

Proposals for amendments to the Requirements for Generators

Fields marked with * are mandatory.

Introduction

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 aims to transparently indicate to stakeholders the key policy areas in which amendments are to be expected. Moreover, the Paper draws on the alternative policy options and provides recommendations and proposed actions for the amendment process.

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

This consultation aims at gathering, from all interested stakeholders, concrete proposals for 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 amendment proposals concerning Network Code on Demand Connection, please go to the form: [NC DC](#).

Responses to this consultation should be submitted by 28 November 2022 23:59 CET.

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* Name of the stakeholder:

Mercedes-Benz AG

* Contact person:

[REDACTED]

* Contact person's email address:

[REDACTED]

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

Germany

* 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:

[REDACTED]

* 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, drafting team members, and other persons or entities involved in the European Grid Connection Network Codes amendment process)

Instructions

Stakeholders are invited to submit their amendment proposals to the RfG articles that they consider should be revised in a two-step process:

1. by inserting the proposed amendments in the provided Word file
2. by motivating/reasoning the proposed amendments through this online consultation form.

Both steps are mandatory for all amendment proposals.

(Where no amendment is proposed, the article text in the word file can be left unaltered and the cells in the consultation form can be left blank.)

The mandatory steps for submitting amendment proposals are detailed below. At the end of this section, you can find an example showing how to submit your proposals.

Step 1

Please include all your amendment proposals in the **Word file provided below using the Track Changes mode**. Once you edit the file and rename it with your stakeholder's name ("NC_RfG_stakeholder_name"), please upload it in the last section of this form (FILE UPLOAD)

[Download the Word file \(NC RfG\)](#)

Step 2

In addition, please use this form to motivate/reason your proposals, following the instructions:

General requirements for type B power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 14(1)	1	2	3
Article 14(2)			
Article 14(3)			
Article 14(4)			
Article 14(5)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
4	New provisions		

Please upload your file if necessary

The maximum file size is 1 MB

5 Select file to upload

1. Propose an amended wording of the relevant provision, as you provided in the Word file.
2. Provide the motivation/reasoning behind your proposal.
3. Indicate (if any) which other provisions of the NC RfG are impacted and may need to be amended following your proposal.
4. Provide (if any) your proposals for adding new provisions to the relevant section of the Regulation, as you provided in the Word file.
5. Upload figures or tables if necessary; text inputs should be provided directly in the consultation form.

Example

Stakeholder XYZ would like to propose an amendment to Article 27 of NC RfG. In their view, the meaning of the word "respectively" in this article is not clear. Following a two-step process, the stakeholder downloads the Word file from the **Instruction** section, turns on the Track Changes mode and edits the text (first step).



Article 27

System restoration requirements applicable to AC-connected offshore power park modules

The system restoration requirements laid down respectively in Article 14(4) and Article 15(5) shall apply to AC-connected offshore power park modules types B and C, respectively.

Article 28

General system management requirements applicable to AC-connected offshore power park modules

The general system management requirements laid down in Article 14(5), Article 15(6) and Article 16(4) shall apply to AC-connected offshore power park modules.

After saving the edited file on their device under the name "*NC_RfG_Stakeholder_XYZ*", the stakeholder uploads it in the **FILE UPLOAD** section.

Pages

Introduction	Instruction	Whereas	Definitions	TITLE I	TITLE II CH. 1	TITLE II
TITLE III	TITLE IV	TITLE V	TITLE VI	TITLE VII	Other	FILE UPLOAD

FILE UPLOAD

Please upload the Word file (downloaded from the *Instruction* section) containing all your amendments

The maximum file size is 1 MB

NC_RfG_Stakeholder_XYZ.docx

Select file to upload

Previous

Submit

The stakeholder proceeds to motivate/reason their proposal. As they would like to propose an amendment to Article 27 of NC RfG, they enter **TITLE II CHAPTER 4** Section and insert the proposed amended wording and the reasoning (second step). As the proposed amendment of Article 27 does not affect other provisions, they leave the last column blank.

