive requirements should, to the extent possible, be carried taking into account possible standards; therefore, permitting the evolution of product standards and, as a consequence, the adoption of the same standards by the industry.</p>
	<p>"The general intention of the NC concerning the minimum capabilities is explained in a new "whereas". Network operator do not expect grid users to behave unexpectedly outside of the minimum capability defined in this NC. In case grid users has different possible and acceptable way to behave outside of the requirements defined in this NC, interest of society should be</p>	

(28)	<p>privileged. As an example, in exceptional temperature conditions, when maximum steady-state loading is reached, derating is preferred over full disconnection. A similar behavior would be expected for reactive power capability defined in NC for a given voltage range. Outside of this voltage range, NC requirements are not explicitly specified but interest of society would benefit for a reduced reactive power support rather than no reactive power support because nothing is requested by the NC. It is however acknowledged that a legally binding requirement covering such an intention is complex as one cannot expect grid user to know what is best for society.</p> <p>Therefore, an approach in a whereas is proposed to offer a guideline in bilateral agreement between grid user and network operator. In the context of reactive power capability, the request of demonstration /information exchange of technical capability of the PGM is added in article 45 (testing) and 52 (simulation). It is indeed of utmost importance that network planning and design take into account the expected behavior of the grid users to take decision in interest of society. Information exchange between grid user and Network operator is therefore needed. ENTSO-E would like to add the following legal text proposal to the whereas 28."</p>	<p>Beyond the technical capabilities defined by the requirements of this Regulation, it is expected, unless specified otherwise, that the power-generating modules maintain providing a support to the system to the best of its ability and coherently with the power-generating module's design and protection philosophies. More specifically system support beyond of the frequency, voltage or reactive power capabilities shall not be withheld unjustifiably.</p>
(29)		
(30)		
(31)		

(32)	The whereas 32 should be part of the Art. 70a (wrongly titled "Transitional provision"). ENTSO-E would like to propose that both the whereas 32 and the referred art. 70a should be reviewed to provide clarity and legal certainty.	
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Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New recital	

## Definitions (Article 2)

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new definitions

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 2(1)		
Article 2(2)		
Article 2(3)		
Article 2(4)		
Article 2(5)		
Article 2(6)		
Article 2(7)		
Article 2(8)		
Article 2(9)		
Article 2(10)		
Article 2(10a)		
Article 2(11)		
Article 2(12)		
Article 2(13)		
Article 2(14)		

Article 2(15)	<p>ENTSO-E would like to propose a legal text variation in order to clarify that the connection point is reflected only to an AC electrical interface. In the future, HVDC systems of multiple DC terminals (commonly known as multi-terminal HVDC grids or DC Grids), developed and owned by various legal entities may evolve in Europe. Hence, it is proposed to make a distinction that connection point is the AC electrical interface, as proposed in the legal text. This would give room in future to define an extension to DC connection point.</p>	<p>‘connection point’ means the AC electrical interface at which the power-generating module, demand facility, distribution system or HVDC system is connected to a transmission system, offshore network, distribution system, including closed distribution systems, or HVDC system, as identified in the connection agreement or as agreed between the relevant system operator and the demand facility owner, power-generating facility owner or HVDC system owner, where an agreement is not required by the relevant SO;</p>
Article 2(16)	<p>ENTSO-E believes that It is not clear what "appropriate" means. ENTSO-E is of the position that the addition of "losses" is confusing. If one considers that <math>P_{max} = P_{gen} - \text{auxiliary power} - \text{losses of the feeder network (or dedicated infrastructure)}</math>, then it is questionable what is the difference between considering that the <math>P_{max}</math> as the net power at the CP. A legal text proposal is provided.</p>	<p>‘maximum capacity’ or ‘Pmax’ means the maximum continuous active power which a power-generating module can produce, less any demand or losses associated solely with facilitating the operation of that power-generating module and not fed into the network as specified in the connection agreement or as agreed between the relevant system operator and the power-generating facility owner, where an agreement is not required by the relevant SO;</p>
Article 2(17)		
Article 2(18)		
Article 2(19)		
Article 2(20)		
Article 2(21)		
Article 2(22)		
Article 2(23)		
Article 2(24)		

Article 2(25)		
Article 2(26)		
Article 2(27)		
Article 2(28)		
Article 2(29)		
Article 2(30)		
Article 2(31)		
Article 2(32)		
Article 2(33)		
Article 2(34)	The term synthetic inertia is defined in the NC RfG and is used for the new provision on grid forming capability. ENTSO-E would like to propose a modification of the existing definition that aims to improve clarity.	'synthetic inertia' means a prescribed electrical dynamic performance provided by a power park module or an HVDC system at its connection point with purpose to emulate the equivalent dynamic effect of the inertia provided by a synchronous power-generating module;
Article 2(35)		
Article 2(36)		
Article 2(37)		
Article 2(38)		
Article 2(39)		
Article 2(40)		
Article 2(41)		
Article 2(42)		
Article 2(43)		
Article 2(44)		
Article 2(45)		
Article 2(46)		
Article 2(47)		
Article 2(48)		

Article 2(49)		
Article 2(50)		
Article 2(51)		
Article 2(52)		
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Article 2(61)		
Article 2(62)		
Article 2(63)		
Article 2(64)		
Article 2(65)		
Article 2(66)		
Article 2(67)		

Article 2(68)	ENTSO-E would like to mention that the sentence "or determined by other appropriate means" is unclear from legal prospective. The reason is that this can be misinterpreted and misused.	'maximum consumption capacity' means the maximum continuous active power which an demand unit or electricity storage module can consume, less any demand or losses associated solely with facilitating the operation of that demand unit or electricity storage module, as specified in the connection agreement or as agreed between the relevant system operator and the demand facility owner or power-generating facility owner, where an agreement is not required by the relevant SO.
Article 2(69)	ENTSO-E would like to request to replace grid with network. There is a clear use of the term network in the NC RfG.	'V1G electric vehicle' means the vehicle that is powered, fully or in part, with electricity and can only withdraw electricity from the network.
Article 2(70)	ENTSO-E would like to request to replace grid with network. There is a clear use of the term network in the NC RfG.	'V2G electric vehicle' means the vehicle that is powered, fully or in part, with electricity and is equipped with technology enabling the vehicle to provide electricity to the network.
Article 2(71)	ENTSO-E would like to ask for clarification on what are the differences between "electrical charging park" and "electric vehicle supply equipment". We understand that above the 1MW it is an ESM and below it is an "electric vehicle supply equipment".	'V1G electric vehicle supply equipment' means the electrical infrastructure necessary to safely conduct electrical energy from the electricity supply network to the electric vehicle with demand-only behavior. Electrical wirings are not deemed part of an electric vehicle supply equipment.

