

# 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')**.

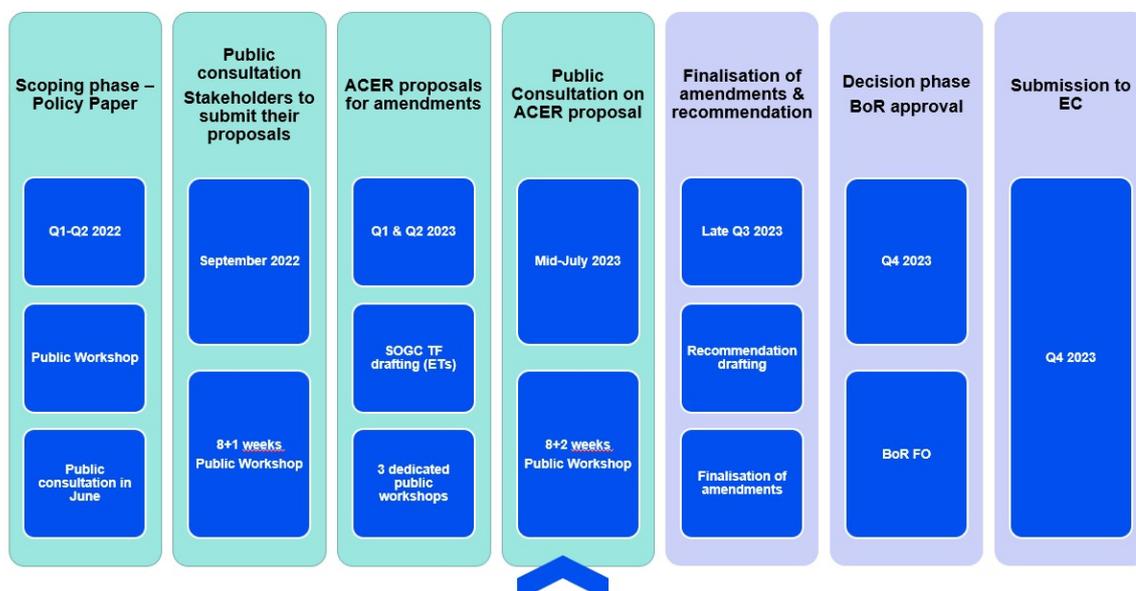
For draft amendments concerning Network Code on Demand Connection ('NC DC'), please go to the respective form: [NC DC](#).

**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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ACER is highly committed in processing personal data in a lawful way.

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

\* Name of the stakeholder:

Iberdrola S.A.

\* Contact person:

[REDACTED]

\* Contact person's email address:

[REDACTED]

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

Spain

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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

**512b949b-38ca-473f-b160-48c8aa8460a2/ACER\_draft\_RfG\_stakeholder\_Iberdrola.docx**

**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.

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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)		
(s2)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)	<p>PPMs shall be assessed based on the (contractually) agreed maximum active power export capacity at their connection point, no matter what technologies and primary energy sources they are using inside the PPM.</p> <p>Hybrid power plants should be covered. For example, Wind + storage, Wind+PV + Storage, Hydro+Wind, Hydro+PV, Hydro+Storage, CCGT+storage, etc. Hybrid Power plant are going to be a reality in the coming years.</p>	<p>Non-synchronously connected power-generating units of the any underlying technology and any primary energy source, where they are collected together to form an economic unit towards the RSO and where they have a single connection point to the RSO, shall be assessed based on the agreed maximum continuous active power export capacity at the point of connection, irrespective of their installed aggregated capacity.</p>
(10)		
(**)		
(11)		
(12)		

(13)		
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(25)		
		<p>Rapidly increasing penetration of dispersed generation and converted-based technologies into European networks has presented new challenges in ensuring overall system security. To the extent that an adequate contribution to the dynamically transforming system depends partly on advanced capabilities, power-generating modules should be able to support the system robustness by fulfilling appropriate grid-forming and rate-of-change-of-frequency withstand requirements. The regulator shall consider if such advanced capabilities are to be provided as in accordance with mandatory requirements, or if some of these shall be provided as ancillary services according to EU</p>