Pages

[Introduction](#)[Instruction](#)[Whereas](#)[Definitions](#)[TITLE I](#)[TITLE II CH. 1](#)[TITLE II CH. 2](#)[TITLE II CH. 3](#)[TITLE II CH. 4](#)[TITLE III](#)[TITLE IV](#)[TITLE V](#)[TITLE VI](#)[TITLE VII](#)[Other](#)[FILE UPLOAD](#)

TITLE II CHAPTER 4 - Requirements for offshore power park modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 23	//	//	//
Article 24	//	//	//
Article 25	//	//	//
Article 26	//	//	//
Article 27	The system restoration requirements laid down in Article 14(4) and Article 15(5) shall apply to AC-connected offshore power park modules types B and C, respectively.	The current wording of Article 27 refers to the provisions of Articles 14(4) and 15(5). However, it is unclear from the legal text how the respective application should be understood. Indicating that the requirements of Article 14(4) shall apply to offshore PPMs type B and requirements of Article 15(5) shall apply to offshore PPMs type C follows the internal logic of the NC RfG and corresponds with the capabilities of the units in question.	- //
Article 28	//	//	//

As the survey is long,

1. you have the possibility to edit your answer after submission. When clicking on "submit", you will be given a contribution ID, which you can then use to access your contribution here. This allows you to proceed in steps.
2. 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

Please write your amendment proposal and the reasoning in the table below.

Numbers in the first column correspond with the recitals of the NC RfG Whereas section

	Amendment proposal	Reasoning	Relation to other provisions
(1)			
(2)			
(3)			
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(30)			
(31)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new recitals	Reasoning	Relation to other provisions
New recitals			

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
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(11)			
Article 2(12)			
Article 2(13)			
Article 2(14)			
Article 2(15)			
Article 2(16)			
Article 2(17)			
Article 2(18)			
Article 2(19)			
Article 2(20)			
Article 2(21)			
Article 2(22)			
Article 2(23)			
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Article 2(27)			
Article 2(28)			
Article 2(29)			
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Article 2(59)			
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Article 2(61)			
Article 2(62)			
Article 2(63)			
Article 2(64)			
Article 2(65)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new definitions	Reasoning	Relation to other provisions
	<p>NEW (66) Pooling An aggregation mechanism which groups distributed power generating units/consuming modules (PGU/PGCM) into one logical unit to support the system with services or to offer services to market places. Intelligent pooling algorithms take into account the status of the PGU/PGCM and the status of the connection point (CP), to obtain an optimal usage profile for each PGU/PGCM and to evaluate the real static and dynamic station at every connection point</p> <p>NEW (67) Continuously adjustable storage systems Includes electro-chemical storage</p>	<p>NEW (66) "EVs will be members of a pool. The data of the pool could also be used by SOs for system operation and planning. This is part of monitoring compliance and improving control and protection device settings to coordinate operation and planning processes. Since EVs are mobile storage devices that may be connected in different grids, the pooling mechanisms should be harmonized on EC-level. Electric vehicles (including bi-directional charging EVs) should be considered as 'service providing unit'. Under the current definition, EVs risk to be excluded from the framework. As their primary purpose is mobility, EVs differ from stationary batteries in two key characteristics that must be considered: 1) EVs are only temporarily connected to a common connection point; and 2) EVs can change the common connection point (even beyond a border)"</p>	

New definitions	units with continuously adjustable bi-directional inverter-based charging and discharging devices. In particular, this includes stationary batteries and batteries used in electric vehicles. They form a power-generating and power-consuming module.	NEW (67) Based on the origin of the word, the term "load" remains reserved for the PGM (e.g. "partial load"). The term "consumption" is used for the charging process of PGCMs. In the context of PGCMs, the term "load" also covers the operating range of the power generating process.	NEW (66) "European Commission COM(2020) 789 final ""Sustainable and Smart Mobility Strategy - putting European transport on track for the future""
	NEW (68) Discretely switchable consumption equipment Loads and storage units in charging mode that can be switched on or off as a whole or in discrete stages.	Operation along the characteristic is required (stationary storage units, electric vehicles, etc.; bi-directional charging of electric vehicles is neither explicitly required nor excluded).	Annex: Action Plan ""Sustainable Mobility"" 1: Revision of the recast Renewable Energy Directive (2021) 11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021) 52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)"
	NEW (69) Grid-forming Fundamental capability to maintain a stable operating point with constant voltage and frequency during hypothetical standalone operation. The stability must also be maintained for defined disturbances with steady-state and dynamic deviations from the operating point.	NEW(68) To ensure the stability of the system, it is necessary to use loads and storage for different flexibility options. EVs can play an important role, as they can act as both load and storage, thus supporting flexibility options in both directions.	NEW (67) Network Code on "demand side flexibility" Code
	NEW (70) System-Supporting Includes the design of control	NEW (69) The conversion of power systems to increasingly decentralized feed-in based on converter-based solutions (Type 2) requires extended functionalities of the	NEW (68) Network Code on "demand side flexibility" Code