Article 2(72)	ENTSO-E would like to request to clarify differences between "electrical charging park" and "electric vehicle supply equipment".	'V2G electric vehicle supply equipment' means the electrical infrastructure necessary to conduct electrical energy safely from the electricity supply network to the electric vehicle and from the electric vehicle to the electricity supply grid with both generation and demand behavior. Electrical wirings are not deemed part of an electric vehicle supply equipment.
Article 2(73)	ENTSO-E would like to request to clarify differences between "electrical charging park" and "electric vehicle supply equipment". This is not used neither in RfG nor DCC.	'V1G electrical charging park' means an ESM where three or more V1G electric vehicles can be simultaneously connected to it.
Article 2(74)	ENTSO-E would like to propose the idea that V2G electrical charging parks are treated as ESM when they are above a given capacity threshold (following the A/B threshold). It is important for ENTSO-E that electrical charging parks fulfil requirements based on the aggregated capacity at a connection point (e.g. charging parks should be also treated as SGU and fulfil data-exchange requirements). ENTSO-E considers it problematic that SO-GL (EU Regulation 2017/1485 does not cover the new EV types introduced in RfG 2.0.	'V2G electrical charging park' means an ESM where one or more V2G electric vehicles can be simultaneously connected.
Article 2(75)		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
	<p>NEW2 (XX): ENTSO-E would like to introduce a new definition of 'off-grid system' instead of "fully autonomous energy island(s)".</p> <p>Legal proposal: 'Off-grid system' means an electrical system connecting generation, consumption and/or storage which is not part of a distribution or transmission system and which has no components/assets (for example switch gear) to be connected to the transmission or distribution system.</p> <p>NEW 2(XX): After several discussions between ENTSO-E and EG HCF on the need for introducing in the legal text relevant topics regarding the certification process of PGMs, ENTSO-E's initial position was leaving this topic entirely to a new IGD or modify the existing ones on compliance; However, due to the persistence of EG HCF in including a lot of wording related to the certification process in the legal text (equipment certificates, compliance schemes), ENTSO-E's position is that the level of detail to be introduced in the legal text regarding certification process should be very general, and the details should be defined at national level in order to not interfere with existing, or under development, processes in the Member States that are following such approach for the compliance process of PGM with RfG requirements. In such situation, ENTSO-E's proposal would be to introduce a new article called "common provisions on equipment certificates" in the Chapter 1 "Compliance Monitoring" under Title IV "Compliance" with the motivation of: 1) State the need for specifying a compliance scheme, in case the RSO decides to use equipment certificates ; 2) possibility of mutual recognition of equipment certificates between MS, and 3) possibility of issuing certificates for power generating units or components that belong to a family. ENTSO-E would like to have the proposed legal text in the new Article 44 under Title IV, Chapter 1, however, the proposed legal text was added to the new Article 41a in order not to violate</p>

## New definition

the order of all articles. Apart from this new article, there is a need for new definitions related to certification process.

Legal proposal:

"(XX) 'power generating unit' or "PGU" means an aggregation of components converting a primary source of energy into electricity at the terminals of the PGU, which is synchronously connected to the network in case of be part of SPGM or which is either non-synchronously connected to the network or connected through power electronics in case of be part of PPM.

(XX) 'component' means any hardware element or software application having an impact on the electrical characteristics and /or operation of a power generating unit or a power-generating module.

(XX) 'PGU family' means a group of PGUs from the same manufacturer with equivalent characteristics to the representative unit which has undergone conformance tests (tested unit), in terms of electrical performance. The extent of the PGU family will be defined within the compliance scheme by the RSO.

(XX) 'Component family' means a group of components from the same manufacturer with equivalent characteristics to the representative component which has undergone conformance tests (tested component), in terms of electrical performance. The extent of the component family will be defined within the compliance scheme by the RSO.

(XX) 'Compliance scheme': With regards to the CNC, it refers to the compliance verification programme, i.e. the verification scheme specifying the applied Equipment Certificates, onsite tests and/or simulations aimed to demonstrate the compliance of the equipment with the requirements of the relevant CNC during the operational notification issuing process. This should be provided by the PGF owner and agreed with the RSO, including details related to the applied EqCs and supplementary onsite testing and/or the required electrical simulation models. The applied EqCs must be valid for the specific PGM, demand unit and HVDC system for which a connection request has been made. "

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## TITLE I - General provisions

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the

Includes new articles

	Comment on the ACER draft amendments	Alt
Article 1		
Article 3	<p>There is no definition of a fully autonomous energy island. ENTSO-E proposes to replace "fully autonomous energy island" by off-grid systems. The new formulation would also help to establish a clearer distinction between PGM technical requirements, which the NC RfG addresses, and market concepts (out of scope).</p>	<p>(2) ins no dis anc tha sys ope tes cot</p>
Article 4	<p>(2)(b) ENTSO-E believes that the deletion in point 2 (b) does not provide a legal certainty for the relevant TSO. The notification of the conclusion of the contract would facilitate the clarification of the status of the PGM.</p> <p>(2)(b) ACER considers that the notion of "Significant modernization" must only apply to PGM connected after the entry into force of this Regulation. This is not necessary as the NC RfG cannot have retroactive effects on PGMs connected before its entry into force.</p>	
Article 4a [new]	<p>ENTSO-E would like to highlight that ACER proposal diverges from the recommendation of EG CSM report under GC ESC. The reference to 'successive modernization' may introduce potential difficulties because it is not clear what is the baseline for these successive modernizations steps and it should be removed. Therefore, we recommend to use the ENTSO-E proposal with regard to significant modernization (which is based on the EG report).</p>	
	<p>(2) ENTSO-E would like to highlight that the reduction of upper limit for type A/B from 1 MW to 0,5 MW will have huge impact on retrieving high quality forecast data from Significant Grid Users (SGUs) as required in SOGL, because SGU are defined in SOGL as B, C and D PGMs of RfG. This would result in significant increase in resources from TSO, DSOs and connected parties for enabling this increase of data exchange. This impact on SOGL should be addressed either in RfG 2.0 or in next version of</p>	

Article 5

SOGL.