(**)	<p>Power plants, Hybrid power plants, storage are going to participate in the stability of the system through different services. These services should have a remuneration according to EU directives</p> <p>Markets for services such as Voltage Control, P /F control, Inertia and Grid Forming should be defined.</p> <p>Markets for services such as Voltage Control, P /F control, Inertia and Grid Forming should be defined.</p>	<p>directive 2019/944 of 5 June 2019. Those capabilities to be provided as in accordance with mandatory requirements shall be supported by a full, publicly consulted cost-benefit analysis. Rapidly increasing penetration of dispersed generation and converted-based technologies into European networks has presented new challenges in ensuring overall system security. To the extent that an adequate contribution to the dynamically transforming system depends partly on advanced capabilities, power-generating modules should be able to support the system robustness by fulfilling appropriate grid-forming and rate-of-change-of-frequency withstand requirements. The regulator shall consider if such advanced capabilities are to be provided as in accordance with mandatory requirements, or if some of these shall be provided as ancillary services according to EU directive 2019/944 of 5 June 2019. Those capabilities to be provided as in accordance with mandatory requirements shall be supported by a full, publicly consulted cost-benefit analysis.</p>
(26)		
(27)		
(28)		
(29)		
(30)		
(31)		
(32)		

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)		

Article 2(16)		<p>'maximum capacity' or 'Pmax' means the maximum continuous active power which a power-generating module can export while all units are available, less any demand or losses associated solely with facilitating the operation of that power-generating module as specified in the connection agreement or as agreed between the relevant system operator and the power-generating facility owner, or determined by other appropriate means, where an agreement is not required and which may differ from the aggregated installed capacity of a power-generating module.</p> <p>Electricity storage integrated to a power-generating module should be considered as part of such module while its capacity should not count towards the power-generating module capacity, unless the connection agreement is modified by the PGFO (Power generator facility owner).</p> <p>Electricity storage integrated to a power-generating module should be considered as part of such module while its capacity should not count towards the power-generating module capacity, unless the connection agreement is modified by the PGFO (Power generator facility owner).</p>
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<p>Article 2(17)</p>	<p>As the Hybrid power plant has not been defined in this RfG , the PPM needs a revision in order to covered with these Hybrid power plants. Perhaps a Hybrid power plant should be defined in this RfG. This definition could bring advantages and clarity to the differences between PPM and Hybrid power plant. Perhaps a Hybrid power plant should be defined in this RfG. This definition could bring advantages an clarity to the differences between PPM and Hybrid power plant.</p>	<p>‘power park module’ or ‘PPM’ means a unit or ensemble of units of the same or different technologies that can exporting electrical energy or importing in case of storage modules... which is not a synchronous power-generating module and which is either non-synchronously connected to the network or connected through power electronics, and that also has a single connection point to a transmission system, distribution system including closed distribution system or HVDC system. A PPM could have part of another PPM if this PPM have a coordinated control to behave as single plant.</p>
<p>Article 2(18)</p>		
<p>Article 2(19)</p>		
<p>Article 2(20)</p>		
<p>Article 2(21)</p>		
<p>Article 2(22)</p>		
<p>Article 2(23)</p>		
<p>Article 2(24)</p>		
<p>Article 2(25)</p>		
<p>Article 2(26)</p>		
<p>Article 2(27)</p>		
<p>Article 2(28)</p>		
<p>Article 2(29)</p>		
<p>Article 2(30)</p>		

Article 2(31)		
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Article 2(36)		
Article 2(37)		
Article 2(38)		
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Article 2(60)		
Article 2(61)		
Article 2(62)		
Article 2(63)		
Article 2(64)		
Article 2(65)		
Article 2(66)		
Article 2(67)	The relation between ESM and PPM should be clarify.	<p>'electricity storage module' or 'ESM' means a synchronous power-generating module or a power park module which can inject and consume active power to and from the network for electricity storage, excluding pump-storage power-generating modules. A V2G electric vehicle and associated V2G electric vehicle supply equipment with a bidirectional functionality is regarded as an electricity storage module. Electricity storage integrated to a power-generating module should be considered as part of such module while its capacity should not count towards the power-generating module capacity, unless the connection agreement is modified by the PGFO (Power generator facility owner).</p>
Article 2(68)		
Article 2(69)		
Article 2(70)		
Article 2(71)		
Article 2(72)		
Article 2(73)		

Article 2(74)		
Article 2(75)	This the energy accumulated for example in a WTG in its own kinetic energy.	'Inherent energy storage' means an amount of energy reserve, expressed in MWs or MWh, available in physical components of a PPM, as determined by the power-generating facility owner.