devices for active and reactive power balancing at the CP so that the plant supports network stability beyond the CP without having grid-forming characteristics. These characteristics must be provided by other PGUs without being unduly impaired by the system-supporting characteristics and are only permissible to a very limited extent.

NEW (71)

Market-based primary control
Use of primary control traded on the control energy market and used exclusively in the frequency range of 49.8 Hz to 50.2 Hz (FSM).

NEW (72)

Primary control based on network security
Primary control contribution of power-generating modules and continuously adjustable consumption devices required outside the frequency range of 49.8 Hz to 50.2 Hz to ensure network security (LFSM-O/U).

individual feeders and storage systems. A key condition is that generating units support the formation of systems fundamentally with Type 1-like properties and are not just connected to the grid.

NEW(70)

System supporting properties are necessary for the changing system to actively support stability through appropriate behavior by increasing the use of Type-2 facilities and reducing Type-1 facilities, without requiring immediate grid-forming properties.

NEW (71)

The different PGU/PGCM can be used for market options or in some cases to support the system to maintain stability. It is necessary to differentiate market-based activities in the normal used frequency range in comparison to activities with the PGU/PGCM outside the normal used frequency range since the requirements on the PGU/PGCM are different and the usage can be prioritized.

NEW(72)

If the power system must be

	stabilized actively since frequency margins are violated, measures to preserve stability must be prioritized. The definition delimits market actions.	
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TITLE I - General provisions

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 1			
Article 3	<p>3 (NEW)</p> <p>The relevant system operator shall refuse to allow the connection of a power-generating module which does not comply with the requirements set out in this Regulation and which is not covered by a derogation granted by the regulatory authority, or other authority where applicable in a Member State pursuant to Article 60. The relevant system operator shall communicate such refusal, by means of a reasoned statement in writing, to the power-generating facility owner and, unless specified otherwise by the regulatory authority, to the regulatory authority.</p> <p>Besides other PGU/PGCM, electric vehicles (EVs) with the ability to act as a mobile storage device - not connected to a fixed, unique connection point - could be used in a pool of assets to support services and ancillary services.</p>	<p>3 (NEW)</p> <p>EVs should form a separate asset class as they need to be harmonized at EU level with similar technical requirements.</p> <p>This is very important as EVs can be used in different member states - therefore harmonized market criteria and a harmonized technical framework on minimum technical parameter requirements must be available from the beginning.</p>	
Article 4			
			5 (2)

Article 5

5 (2)

The new asset class Type EV is necessary in order to harmonize the usage of EV in all member states and to prevent discrimination.

EVs can support the system with services on TSO-level and on DSO-level.

The EV-pooling aggregator uses the information from the EV

- especially usage characteristics, availability, battery status ... and
- detailed grid measures meaning detailed information about both statuses of the EV itself and the connection point to the grid.

Both pieces of information give detailed insight into whether or not a distinct EV can be used within the pool, with respect to both pieces of information.

5 (NEW)

Since EVs are highly standardized assets, besides local services at the connection point (like Type A or B), global services could be offered via the pooling mechanisms.