(2) ENTSO-E proposes the following two modifications of the legal text: 1) the use of park instead of vehicle and 2) the change of the threshold.

1) The maximum capacity for V2G is defined at V2G electrical charging park level and that those are identified as ESM (see comment on definitions) to ensure they comply with the same requirements than PGMs (the introduction of specific/differentiated requirements should not be the default rule). The collection of EVs behind a same connection point that constitute a charging park shall be aggregated when the total capacity of the charging park is above a threshold.

2) With regard to the threshold, ENTSO-E sees the benefits of aligning the requirements of installations above the A/B threshold with SO GL requirements applicable to significant grid users (esp. on data exchanges). For this reason, ENTSO-E believes the threshold of 1MW has to be changed to the A/B threshold defined at national level.

(4)(a) ENTSO-E would like to request that it shall be possible to decrease the threshold down to 5 MW regardless of the existing national B/C or C /D thresholds.

(6)(c) ENTSO-E wants to raise awareness that the A/B-threshold is harmonized to a maximum of 500kW. It seems illogical that the threshold for EV3 goes up to 1MW. ENTSO-E supports the view that any charging units or a collection of charging units with a total capacity behind a single connection point that results to more than 500 kW (threshold A/B) is treated as charging park and for it the ESM requirements apply. ACER needs to check if the 500 kW A/B threshold has an impact on SO GL and data forecast prognosis.

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<p>Article 6</p>	<p>(2)(e) This provision may challenge processes in certain Member States where pumped hydro PGMs are used during the system restoration to stabilize the island with frequency that could go below 49Hz for a limited time.</p> <p>(2)(j) There is a typo in 6.2.j), "if the maximum response time <math>T_{resp}</math> according to Article 13(3)(g) is greater than the value set out in Article 13(3)(g)".</p>	<p>(2)(e) in pumping operation mode, no technical capability to remain connected and continue operation is requested if the frequency is below 49 Hz, unless the relevant TSO defines a higher value or unless another value is agreed between the relevant TSO and power-generating facility owner if it is required in the context of system restoration.</p> <p>(2)(j) to pump-storage power-generating modules with variable speed machines, the power generating facility owner shall provide technical evidence demonstrating why a longer time is needed, if the maximum response time <math>T_{resp}</math> according to to figure XX is greater than the value set out in Article 13(3)(g)". The power-generating facility owner and the relevant system operator shall agree on the acceptable response time.</p>
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Article 7	<p>(3)(f) ENTSO-E supports the important step to make IGDs more binding for the national implementation of the connection network codes. In addition, ENTSO-E would like to ask for clarification on what is the term "local system needs". Moreover, the inclusion in Art.7.3.f of the term "nuclear safety rules" is not in agreement with the fact that NC RfG does not discriminate the fuel used from PGMs.</p> <p>(4) ENTSO-E supports this amendment however it should be possible to coordinate with the relevant TSO if it is feasible or if this shorter time is linked to system needs.</p>	<p>Following a request from the relevant TSO, the Member State may provide for a shorter time period for all or parts of the requirements or the methodologies. In this case, the Member State shall communicate the shorter time period to the European Union Agency for the Cooperation of Energy Regulators (ACER).</p>
Article 8		
Article 9		
Article 10		
Article 11		
Article 12		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## TITLE II CHAPTER 1 - General Requirements

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**General requirements for type A power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 13(1)		
Article 13(2)	(d) ENTSO-E would like to highlight that the 52,5 Hz is not included in the table 2 but it is put as an additional requirement in Art. 13.2.d. ENTSO-E thinks that this should not be the case, as each time we refer in this table, we would exclude this requirement. So we would ask to please add in table 2 as done for the NC DC proposal.	
Article 13(3)	(g) For this article, ENTSO-E would like to propose an editorial improvement.  (h) ENTSO-E would like to ask to modify this legal text proposal as follows.	(g) The response time, Tresp in Figure XX, for active power decrease in case of increasing frequency, shall be as fast as technically feasible and as described below:  (h) An electricity storage module shall be capable of activating LFSM-O from the current active power input or output automatically up to the maximum consumption capacity according to the indicative Figure 1 to the extent that is technically feasible. A frequency threshold and a droop setting specified by the relevant TSO in accordance with paragraph (3)(a) of this Article shall apply.
Article 13(4)		
Article 13(5)		
Article 13(6)		

Article 13(7)		
Article 13(8)		
Article 13(9)		
Article 13(10)		
Article 13(11)		
Article 13(12)	<p>ENTSO-E considers that ACER proposal neglects the possibility of having type A PGMs above 1kV, below 110kV and above 110 kV. Therefore, we would like to propose an alternative approach as follows, which takes care of this gap and should be considered with changes as proposed in Art. 14.2.a</p>	<p>With regard to voltage stability, unless otherwise provided in this Regulation, the power-generating module shall be capable of staying 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 1 kV. With regard to voltage level above 1 kV and below 110 kV the relevant system operator, in coordination with the relevant TSO, shall specify ranges of the network voltage at the connection point within which a power-generating module shall be capable of staying connected to the network and operating. The specification shall include minimum time periods during which a power-generating module must be capable of operating for voltages deviating from the reference 1 pu value at the connection point without disconnecting from the network. The voltage ranges shall cover at least the range of 0,85 pu - 1,1 pu.</p>