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

	Text amendment proposal (if applicable)
New definition	<p>It is compulsory to have clear and unique definition of Grid forming for all countries. This definition must be an exhaustive one.</p> <p>It is important to highlight that the grid forming has been tested in a few individual power plants, Iberdrola performed a Grid Forming test with SGR in Dersaloch WF (UK) in 2020, but nobody has tested several power plants working as a Grid Forming. So how is going to be the impact in the electrical network has not been test so far.</p> <p>Def. to be added (copied) for generic models and user written models from the standards (if there are any)</p>

Please upload figures or tables if necessary

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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 table below

Includes new articles

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 1		
Article 3		
Article 4		
	<p>TO DELETE (b) (c)</p> <p>The inclusion of (b) and (c) of the original text will potentially hamper any possibility to improve technical capabilities of existing, old PPMs:</p> <ul style="list-style-type: none"> <li>• Installing external compensation solutions (e.g. a STATCOM at the PPM substation) to allow /or to enhance participation of a PPM in ancillary services such as voltage control.</li> <li>• Improving active power management capabilities (e.g. enabling active power control by blade-pitching or advance PPC function) to allow participation in ancillary services such as secondary frequency control.</li> </ul> <p>If doing this means that the existing, old PPMs needs to comply with the new requirements (e.g. being grid-forming capable, RoCoF,...), PPM owners will regrettably discard participating in these markets, and TSOs will loss a significant number of potential ancillary service providers already connected in their grids.</p> <p>In addition, deployment of hybrid power plants will be also impacted since a new PPM forming a</p>	<p>1. Proposals for defining significant modernisation of power-generating modules and the requirements applicable in those cases shall be subject to approval by the relevant regulatory authority or, where applicable, the Member State. In developing the proposals, the TSO shall coordinate with relevant DSOs and conduct a public consultation in accordance with Article 10.</p> <p>2. The definition of significant modernisation shall take into account at least the following criteria:</p> <p>(a) an increase above the existing maximum capacity of the power-generating module, whether this increase results from one modernisation or several successive modernisations, of a minimum percentage to be defined 20% and above (within this range, different percentages may be defined for different technologies depending on their constraints);</p> <p>(b) DELETE</p> <p>(c) DELETE</p> <p>(d)</p>

<p>Article 4a [new]</p>	<p>hybrid installation with an existing PPM, subsequently changes the capabilities of the existing PPM.</p> <p>(4d) Maintenance and repair activities and spare parts are not to be subject of significant modernisation, whether or not those parts are purchased new at the time of their incorporation in the power generating module.</p> <p>This criterion has been already well defined by some Member States.</p> <p>In Spain, for instance, significant modernisation has been defined as change of the main generating plant in a percentage higher than 70% of the installed capacity, as per Royal Decree RD 647/2020.</p> <p>This same RD provides a clear definition for main generating plant according to the specific technology components of SPMG and PPM (wind and PV).</p> <p>The NC shall take this as relevant reference and procure some degree of harmonisation in Member State.</p> <p>To be deleted. This requirement should be exhaustive.</p>	<p>(d) a change of main generating plant of a power-generating module or electricity storage module a in a percentage above 70%.</p> <p>For the purposes provided for in this article, the main generating plant will be understood as:</p> <p>a) In the case of synchronous power generation modules, the assembly formed by the prime mover and the alternator.</p> <p>b) In the case of power park modules, the assembly formed by the inverter and the power generating unit, if the latter has a relevant impact on the technical capabilities of the power park module.</p> <p>In wind power park modules, the wind turbine will be considered as the power generating unit, which, for these purposes, will be understood as the assembly formed by the tower, the blades and the nacelle.</p> <p>In PV power park modules, only the inverter will be considered the main generating plant, while the equipment or components of the direct current side will not be considered as part of the main generating plant.</p> <p>2. DELETE</p>
<p>Article 5</p>		
<p>Article 6</p>		

Article 7	It is important to know that the TSO has to publish the non-exhaustive requirements in each country. Apart from that, it is necessary a validation plan and a few entities available to generate the certification needed to get the FON.	The relevant system operator or TSO shall submit a proposal for requirements of general application, and the methodology used to calculate or establish them, and an implemented validation scheme, for approval by the designated entity. The regulation entry into force within three years, once this proposal, the validation scheme and the countries define the entities will be defined.
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	

