

# ACER draft amendments to the Network Code on HVDC

Fields marked with \* are mandatory.

## Introduction

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This consultation aims at presenting ACER's draft amendments to the **Commission Regulation (EU) 2016 /1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules ('NC HVDC')**.

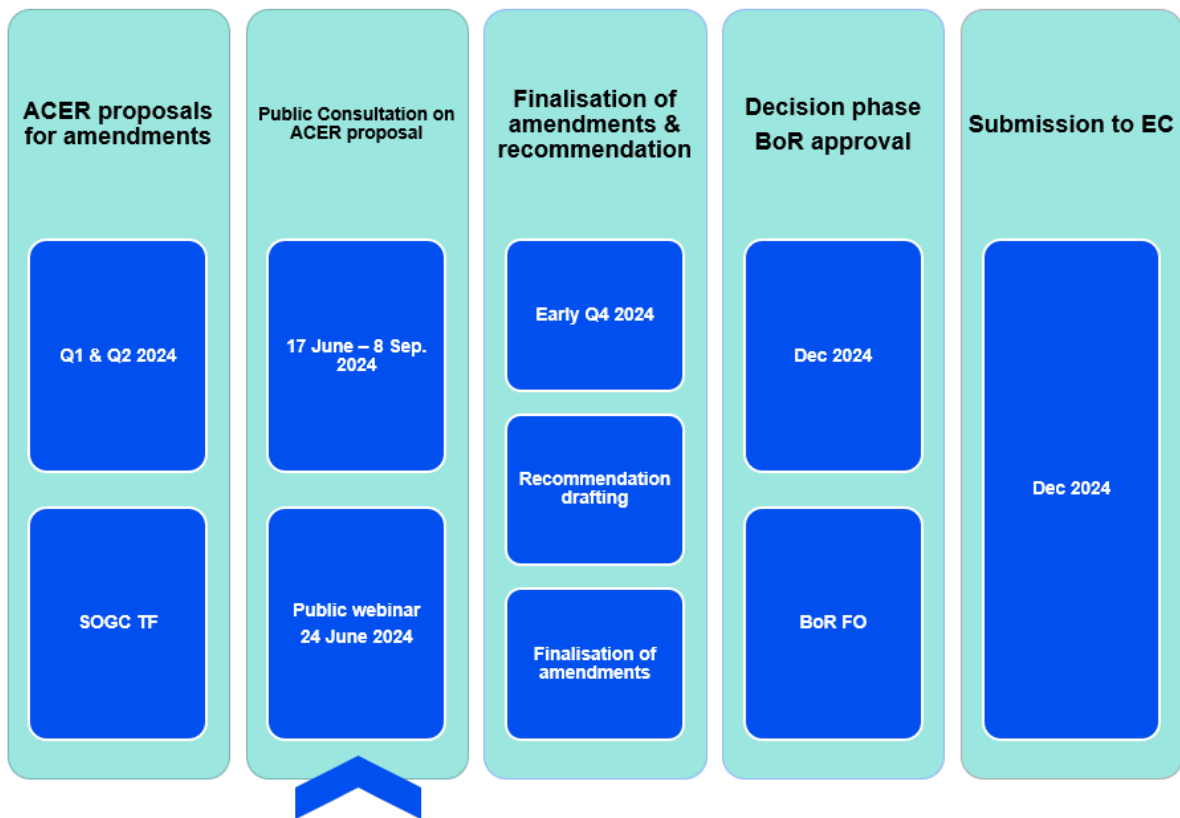
**Responses to this consultation should be submitted by 8 September 2024.**

## 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 to the NC HVDC, as presented to the GC ESC is outlined in the Figure below:





In the context of [the ongoing revisions of the European grid connection network codes](#), ACER will consult with stakeholders to collect views on ACER's concrete amendment proposals to the network code on grid connection requirements for high voltage direct current systems and related power park modules ([NC HVDC](#) ).