Article 13(13)	ENTSO-E considers this article needs more clarity in order to avoid confusion. There is a risk here that we loose important technical requirements due to temperature conditions. This could be misunderstood and misused by stakeholders. ENTSO-E proposes a new legal text to improve readability and avoid misinterpretation.	
Article 13(14)		

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	Text amendment proposal (if applicable)
New provision	

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**[NEW] General requirements for type EV1 and EV2 V2G electric vehicles and associated V2G electric vehicle supply equipment**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 13a(1)	Table XY should contain the outer boundaries of all the synchronous areas. Hence, we ask to increase the duration in order to stay connected within this f-range. On that ENTSO-E proposes a solution:	Frequency range: 47,0 Hz-47,5 Hz for 20s, 47,5 Hz-48,5 Hz for 90 min 48,5 Hz-49,0 Hz for unlimited 49,0 Hz-51,0 Hz for unlimited 51,0 Hz-51,5 Hz for 90 minutes 51,5 Hz-52,0 Hz for 15minutes, 52,0 Hz-52,5 Hz for 10s

Article 13a(2)	<p>It is not clear for ENTSO-E the meaning of "cyber-protected data exchange interface" and the reason it should be different to PPMs. ENTSO-E suggests to make this definition as part of the NC DC as well. In addition, ENTSO-E would like to ask to cross check and full harmonization of wording and requirements between V1G and V2G. The possibility to disconnect V1G is not included in DCC and it should be as can give an important defense mechanism for stable system operation. It is important for TSOs to make sure that V1G can be also be disconnected by the TSOs. Wording for "cyber-protected data exchange interface" should be aligned. ENTSO-E proposes to use a more generic definition, such as "communication interface". Finally, for system security, active power reduction signals from the RSO (or TSO) shall not be implemented via over-the-air mechanisms or clouds (or via EV manufacturers platforms) as it imposes increased risks to system security.</p>	
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<p>Article 13a(3)</p>	<p>Regarding autonomous reconnection of EV1 and EV2, ENTSO-E proposes to keep the same settings as in article 13.9. The threshold of 50,1 Hz for Continental Europe would facilitate the restoration process in the initial stages. It would mitigate the significant impact that this autonomous reconnection would have on system operation while maintaining the targeted frequency within normal operation ranges. ENTSO-E considers that a threshold of 50,2 Hz is too high since it is the value for entering in emergency state as per SO - GL. Moreover, the minimum observation time should be set at 60 seconds to ensure reliability and coherence with requirements in article 13 and 13a.4. ENTSO-E recommends to harmonize requirements in article 13a.3 for all PGMs.</p>	<p>(a) Frequency range <math>49.8 \text{ Hz} \leq f \leq 50.1 \text{ Hz}</math>;</p>
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<p>Article 13a(4)</p>	<p>Regarding autonomous reconnection after tripping as per same reasons than already stated in article 13a.4: ENTSO-E proposes to add "Autonomous connection is allowed unless specified otherwise by the relevant system operator in coordination with the relevant TSO". Moreover, we proposal to keep same settings as in article 13.9 as 50,1 Hz (Continental Europe) to allow restoration initial stages at higher frequency in order to avoid impact of autonomous reconnection but keeping this targeted frequency within normal operation ranges (50,2 Hz too high since it is the value for entering in emergency state as per SOGL). Moreover, the minimum observation time 60s for reliability and coherence purposes with 13 and 13a.4. Please harmonize 13a.3 with PGMs.</p>	<p>Unless specified otherwise by the relevant system operator in coordination with the relevant TSO, a type EV1 and EV2 V2G electric vehicle and associated V2G electric vehicle supply equipment may autonomously reconnect to the network after tripping due to a system disturbance under the following conditions:  (a) Frequency range <math>49.8 \text{ Hz} \leq f \leq 50.1 \text{ Hz}</math>;  (b) Minimum observation time: 60 s.</p>
<p>Article 13a(5)</p>	<p>ENTSO-E recommends to establish a default and harmonized across EU default setting within a given droop range. ENTSO-E considers that the value of this default setting should be <math>s=5\%</math> in figure YY. The NC RfG should provide a mechanism to update such harmonized default setting. Otherwise, there is a risk that the 5% value is not optimal considering the ever changing conditions of the continental power system in terms of share of variable renewables and frequency stability.</p>	
<p>Article 13a(6)</p>		

Article 13a(7)	ENTSO-E notes a possible mistake in the referencing. Paragraphs 2 and 4 should be paragraphs 5 and 6.	
Article 13a(8)		
Article 13a(9)	ENTSO-E considers that the Uret for EV1 and EV2 should be the same as for PPM type A: 0,05 p.u and not 0,15p.u. Although this value was initially proposed by ENTSO-E for type A PPMs, recent discussions on the minimum threshold of 100 kW for type A/B as well as a recent study from Spain, have shown that this value needs to be 0,05p.u in order to avoid large scale tripping of EVs and PPMs in case of faults in the transmission grid.	Table x.1.1 - Uret to be 0.05p.u
Article 13a(10)		
Article 13a(11)		

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	Text amendment proposal (if applicable)
New provision	

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**General requirements for type B power-generating modules**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 14(1)	<p>Nordic TSOs consider the presence of 330kV in table xx1 and Table 10 redundant as such voltage levels does not exist the network.</p> <p>(1) ENTSO-E considers that the references to the requirement in article 13 should be checked. For example, requirement in article 13(2)(b) is excluded for type B PPM, but there is no more ROCOF requirements in article 14 for type B PPMs. A similar issue exists for the exclusion of article 13(9) requirement from the article 14.</p>	
Article 14(2)[deleted]		
Article 14(2)	<p>(a) ENTSO-E considers that ACER proposal neglects the possibility of having type B, C and D connected below 110 kV. The removal of voltage criterion for the determination of significance (Article 5) creates confusion with type-B PPMs requirements. ENTSO-E proposal aims to solve this issue by removing Art. 14.2.a and placing it in Art. 13.12. Additionally, ENTSO-E would like to modify the accuracy of the 220 kV tables.</p>	<p>(a) On 220 kV in the table it should 0,9 p.u - 1.1136 p.u and not 1,113 p.u. (according to the standards). We recommend to 4 digits after the comma.</p>
Article 14(3)	<p>ENTSO-E believes that the consecutive faults is a cross-border issue that the NC RfG should address. Also, this would support the harmonization of PGM across EU.</p>	