The new asset class Type EV is

European Commission
COM(2020) 789 final

"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"

Annex: Action Plan "Sustainable Mobility"

1: Revision of the recast
Renewable Energy Directive (2021)

11: Revision of Energy
Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)

52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)

5 (NEW)

European Commission
COM(2020) 789 final

"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"

Annex: Action Plan "Sustainable Mobility"

1: Revision of the recast
Renewable Energy Directive (2021)

	<p>5 (2) The threshold value for Type EV PGU/PGCM shall be set to 135 kW harmonized in all member states. Pooling aggregators shall be treated similarly to Type C or Type D PGUs, if they offer services for TSO-level. EV-Pools in DSO-level shall be treated like Type B PGUs.</p> <p>5 (NEW) Pooling mechanisms must be prequalified, to use the distributed PGU/PGCM, especially EVs. The pooling mechanism must ensure, that the pool has the ability to fulfill all service prequalification requirements. The pooling mechanisms should be certified, whereas the certification of Type A to D PGUs will be done in relation to a distinct connection point, the pooling mechanisms use a statistical basis of available EVs so that all reliability aspects can be met. The threshold value for Type EV PGU/PGCM shall be set to 135 kW harmonized in all member states.</p>	<p>necessary in order to harmonize the usage of EV in all member states and to prevent discrimination.</p>	<p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021) 52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)</p>
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Article 6	<p>5 (NEW)</p> <p>Pooling aggregators will be treated like a distributed PGU and have to fulfill the requirements of the asset class Type EV, with variable connection points</p>	<p>6 (NEW)</p> <p>The actual Code on Requirements for Generators does not refer to distributed PGU, which will be used via pooling mechanisms to form a bigger unit to support services on TSO-level or on DSO-level, especially ancillary services.</p>	
Article 7	<p>7 (NEW)</p> <p>The technical requirements for EVs are fixed on EC-level according to Type EV. If necessary, the relevant TSO should set up requirements for the pooling mechanisms, but not for the EV itself.</p>	<p>7 (NEW)</p> <p>In order to use EVs in all member states without discrimination, they should be able to operate without borders between member states. It is therefore necessary that EVs form a separate asset class compared to storage units that are connected to the grid at a unique connection point. This shall be valid in a harmonized standard within all member states.</p>	<p>7 (NEW)</p> <p>European Commission COM(2020) 789 final</p> <p>"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"</p> <p>Annex: Action Plan "Sustainable Mobility"</p> <p>1: Revision of the recast Renewable Energy Directive (2021)</p> <p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)</p> <p>52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)</p>

Article 8	<p>8 (NEW)</p> <p>Poolable PGU/PGCM could cover the area of several TSOs or DSOs. In this case, the relevant TSO is the one with the highest impact on the PGU/PGCM (e.g. EVs of the pool) on this grid area. The different TSOs or DSOs shall coordinate the technical implementation of the pool. One TSO or DSO is the coordinator.</p>	<p>8 (NEW)</p> <p>To establish sustainable smart mobility within the EU and each member state, a unified procedure is necessary, to establish "cross-border" pools.</p> <p>The same must be established between the borders of different DSOs.</p> <p>In general EVs shall fulfill the technical requirements after Type EV. The relevant TSO or relevant DSO shall use this without changes.</p>	<p>8 (NEW)</p> <p>European Commission COM(2020) 789 final</p> <p>"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"</p>
Article 9			
Article 10	<p>10 (NEW)</p> <p>In the case of pooling aggregators of PGU/PGCM (e.g. EVs), the relevant TSO or DSO coordinate their activities for public consultation.</p>	<p>10 (NEW)</p> <p>Pooling of EVs will be a "cross-border" issue between different TSOs and/or DSOs going forward.</p>	
Article 11	<p>add:</p> <p>... including pooling aggregators who offer services or ancillary services on different voltage levels with distributed PGU/PGCM (e.g. EVs)</p>	<p>add:</p> <p>The pooling aggregator shall be a part of the stakeholder list</p>	
Article 12			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles	<p>"The relevant system operator shall refuse to allow the connection of a power-generating module which does not comply with the requirements set out in this Regulation and which is not covered by a derogation granted by the regulatory authority, or other authority where applicable in a Member State pursuant to Article 60. The relevant system operator shall communicate such refusal, by means of a reasoned statement in writing, to the power-generating facility owner and, unless specified otherwise by the regulatory authority, to the regulatory authority. Besides other PGU/PGCM, electric vehicles (EVs) with the ability to act as a mobile storage device - not connected to a fixed, unique connection point - could be used in a pool of assets to support services and ancillary services."</p>	<p>"EVs should form a separate asset class as they need to be harmonized at EU level with similar technical requirements. This is very important as EVs can be used in different member states - therefore harmonized market criteria and a harmonized technical framework on minimum technical parameter requirements must be available from the beginning."</p>	