The revisions to the NC HVDC aim to:

- Enhance the existing grid connection regulatory framework.
- Align the code with the [ACER Recommendation](#) on reasoned proposals for amendments to the network codes on requirements for grid connection of generators and on demand connection.
- Ensure the interconnected system is adapted to emerging trends, such as the increasing generation capacity of offshore networks (AC hubs) and the connection of new system users (storage, demand facilities, including power-to-gas demand units).

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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:

EDF



\* Contact person:

\* Contact person's email address:

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

\* 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 HVDC articles** amended by ACER in three mandatory steps:

1. download the ACER draft amendments in the Word file provided below. The file could also be accessed on the right panel of the consultation form under the Background Documents;
2. comment on the ACER's draft amendments through this online consultation form and adding your alternative text proposals to the table, if any; and
3. uploading the alternative amendment proposals to the **entire NC HVDC** document 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 could also be accessed on the right panel of the consultation form under the Background Documents.

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

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## ***Step 2***

**Kindly note that this consultation form follows the structure of the NC HVDC 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	<b>1</b>	<b>2</b>
Article 3		
Article 4		
Article 5		
Article 6		
Article 7		
Article 8		
Article 9		
Article 10		

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

	Text amendment proposal (if applicable)
New article	<b>3</b>

Please upload figures or tables if necessary 

The maximum file size is 1 MB

Select file(s) 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 HVDC, 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 HVDC**, 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\_HVDC\_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 HVDC 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

**1064bc2a-e113-4334-bd5c-01db25a98b93/ACER\_draft\_\_HVDC\_stakeholder\_EDF.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.

Please upload your file

The maximum file size is 1 MB

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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 HVDC Whereas section, including new recitals

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
(1)		
(2)		
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		
(11)		
(12)		
(13)		
(14)		
(15)		
(16)		
(17)		
(18)		
(19)		



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)[deleted]		
Article 2(2)		
Article 2(3)		
Article 2(5)[deleted]		
Article 2(6)[deleted]		
Article 2(4)		
Article 2(5)		
Article 2(6)		
Article 2(7)		
Article 2(8)[NEW]		
Article 2(9)[NEW]		
Article 2(10)[NEW]		
Article 2(11)[NEW]		
Article 2(12)[NEW]		
Article 2(13)[NEW]		
Article 2(14)[NEW]		
Article 2(15)[NEW]		
Article 2(16)[NEW]		
Article 2(17)[NEW]		
Article 2(18)[NEW]		



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

	Text amendment proposal (if applicable)
New definition	

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	Precision to avoid the understanding that it could apply on the private owner side of the system	1.The requirements of this Regulation shall apply to the AC side of HVDC systems on the transmission network :
Article 4		
Article 5		
Article 6		
Article 7		
Article 8		
Article 9		
Article 10		



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

The maximum file size is 1 MB

## TITLE II - GENERAL REQUIREMENTS FOR HVDC CONNECTIONS

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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 11		
Article 12	<p>EDF suggests to realign the requirements for the RoCoF profile with the one defined in RfG 2.0 for power park modules, with respectively 4 Hz/s during 0.25s then 2 Hz/s during 0.5s, 1,5 Hz/s during 1s, 1,25 Hz during 2s</p> <p>EDF proposes to erase the new requirement regarding the 52 Hz-52,5 Hz frequency range. It is not justified and was initially only created to take into account the new Rocof profile in the overfrequency range. No real analysis was performed about it. Requirements should be set after a robust justification of system needs, be subject to cost-benefit analysis (because they can imply huge costs for generators and deter investment) and after assessment of alternative network solutions.</p>	<p>To replace values with :</p> <p>±4,0 Hz/s over a period of 0,25 s,  ±2,0 Hz/s over a period of 0,5 s,  ±1,5 Hz/s over a period of 1 s, and  ±1,25 Hz/s over a period of 2 s;</p>
Article 13		
Article 14		
Article 15		
Article 16		
Article 17		
Article 18		
Article 19		
Article 20		
Article 21		
Article 22		