Please upload figures or tables if necessary

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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)		
Article 13(3)		
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)		
Article 13(13)		
Article 13(14)		

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

	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)		
Article 13a(2)		
Article 13a(3)		
Article 13a(4)		
Article 13a(5)		
Article 13a(6)		
Article 13a(7)		
Article 13a(8)		
Article 13a(9)		
Article 13a(10)		
Article 13a(11)		

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

	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)	“Electric vehicles and recharging infrastructure are new players in the context of this RfG, with specific issues and constraints. The implications of integration and concluding the most appropriate way to operate it requires an extended time horizon”.	
Article 14(2)[deleted]		
Article 14(2)		

<p>Article 14(3)</p>	<p>At connection points where multiple plants are connected and with long connection lines, this requirement is not possible to comply with. This configuration is very popular in SPAIN.</p> <p>There shall be and exception on this kind of configurations.</p> <p>The Q injection/consumption in this configuration, does not have too much influence in the CP. For this reason, it does not make sense to try to regulate Voltage in CP, demanding Q to the power plants downstream. It would make sense that the owner of the CT, usually the local TSO, installs the devices to control, the voltages in the CT point.</p> <p>There shall be and exception on this kind of configurations.</p> <p>The Q injection/consumption in this configuration, do not have too much influence in the CP. For this reason, it does not make sense to try to regulate Voltage in CP, demanding Q to the power plants downstream. It would make sense that the owner of the CT, usually the local TSO, installs the devices to control, the voltages in the CT point.</p>	<p>(c) The power-generating module shall be capable of operating stably without disconnecting from the network, if none of the phase-to-phase voltages exceeds the voltage-against-time-profile defined in Figure X at the connection point.</p>
<p>Article 14(4)</p>		

Article 14(5)	Metering device and communication link shall be defined	d(ii) power-generating facilities shall be capable of exchanging real time data for metering with the relevant system operator or the relevant TSO.
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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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**[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)		Electric vehicles are a new player in this RfG, so it is necessary to require an time extension to study the implications in a properly way.
Article 14a(2)		
Article 14a(3)		
Article 14a(4)		
Article 14a(5)		
Article 14a(6)		
Article 14a(7)		
Article 14a(8)		

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

	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)		
Article 15(2)		
Article 15(3)[deleted]		
Article 15(3)		
Article 15(4)		
Article 15(5)		

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

	Text amendment proposal (if applicable)
New provision	

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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)		
Article 16(4)		

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

	Text amendment proposal (if applicable)
New provision	

Please upload figures or tables if necessary

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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		

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

	Text amendment proposal (if applicable)
New provision	

Please upload figures or tables if necessary

The maximum file size is 1 MB

Please upload figures or tables if necessary

The maximum file size is 1 MB

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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)		

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)		

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)		

<p>Article Y(5)</p>	<p>A specific process must be design at this level defining under which circumstances the TSO may require grid forming capabilities. A, B, C and D generator should know in advance if the plant is going to need grid forming or not. It is not clear in the literature if demanding to even type A generators grid forming capabilities is advantageous or detrimental. Additionally, be aware that, in order to provide grid forming capabilities, reverse current flows must be tolerated.</p> <p>A specific process must be design at this level defining under which circumstances the TSO may require grid forming capabilities. A, B, C and D generator should know in advance if the plant is going to need grid forming or not. It is not clear in the literature if demanding to even type A generators grid forming capabilities is advantageous or detrimental. Additionally, be aware that, in order to provide grid forming capabilities, reverse current flows must be tolerated.</p>	<p>The relevant TSO in coordination with the relevant system operator SHALL TECHNICALLY JUSTIFY that power park modules shall be capable of providing grid forming capability at the connection point. The relevant TSO in coordination with the relevant system operator SHALL TECHNICALLY JUSTIFY that power park modules shall be capable of providing grid forming capability at the connection point.</p>
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<p>Article Y(6)</p>	<p>It seems a short time to implement a mandatory requirement as Grid Forming because it is not yet a mature development.</p> <p>Grid Forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large scale deployment. State of the art is not yet mature. RfG 2.0 should not eliminate grid following technologies until Grid Forming is demonstrated by stakeholders (industry, TSO/RSO, Academia, etc).</p> <p>Grid Forming requirements are not yet exhaustively defined and therefore not properly modelled and tested for a large scale deployment. State of the art is not yet mature. RfG 2.0 should not eliminate grid following technologies until Grid Forming is demonstrated by stakeholders (industry, TSO/RSO, Academia, etc).</p>	<p>Y.6(b) The power-generating facility owner has concluded a final binding contract for the purchase of the main generating plant by three years after the entry into force of the Regulation</p>
<p>Article Y(7)</p>		
	<p>It is needed a clear definition of Grid Forming.</p> <p>The term individual unit is not defined in the document. The proposal is to remove “at the terminals of the individual unit(s)”. This can be provided either by the PPM itself or dedicated storage units within the PPM.</p> <p>If the conditions of the plant change and there is</p>	