Article 14(4)	(c) In the Art. 14.4.c for type B, the information exchange includes type C requirements.	
Article 14(5)	(5)(d)(iii) ENTSO-E proposes an editorial change.	if required by the relevant system operator power-generating facilities shall be capable to provide fault recording for the following parameters:

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	Text amendment proposal (if applicable)
New provision	

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**[NEW] Requirements for type EV3 electric vehicles and associated V2G electric vehicle supply equipment and V2G electrical charging parks**

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 14a(1)		
Article 14a(2)	<p>(a) ENTSO-E would like ACER to provide a transparent explanation behind the proposal in article 14a regarding EV3 and the proposed range of 0,9-1,1p.u. ENTSO-E proposes instead to associate the EV3 requirements with the ESM or type B requirements for PPM. This alternative propose would be: 0,85 p.u - 0.9p.u. (at least 60min in line with Table XX.1) and the 0,9-1.1p.u. (unlimited). This would be a fully harmonized approach and in line with the rest of the requirements. ENTSO-E is concerned that a value of 0.9 p.u does not address system needs whereas FRT profiles are expected to be stabilizing at 0.85pu. If the PGM passes the FRT and then disconnects because it cannot maintain 0.85 pu, FRT profile is not meeting its purpose. Besides, in case of a 66kV connected EV3 charging park, the value 1,1p.u would be beyond the material standards. It is of high importance that dispersed generation and storage, including EV3, do not disconnect during high voltage events. Therefore, ENTSO-E recommends that a high voltage ride profile should be defined for these equipment. Moreover, for type A, ENTSO-E proposes a value of 1 kV instead of 400V.</p>	
Article 14a(3)		
Article 14a(4)		

Article 14a(5)		
Article 14a(6)		
Article 14a(7)		
Article 14a(8)		

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	Text amendment proposal (if applicable)
New provision	

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### General requirements for type C power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 15(1)	In Art 15(c) what does the "mode" means (as used by ENTSO-E). The proposal of ENTSO-E should be interpreted like a freeze of the LFSM O/U setpoint. This needs to be clarified to avoid misunderstanding and wrong interpretations.	
Article 15(2)	<p>(d) ENTSO-E position is that if an ESM is used solely for the purpose of meeting the RfG requirements (which in this case the requirement could be FSM), this ESM which is integrated in the PGM shall follow the PGM requirements. ENTSO-E consider that this text does not follow EG Storage definitions (autonomous/standalone ESM vs collocated ESM) because ESMs are treated as something different than the PGMs whereas the definition of Article 2 (67) clarifies that an ESM is considered as a PGM with the capability of absorbing (consuming) active power. It should be also explained what is the "energy content" of a PGM that it is not an ESM.</p> <p>(d) Table 4: ENTSOE-E proposes to change the insensitivity from 0,06% to 0,03% (possible typo)."</p>	(d) [...] in case of overfrequency, the active power frequency response is limited by the minimum regulating level. In case of electricity storage modules, the active power frequency response is limited by the minimum regulating level or maximum consumption capacity, or the maximum energy content (as declared by the manufacturer) that the electricity storage module can store in its operative condition or as agreed between the power generating facility and the relevant TSO, [...] the actual delivery of active power frequency response depends on the operating and ambient conditions, as well as, on the underlying energy storage technology for the, of the power-generating module when this response is triggered, in particular, but not limited to, limitations on operation near maximum capacity at low frequencies according to paragraphs 4 and 5 of Article 13 and available primary energy sources;
Article 15(3)[deleted]		
Article 15(3)		
Article 15(4)		

<p>Article 15(5)</p>	<p>(b) As the instantaneous voltage and current are the measured data, current should be in the list of records.</p> <p>(c)(i) ENTSO-E would like to propose to remove the sentence referring to the intellectual property. The NDAs which are made available on projects are capable to safeguard the intellectual property. Also Art. 12 includes the same general provision with regard to confidential information.</p> <p>(c)(iv) "ENTSO-E does not understand what is the reason for the EMT model to be valid only for specified control modes, and not for all control modes (as required for RMS model). "be valid for specified operating range and control modes of the PPM in the positive, negative and in the zero phase sequence"</p> <p>(c)(vi) ENTSO-E proposes to consider points (iv) et (v) for this requirement. EMT model and frequency domain model shall be coordinated with the relevant TSO.</p>	<p>(c)(i)</p>
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Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	<p>Article 15(6)(c) For the RMS models, there is a clause" The simulation model requirements and data provided shall not violate manufactures intellectual property". ENTSO-E does not support this clause or 15(6)(c)(i) ENTSO-E considers that some IP exists for EMT models but not for RMS as defined in the relevant part of RMS. Many TSOs require open sources models for RMS simulations and many OEM provide them. This clause may be wrongly interpreted and be used by OEM to provide less demanding models. It should be noted that for SPGMs like nuclear plants, open sources detailed RMS models have been provided. The same may apply to RMS models of PPMs. There is a risk that thus clause would be missed. It should apply only for EMT models, where some level of black boxing and encryption is accepted.</p>