Article 23		
Article 24		
Article 25		
Article 26		
Article 27		
Article 28		
Article 29	<p>29(1) The study shall be mandatory and not optionnal as it is needed to demonstrate that no adverse interaction will occur</p> <p>29(2) The TSO should be in charge to carry out the study to ensure its exhaustiveness and its impartiality, and therefore should not be carried out by the HVDC system owner. The TSO has the detail knowledge of the network in the area of the project and of the characteristics and constraints of the users in the vicinity.</p> <p>EDF also considers that the risk that the TSO could be biaised in a situation where the TSO is also the owner of the HVDC system is limited.</p> <p>In any case, it would be possible to request the designation of an independent technical expert :</p> <ul style="list-style-type: none"> <li>- by the NRA,</li> <li>- or by the TSO with the approval of the NRA, in accordance with a TSO process previously approved by the NRA.</li> </ul> <p>29(4) / 29(5) 29(6) : As the TSO shall be responsible to carry out the study, there is no need for an assessment, a review or a replication</p>	<p>1. When several HVDC converter stations or other plants and equipment are within close electrical proximity, the relevant TSO shall specify that a study is required,</p> <p>2. The studies shall be carried out by the TSO with the participation of the connecting HVDC system owner and of all other parties identified by the TSOs as relevant to each connection point. The HVDC system owner shall provide the relevant TSO all relevant data and models that allow such study to be performed. All parties shall be informed of the results of the studies.</p> <p>4. To be deleted</p>



	<p>29(7) : As the HVDC system owner is responsible for the possible impacts of its project in the area of "electrical proximity", he should cover the costs associated to the study</p>	<p>5.to be deleted</p> <p>6.(New 4). Any necessary mitigating actions identified by the studies carried out in accordance with paragraphs 2 to 5 shall be undertaken by the HVDC system owner as part of the connection of the new HVDC converter station.</p> <p>7.(New 6). The cost associated with the studies carried out by the TSO shall be borne by the HVDC owner.</p>
Article 30		
	<p>31(2) To ensure exhaustiveness and impartiality, the study should be carried out by the TSO, and the HVDC system owner shall answer to the request of the TSO regarding information to perform the study. The TSO has the detail knowledge of the network in the area of the project and of the characteristics and constraints of the users in the vicinity</p> <p>EDF also considers that the risk that the TSO could be biased in a situation where the TSO is also the owner of the HVDC system is limited.</p> <p>In any case, it would be possible to request the designation of an independent technical expert :</p> <ul style="list-style-type: none"> <li>- by the NRA,</li> <li>- or by the TSO with the approval of the NRA, in accordance with a TSO process previously</li> </ul>	<p>2. The relevant TSO shall specify the scope and extent of SSTI studies and provide input parameters, to the extent available, related to the equipment and relevant system conditions in its network. The SSTI studies shall be carried out by the TSO with the support of the HVDC system owner. The HVDC system owner shall provide the relevant TSO all relevant data and models that allow such study to be performed. The studies shall identify the conditions, if any, where SSTI exists and propose any necessary mitigation procedure. All parties shall be informed of the results of the studies.</p>



Article 31	<p>approved by the NRA.</p> <p>31(4) 31(5) 31(6) : As the TSO shall be responsible to carry out the study, there is no need for an assessment, a review or a replication</p> <p>31(5) As the HVDC system owner is responsible for the possible impacts of its project in the area of "electrical proximity", he should cover the costs associated to the study</p>	<p>3. All parties identified by the relevant TSO as relevant to each connection point, including the relevant TSO, shall contribute to the studies and shall provide all relevant data and models as reasonably required to meet the purposes of the studies. The relevant TSO shall collect this input</p> <p>4. to be deleted</p> <p>5. to be deleted</p> <p>4. Any necessary mitigating actions identified by the studies carried out in accordance with paragraphs 2 or 4, by the relevant TSOs, shall be undertaken by the HVDC system owner as part of the connection of the new HVDC converter station.</p> <p>6.5. The cost associated with the studies carried out by the TSO shall be borne by the HVDC owner.</p>
Article 32		
Article 33		
Article 34		
Article 35		
Article 36		
Article 37		