Article Y(8)

no primary resource, the capabilities of the PPM could change.  
To be deleted. Different parameters shall be carefully analyzed to check the affection to stability.

It is not clear if this activation/deactivation must be performed live, at the factory before installation, or if it will be possible to switch off the plant with an idle time. This switch in the operating mode may lead to a loss in production and should be limited in number.

This could lead also to have double products and to perform double certification and double testing of the PPM (grid forming-grid following) and components. Not feasible for solar Power plants as they shall be design with a capacity that could be unused.

With regard to grid forming capability, if JUSTIFIED by the relevant TSO , If grid forming mode capability is required, the power park module shall be capable of providing grid forming capability at the connection point as listed below. The power park module shall have the capability to activate or deactivate grid-forming mode both through settings and through external input in real time

- (a) A power park module shall be capable of providing grid forming capability at the connection point if the primary resource is available as listed below:
- c)(i) DELETED

(8)(d) The power park module shall have the capability to activate or deactivate grid-forming mode.

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)	The grid forming technology in high scale installation is not yet adequately tested. Grid forming capabilities cannot be provided by all standard PPM, it shall be choose depending of each specific node, such capabilities shall have been specified by the TSO or not, as stated in article Y point 5. Both technology grid following and grid forming shall be kept	1. Type B power park modules shall fulfil the requirements laid down in Article 13, Article 14, and Article Y (5), (6), (7) and (8), except for Article 13(2)(b) and Article 13(8). Requirement laid down in Article Y(8)(d) shall not apply to power park modules with maximum capacity larger than or equal to 10 MW.
Article 20(2)		
Article 20(3)		
Article 20(4)	The grid forming technology in high scale installation is not yet adequately tested. Grid forming capabilities cannot be provided by all standard PPM, it shall be chosen depending of each specific node, such capabilities shall have been specified by the TSO or not, as stated in article Y point 5. Both technology grid following and grid forming shall be kept	With regard to grid forming capability, if JUSTIFIED by the relevant TSO ....

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)	The grid forming technology in high scale installation is not yet adequately tested. Grid forming capabilities cannot be provided by all standard PPM, it shall be choose depending of each specific node, such capabilities shall have been specified by the TSO or not, as stated in article Y point 5. Both technology grid following and grid forming shall be kept	1. Type C power park modules shall fulfil the requirements listed in Article 13, Article 14, Article 15, Article Y (5), (6), and (8)
Article 21(2) [deleted]	this part need to be maintained, in particular for the grid following.	
	<p>In Spain for instance, the national legislation since Royal Decree 2818/1998 (later superseded by RD 436/2004 and RD 661/2007) imposes obligation for a PPM owner to share its electrical infrastructure (up to the point of connection) with other owners whose PPM connect to the same point of connection. Hence, forming a shared connection grid.</p> <p>Said shared connection grids have existed for +20 years in Spain, and over these years neither the relevant authorities nor the TSO/RSO, at the time of authorising the connection of PPMs via a shared connection grid, have never impose any requirement for supplementary reactive power.</p> <p>If this requirement is not delimited, for existing PPMs in one of this shared connection grids means a retroactive application of NC requirements and co-</p>	a) with regard to reactive power capability, the relevant system operator may specify supplementary

Article 21(2)

financing the grid connection costs of new PPM connected to the same shared connection grids. If apply to new PPMs only, a new PPM would bear over-costs derived from the need to over-compensate electrical infrastructure beyond what is needed for the evacuation of its maximum capacity.

In consequence, under these circumstances, it shall be the TSO/RSO responsible for procuring the supplementary reactive power to compensate the reactive power demand of said shared connection grids and their evolution over the time. To this end, the TSO/RSO shall make use of reinforcements via grid planning, use existing compensation equipment of their own or procure reactive power ancillary services (remunerated) by PPMs within said shared connection grid.