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## General requirements for type D power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 16(1)		
Article 16(2)		
Article 16(3)	<p>(a) ENTSO-E would like to highlight that the FRT profile is less strict for type D installation connected below the 110 kV and does not go at Uret of zero. ENTSO-E suggests changing this need because a large number of offshore project expected to be connected at 66kV, mainly DC connected. In future DC connected PPMs will have 66 kV connection point to the offshore HVDC platform, in scale 400-500MW. Therefore, ENTSO-E considers that FRT shall be down to zero.</p> <p>(a)(i) There is no 16.2.b.ii in ACER's proposal. It must be 14.3.lv (PGM) 14a.3.iv (EV3)For ENTSO-E it is not acceptable to have the clause "when operating above their minimum stable operating level". Some stakeholder may misunderstand it and misuse it. Please note that the operation point changes due to a dynamic event, see faults. For example, if there is a fault, the active power may oscillate and go below the min stable operating level, so this may trip the PGM cancelling the need for FRT. It makes sense to have this in the pre-fault condition. Hence, it is the view of ENTSO-E that this need to be transported in the pre-fault. The proposed amendment does not refer to the</p>	<p>(a) That lower limit shall also be specified by the relevant TSO, using parameters set out in Figure 3 and within the ranges set out in Tables 3.1.1, 3.1.2, 3.2.1 and 3.2.2 for type D power-generating modules connected below the 110 kV level; The tables 7 apply when article 25 is referred.</p>

	<p>pre-fault conditions. If following clarification will be added "when operation above the minimum stable operating level", it should be done in 16.2.</p> <p>b.ii. However, ENTSO-E believes the existing legal text impose already to RSO to define the prefault operating points of the PGM for which the requirement shall be met. Same comment for 13a.9, 14.3.a.i and 14a.3.a.i.</p> <p>(d) ENTSO-E believes that the consecutive faults is a cross-border issue that the NC RfG should address. In addition, this would support the harmonization of PGM across EU.</p>	
Article 16(4)		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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## TITLE II CHAPTER 2 - Requirements for synchronous power-generating modules

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**[NEW]** Requirements for type A synchronous power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article X	ENTSO-E recommends a High voltage ride through requirement for EV3 to ensure that distributed generation and storage, including EV, do not disconnect during high voltage event. It could be based on the same requirement as for PGMs type B.	

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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### Requirements for type B synchronous power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 17(1)		
Article 17(2)		
Article 17(3)		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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### Requirements for type C synchronous power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 18(1)		
Article 18(2)	<p>ENTSO-E welcomes the changes proposed in article 18.2.b.i which are in line with our proposal. However, this proposal should be consistent with the approach we suggest for article 13.10 (which is used in the new figure 7) whereby voltage range are defined for all voltage levels. Please check that the references made are correct.</p>	

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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## Requirements for type D synchronous power-generating modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 19(1)		
Article 19(2)		
Article 19(3)		
Article 19(4)	<p>ENTSO-E does not support the exclusion of type D SPGMs based on the 400 MW capacity threshold. The source of this value seems to be based on past experience of existing units installed in one country that may not reflect other countries and modern design of specific sites. The RoCoF withstand capability is a major design parameter for power systems. ENTSO-E would like to propose an alternative approach as follows:</p>	<p>With regard to frequency stability:</p> <p>(a) If technically justified by the facility owner, a type D SPGM can apply for an exception to the relevant TSO from the 2Hz/s over a period of 0,5 s requirement. In that case, the minimum capability shall be as high as technically possible but not less than:</p> <ul style="list-style-type: none"> <li>- 1 Hz/s over a period of 1 s;</li> <li>- 0,75 Hz/s over period of 2 s;</li> <li>- 0,65 Hz/s over period of 4 s;</li> </ul> <p>(b) if the rate-of-change-of-frequency is used for loss of mains protection, the relevant system operator, in coordination with the relevant TSO, shall specify the threshold of this rate-of-change-of-frequency-type loss of mains protection.</p>

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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## TITLE II CHAPTER 3 - Requirements for power park modules

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**[NEW]** Requirements for type A power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article Y(1)		
Article Y(2)		
Article Y(3)		
Article Y(4)		
Article Y(5)		
Article Y(6)	ENTSO-E would like to highlight that there is no derogation from article 4(2)(a) but only from Art 4 (2)(b).	By way of derogation from Article 4(2) with regard to grid forming capability, a power park module shall be considered existing if