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

The maximum file size is 1 MB

TITLE III - REQUIREMENTS FOR ASYNCHRONOUSLY CONNECTED  
POWER PARK MODULES, ASYNCHRONOUSLY CONNECTED  
DEMAND FACILITIES, ASYNCHRONOUSLY CONNECTED POWER-TO-  
GAS DEMAND UNITS, ASYNCHRONOUSLY CONNECTED  
ELECTRICITY STORAGE MODULES AND REMOTE-END HVDC  
CONVERTER STATIONS

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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 38		
Article 39		
Article 40		
Article 40a[NEW]		
Article 40b[NEW]		
Article 41		
Article 42		
Article 43		
Article 44		
Article 45		
Article 46		
Article 47		
Article 48		
Article 49		
Article 50	EDF understands in this article that the topic of frequency harmonics is embedded, with coordination performed at the national level	



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

The maximum file size is 1 MB

TITLE IV - INFORMATION EXCHANGE AND COORDINATION

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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 51		
Article 52		
Article 53		
Article 54		



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

The maximum file size is 1 MB

## TITLE V - OPERATIONAL NOTIFICATION PROCEDURE FOR CONNECTION

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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 55		
Article 56		
Article 57		
Article 58		
Article 59		
Article 60		
Article 61		
Article 62		
Article 63		
Article 64		
Article 65		
Article 66		



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 VI - 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 67		
Article 68		
Article 69		
Article 70		
Article 71		
Article 72		
Article 73		
Article 74		
Article 75		
Article 76		



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 VII - 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 77		
Article 78		
Article 79		
Article 80		
Article 81		
Article 82		
Article 83		



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 VIII - 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

	Comment on the ACER draft amendments	Alternative text amendment proposal (if applicable)
Article 84		
Article 85		
Article 85a[NEW]		
Article 86		



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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## Annex I - Frequency ranges referred to in Article 11

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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)
Annex I	EDF proposes to erase the new requirement regarding the 52 Hz-52,5 Hz frequency range. It is not justified and was initially only created to take into account the new RocoF profile in the overfrequency range. No real analysis was performed about it. Requirements should be set after a robust justification of system needs, be subject to cost-benefit analysis (because they can imply huge costs for generators and deter investment) and after assessment of alternative network solutions	To delete requirement between 52 and 52,5



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## Annex II - Requirements applying to frequency sensitive mode, limited frequency sensitive mode overfrequency and limited frequency sensitive mode underfrequency

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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)
Annex II		



Please upload figures or tables if necessary

The maximum file size is 1 MB

## Annex III - Voltage ranges referred to in Article 18

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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)
Annex III		



Please upload figures or tables if necessary

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## Annex IV - Requirements for U-Q/Pmax-profile referred to in Article 20



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)
Annex IV		



Please upload figures or tables if necessary

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## Annex V - Voltage-against-time-profile referred to in Article 25

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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)
Annex V		



Please upload figures or tables if necessary

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## Annex VI - Frequency ranges and time periods referred to in Article 39(2)

(a)

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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)
Annex VI		



Please upload figures or tables if necessary

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## Annex VII - Voltage ranges and time periods referred to in Article 40



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)
Annex VII		



Please upload figures or tables if necessary

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## Annex VIII - Reactive power and voltage requirements referred to in Article 48

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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)
Annex VIII		



Please upload figures or tables if necessary

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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	

Please upload figures or tables if necessary

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### Useful links

[more info on ACERs HVDC public consultation \(https://www.acer.europa.eu/documents/public-consultations/pc2024e05-public-consultation-amendments-electricity-grid-connection-network-code\)](https://www.acer.europa.eu/documents/public-consultations/pc2024e05-public-consultation-amendments-electricity-grid-connection-network-code)

### Background Documents

[ACER draft amendment proposal NC HVDC for PC 2024 E 05.docx](#)

### Contact

ACER-ELE-2022-015@acer.europa.eu