The Reactive power range  $\pm 0,2$ , is very important since this reactive power is going to be provided by WTGs or converters in a PPM. These units are very fast so they can cope with the range 1-5 second. For reactive power out of that range, the PPM could need external devices such as capacitors or reactors. To fix  $t_1=60$  seconds for these devices, it is because lower time ranges are impossible to fulfill.

reactive power to be provided if the connection point of a power park module is neither located at the high-voltage terminals of the step-up transformer to the voltage level of the connection point nor at the convertor terminals, if no step-up transformer exists. This supplementary reactive power shall compensate the reactive power demand of the high-voltage line or cable between the high-voltage terminals of the step-up transformer of the power park module or its convertor terminals, if no step-up transformer exists, and the connection point and shall be provided by the responsible owner of that line or cable.

This requirement is not applicable in those cases where the national legislation imposes obligations for several power park modules, even when they are from different owners, to use and share the same electrical infrastructure up to the point of connection, and additional supplementary reactive power has not been requested by the relevant Authority when authorizing this shared use.

(iv) following a step change in voltage, the power park module shall be capable of achieving 90 % of the change in reactive power output within a time  $t_1$  to be specified by the relevant system operator in the range of 1 to 5 seconds for a reactive power range of  $\pm 0,2$ , and must settle at the value specified by the slope within a time  $t_2$  to be specified by the relevant system operator in the range of 5 to 60 seconds, with a steady-state reactive tolerance no greater than 5 % of the maximum reactive power. For ranges out of  $\pm 0,2$ ,  $t_1=60$  seconds. The relevant

	<p>Said shared connection grids have existed for +20 years in Spain, and over these years neither the relevant authorities nor the TSO/RSO, at the time of authorising the connection of PPMs via a shared connection grid, have never impose any requirement for supplementary reactive power.</p> <p>If this requirement is not delimited, for existing PPMs in one of this shared connection grids means a retroactive application of NC requirements and co-financing the grid connection costs of new PPM connected to the same shared connection grids. If apply to new PPMs only, a new PPM would bear over-costs derived from the need to over-compensate electrical infrastructure beyond what is needed for the evacuation of its maximum capacity.</p> <p>In consequence, under these circumstances, it shall be the TSO/RSO responsible for procuring the supplementary reactive power to compensate the reactive power demand of said shared connection grids and their evolution over the time. To this end, the TSO/RSO shall make use of reinforcements via grid planning, use existing compensation equipment of their own or procure reactive power ancillary services (remunerated) by PPMs within said shared connection grid.</p>	<p>system operator shall specify the time specifications</p> <p>This requirement is not applicable in those cases where the national legislation imposes obligations for several power park modules, even when they are from different owners, to use and share the same electrical infrastructure up to the point of connection, and additional supplementary reactive power has not been requested by the relevant Authority when authorizing this shared use.</p>
Article 21(3)		

Article 21(4)	The grid forming technology in high scale installation is not yet adequately tested. Grid forming capabilities cannot be provided by all standard PPM, it shall be chosen depending of each specific node, such capabilities shall have been specified by the TSO or not, as stated in article Y point 5. Both technology grid following and grid forming shall be kept	With regard to grid forming capability, if JUSTIFIED by the relevant TSO ....
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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 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)	<p>The grid forming technology in high scale installation is not yet adequately tested. Grid forming capabilities cannot be provided by all standard PPM, it shall be choose depending of each specific node, such capabilities shall have been specified by the TSO or not, as stated in article Y point 5. Both technology grid following and grid forming shall be kept</p>	<p>“Type D power park modules shall fulfil the requirements listed in Article 13, Article 14, Article 15, Article Y (5), (6) and (8), Article 20, and Article 21....”</p>
Article 22(2)	<p>Oscillations damping control is not yet a standard control for all type of PPM. It should remain a voluntary requirement or an agreement with relevant TSO.</p>	<p>“With regard to power oscillations damping control, if specified by the relevant TSO, type D power park modules shall have a power oscillation damping function which helps to attenuate the power oscillations through the control of the active power, reactive power, or both.....”</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 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		
Article 24		
Article 25		
Article 26		
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		
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		

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		
Article 45		
Article 46		
Article 47		
Article 48		
Article 49		
Article 50		
Article 51		
Article 52		
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]		

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]		
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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