<p>Article Y(7)</p>	<p>"ENTSO-E does not support the part of activation and deactivation for grid forming capability for all PPMs types. Unlike the reactive power modes of the PPM, ENTSO-E acknowledges that grid forming has a significant impact on the design and compliance, increasing costs and potentially making it uneconomical. But ENTSO-E considers it will become a core requirement to address future system needs. ENTSO-E therefore recommends the following:</p> <ul style="list-style-type: none"> <li>- mandatory requirement for all type C and D PPMs</li> <li>- mandatory grid forming capability for all type B PPMs at and above the 110 kV voltage levels</li> <li>- mandatory grid forming capability for all type B PPMs below 110 kV only if it is directly connected to a substation (bus-bar) with dedicated feeder</li> <li>- non-mandatory grid forming capability for other type B PPMs as long as a roadmap is developed to assess a further roll-out of this capability (including an impact assessment on island mode detection)"</li> </ul>	<p>Member State or the entity designated by the Member State shall provide the formal and substantive conditions under which the relevant system operator may conduct grid forming specification for type A PPM.</p>
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<p>Article Y(8)</p>	<p>(c) ENTSO-E proposes an editorial improvement.</p> <p>(c)(i) ENTSO-E would like to raise awareness of the term voltage control as used in this article. We believe it might sound misleading since voltage control could be interpreted by stakeholders as a steady state requirement, which here is not the case. Hence, we propose a small modification as follows:</p> <p>(c)(ii) ENTSO-E proposes following change.</p>	<p>(c) .. Inherent energy storage means an energy reserve available in physical components of a power park module, which has not necessarily been designed to suit the grid forming requirements of this article, but may be used for such purposes, without affecting the design of the physical components of individual units.</p> <p>(c)(i) The relevant system operator in coordination with the TSO shall specify the temporal parameters of the dynamic performance regarding voltage stability.</p> <p>(c)(ii) Where current limitation is necessary, the relevant system operator in coordination with the relevant TSO may specify additional requirements regarding contribution of active and reactive power at the point of connection.</p>
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Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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### Requirements for type B power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 20(1)	<p>"ENTSO-E does not support the part of activation and deactivation for grid forming capability for all PPMs types. Unlike the reactive power modes of the PPM, ENTSO-E acknowledges that grid forming has a significant impact on the design and compliance, increasing costs and potentially making it uneconomical. But ENTSO-E considers it will become a core requirement to address future system needs. ENTSO-E therefore recommends the following:</p> <ul style="list-style-type: none"> <li>- mandatory requirement for all type C and D PPMs</li> <li>- mandatory grid forming capability for all type B PPMs at and above the 110 kV voltage levels</li> <li>- mandatory grid forming capability for all type B PPMs below 110 kV only if it is directly connected to a substation (bus-bar) with dedicated feeder</li> <li>- non-mandatory grid forming capability for other type B PPMs as long as a roadmap is developed to assess a further roll-out of this capability (including an impact assessment on island mode detection)"</li> </ul>	<p>Type B power park modules shall fulfil the requirements laid down in Article 13, Article 14, except for Article 13(2)(b) and, Article 13(8).            With regard to grid forming capability:            (a) Type B power park modules connected at and above 110 kV shall fulfil the requirements laid down in Article Y(6) and Y(8).            (b) Type B power park modules connected below 110 kV shall fulfil the requirements laid down in Article Y(6) and Y(8) if it is connected to a feeder dedicated to one or more power park modules connected to substation with transformation to 110 kV or above;            (c) The member state or the entity designated by the member state shall set out a formal process of whether and under what conditions type B power park modules connected below 110 kV other than paragraph 1 (b) shall fulfil the requirements laid down in Article Y(6) and Y(8)."</p>
		<p>"(b) If the grid forming capability requirement according Art. Y does not apply, the relevant system operator in coordination with the relevant TSO shall have the right to specify that</p>

<p>Article 20(2)</p>	<p>(b) and (c): ENTSO-E does not support the deletion of the fast fault current requirement already stated for type B PPMs when they are in Grid following mode.</p>	<p>a power park module be capable of providing fast fault current at the connection point in case of symmetrical (3-phase) faults, under the following conditions:</p> <p>(i) the power park module shall be capable of activating the supply of fast fault current either by:</p> <ul style="list-style-type: none"> <li>— ensuring the supply of the fast fault current at the connection point, or</li> <li>— measuring voltage deviations at the terminals of the individual units of the power park module and providing a fast fault current at the terminals of these units;</li> </ul> <p>(ii) the relevant system operator in coordination with the relevant TSO shall specify:</p> <ul style="list-style-type: none"> <li>— how and when a voltage deviation is to be determined as well as the end of the voltage deviation,</li> <li>— the characteristics of the fast fault current, including the time domain for measuring the voltage deviation and fast fault current, for which current and voltage may be measured differently from the method specified in Article 2,</li> <li>— the timing and accuracy of the fast fault current, which may include several stages during a fault and after its clearance;</li> </ul> <p>(c) with regard to the supply of fast fault current in case of asymmetrical (1-phase or 2-phase) faults, the relevant system operator in coordination with the relevant TSO shall have the right to specify a requirement for asymmetrical current injection."</p>
<p>Article 20(3)</p>		



Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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### Requirements for type C power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 21(1)	ENTSO-E would propose to include a requirement for asking the possibility of performing control interaction studies for type C PPMs if deemed necessary by the TSO. ENTSO-E also recommends to clarify the situation during the transitional period.	(a) The relevant system operator may specify that a study is required and may specify its scope in order to ensure that no adverse control interactions occur during normal operating conditions (non-disturbed grid conditions), quasi immediately after a grid disturbance, during grid fault conditions and during the post fault operation where voltage and frequency profiles have returned to normal operating conditions.
Article 21(2) [deleted]		
Article 21(2)	<p>(d)(i) and (viii) ENTSO-E would like to propose an improved legal text on this part.</p> <p>(f) ACER added in Type C PPM a POD functionality. ENTSO-E supports this but it should be also aligned with the type D requirement in terms of tuning as well as approval from the TSOs of the tuned values.</p>	<p>(i) The power park module shall be capable of providing reactive power automatically by voltage control mode, reactive power control mode, power factor control mode or active power-related power factor control mode in accordance with viii.</p> <p>(viii) The relevant system operator, in coordination with the relevant TSOs, shall specify which of the above four power control mode options and associated setpoints is to apply, and in coordination with the power park module owner, shall specify what further equipment is needed to make the adjustment of the relevant setpoint or to change the applied reactive power control mode operable remotely;</p>

Article 21(3)	ENTSO-E has investigated an alternative legal text proposal for the forced oscillations requirement of PPMs, starting from type C. Please see the attached word document for the legal text proposal.	The legal text was added to the word document.
Article 21(4)		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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## Requirements for type D power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new paragraphs

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 22(1)		
Article 22(2)	ENTSO-E recommends that POD for type D PPM is also required for type C PPM.	

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New provision	

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## TITLE II CHAPTER 4 - Requirements for offshore power park modules

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 23	ENTSO-E would like to ask to ACER to make sure that the Grid forming requirements are linked to the offshore power parks. It is important that the AC connected PPMs have grid forming as well.	
Article 24		
Article 25	(1) ENTSO-E supports ACER approach but recommends that voltage ranges below 110kV cover at least from 0.85 to 1.1 (in line with end points of FRT and HVRT profiles) instead of leaving these fully non-exhaustive.	
Article 26	ENTSO-E has investigated an alternative legal text proposal for the forced oscillations requirement of PPMs, starting from type C. Please see the attached word document for the legal text proposal.	The legal text was added to the word document.
Article 27		
Article 28		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## TITLE III - Operational notification procedure for connection

Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new articles

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 29	ENTSO-E would like to propose that in Art 29.3 the competent authority of the Member State should as well ensure that such notification can be made by third parties, including aggregators.	
Article 30		
Article 30a [new]		
Article 30b [new]		
Article 31		
Article 32		
Article 33		
Article 34		
Article 35		
Article 36		
Article 37		
Article 38		
Article 39	ENTSO-E recommends to clearly distinguish the confusion between operational emergency and restoration procedures (refers to in the article 59.2. a of the EU regulation of internal market) and a connection code looking at the MT and LT future. Some capabilities shall be required in the CNC even if these capabilities are not currently used in operational emergency and restoration procedures but there is an expected need of having these capability for the future operation of the power system.	

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## TITLE IV - Compliance

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 40		
Article 41		
Article 42		
Article 43		
Article 44	<p>After several discussions between ENTSO-E and EG HCF on the need for introducing in the legal text relevant topics regarding the certification process of PGMs, ENTSO-E's initial position was leaving this topic entirely to a new IGD or modify the existing ones on compliance; However, due to the persistence of EG HCF in including a lot of wording related to the certification process in the legal text (equipment certificates, compliance schemes), ENTSO-E's position is that the level of detail to be introduced in the legal text regarding certification process should be very general, and the details should be defined at national level in order to not interfere with existing, or under development, processes in the Member States that are following such approach for the compliance process of PGM with RfG requirements. In such situation, ENTSO-E's proposal would be to introduce a new article called "common provisions on equipment certificates" in the Chapter 1 "Compliance Monitoring" under Title IV "Compliance" with the motivation of: 1) State the need for specifying a compliance scheme, in case the RSO decides to</p>	<p>The legal text was added to the word document.</p>

	<p>use equipment certificates ; 2) possibility of mutual recognition of equipment certificates between MS, and 3) possibility of issuing certificates for power generating units or components that belong to a family. ENTSO-E would like to have the proposed legal text in the new Article 44 under Title IV, Chapter 1, however, the proposed legal text was added to the new Article 41a in order not to violate the order of all articles. Apart from this new article, there is a need for new definitions related to certification process.</p>	
Article 45		
Article 46		
Article 47		
Article 48	<p>(4)(a) ENTSO-E recommends to remove the part "depending on the energy stored" as this is not relevant for this particular article.</p>	<p>(4)(a) In the case of an electricity storage module, the full operating range, is between maximum consumption capacity and maximum capacity.</p>
Article 49		
Article 50		
Article 51		
Article 52	<p>(2)(a) ENTSO-E suggest to leave the decision to include RMS simulations at national level based on existing practices.</p> <p>(5)(a) ENTSO-E position is that the real PQ capabilities of PGM based on generating units Qmax an Qmin are simulated.</p>	<p>(2)(a) the power-generating module's capability to modulate active power at low frequencies in accordance with point (c) of Article 15(2) shall be demonstrated;</p>
Article 53		

Article 54		
Article 55		
Article 56		
Article 57		
Article 58		
Article 59		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## TITLE V - Derogations

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 60		
Article 61		
Article 62		
Article 63		
Article 64		
Article 65		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## **[DELETED]** TITLE VI - Transitional arrangements for emerging technologies

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Title VI [deleted]		



Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 70a [new]	<p>"The whereas 32, as given by the proposal of ACER should be included in article 70a (Repeal), as it is not considered a transitional provision. Moreover, the wording is not precise enough regarding the modifications which makes the PGM fall within the scope of application of the regulation. For example, necessary to give more details for the case of new PGMs that will arrive after the entry into force of the this regulation and before the date on which the requirements it provides begin to apply (to avoid that none of the NC apply to them). Introducing new requirements without specifying their temporal application (scope ratione temporis) entails the risk of legal uncertainty for PGMs, which existed already before the entry into force of the newly adopted regulation, due to its retroactive application. 2, This should be included in article Repeal, as it is not considered a transitional provision. Moreover, the wording is not precise enough regarding the modifications which makes the PGM fall within the scope of application of the regulation.</p> <p>For example, necessary to give more details for the case of new PGMs that will arrive after the entry into force of the this regulation and before the date on which the requirements it provides begin to apply (to avoid that none of the NC apply to them). "</p>	<p>1. Notwithstanding Article 71a, Commission Regulation (EU) 2016/631 shall continue to apply to power-generating modules which fall within its the scope of application at the entry into force of this Regulation.</p> <p>2. This Regulation establishes requirements which go beyond those of Commission Regulation (EU) 2016/631 of 14 April 2016 and could burden existing power generating modules significantly, if applicable to them. To ensure that this burden does not materialize, those requirements should not apply to power-generating modules existing at the entry into force of this Regulation or to those where the power-generating facility owner has concluded a final and binding contract for the purchase of the main generating plant by two years after the entry into force of this Regulation. Instead, the requirements under Commission Regulation (EU) 2016/631 should continue to apply to the power-generating modules which exist at the entry into force of this Regulation and fall within the scope of Commission Regulation (EU) 2016/631.</p>

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## TITLE VII - Final provisions

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Please write your comments on the ACER draft amendments and your alternative text proposals, if any, in the table below

Includes new articles

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 71		
Article 71a [new]	ENTSO-E would like to propose a reviewed legal text for the Art. 71a in order to ensure clarity.	2. Notwithstanding paragraph 1 of this Article, and without prejudice to points (a) and (b) of Article 4 (1) of this Regulation, the requirements of Regulation (EU) No 2016/631 shall remain applicable to new power generating modules as understood by said Regulation (EU) No 2016/631 and to existing power generating modules as understood by said Regulation (EU) No 2016/631, also in case the latter have undergone substantial modernisation or have been subject to a decision by the regulatory authority on the basis of point (a), respectively (b) of Article 4 (1) of Regulation (EU) No 2016/631.
Article 72		

Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
New article	

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## Other additional provisions

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Please write your amendment proposals, if any, in the table below

	Text amendment proposal (if applicable)
Other new provisions	

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## Background Documents

[NC\\_RfG\\_ACER\\_draft\\_amendments\\_for\\_PC\\_2023\\_E\\_07.docx](#)

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