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TITLE II CHAPTER 1 - General Requirements

General requirements for type A power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 13(1)	<p>"EVs or other PGU/PGCM technologies, which are dependent on the storage status, the available environmental conditions or other influence parameters, which cannot fulfill Table 2, shall be excluded from the list.</p> <p>Pooled EVs or other PGU/PGCM can fulfill the requirements according to Table 2 in a statistical manner since many members of the pool can be used in different time intervals so that the overall requirements can be met."</p>	<p>"Single EVs are not connected permanently to the grid. It could be possible that due to reduced storage capacity, technical requirements of the EV (battery temperature, ...) the EV is not available.</p> <p>Pooled EVs can fulfill the requirements on the basis of the statistical number of EVs in the pool. It is necessary to use uniform definitions in all member states.</p> <p>A unified asset class for EV shall be established to ensure unified connection condition between the DSO/ TSO on EC level. The EV has to ensure mobility options for the user, it is a part of the power system with the capability of a mobile storage.</p> <p>The EV shall not be discriminated by local technical requirements to participate on different markets (global, local services)."</p>	<p>"European Commission COM(2020) 789 final</p> <p>""Sustainable and Smart Mobility Strategy - putting European transport on track for the future""</p> <p>Annex: Action Plan ""Sustainable Mobility""</p> <p>1: Revision of the recast Renewable Energy Directive (2021)</p> <p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)</p> <p>52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)"</p>
		<p>"The next generation EVs shall be prepared for bidirectional charging /discharging, support grid forming technologies with their inverter technologies and support LFSM-O / LFSM-U.</p>	

Article 13(2)	EVs support LFSM-O/LFSM-U properties, smooth controller actions with almost bumpless controller behaviour with suitable damping characteristic shall support system stability objectives, also.	With an adopted controller design, suitable damping characteristics shall support system stability objectives. Ancillary services shall be supported. The intelligence for charge /discharge control, regulation and protection can be implemented differently in the vehicle or the charging infrastructure."	
	(2g) EVs support LFSM-O/LFSM-U properties and also smooth controller actions with almost bumpless controller behavior with suitable damping characteristic shall support system stability objectives.	(2g) "The next generation EVs shall be prepared for bidirectional charging /discharging, support grid forming technologies with their inverter technologies and support LFSM-O / LFSM-U. With an adopted controller design, suitable damping characteristics shall support system stability objectives. Ancillary services shall be supported. The intelligence for charge /discharge control, regulation and protection can be implemented differently in the vehicle or the charging infrastructure."	
Article 13(3)			
Article 13(4)			
Article 13(5)			
Article 13(6)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions	<p>NEW 13(8) EVs form a separate asset class Type EV, since they are mass products with special inherent behavior and have a distinct influence on the power system operation and planning, especially on stability aspects and power quality.</p> <p>NEW 13(9) Unlike the requirements in Table 2, EV shall be used with harmonized settings within all member states. Some further requirements can be provided by a pool of EVs.</p>	<p>NEW 13(8) "In LV-Grids, EVs are a member of mixed plants, combinations of load, other feeders like PV, heating pumps, ... Some business models for V1G and V2G in combinations will be established. A connection point with only Type-A PGUs will not be the basic case in the future."</p> <p>NEW 13(9) EVs form a class of mobile assets, which can move cross-border between member states. It is necessary to describe a set of unified requirements e.g. similar to Central Europe - Table 2 - to avoid discrimination at country borders.</p>	

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General requirements for type B power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 14(1)			
Article 14(2)	<p>"The next generation EVs shall be prepared for bidirectional charging /discharging, support grid forming technologies with their inverter technologies and support LFSM-O / LFSM-U.</p> <p>With an adopted controller design, suitable damping characteristics shall support system stability objectives. Ancillary services shall be supported.</p> <p>The intelligence for charge /discharge control, regulation and protection can be implemented differently in the vehicle or the charging infrastructure."</p>	<p>EVs support LFSM-O/LFSM-U properties and also smooth controller actions with almost bumpless controller behavior with suitable damping characteristic shall support system stability objectives.</p>	
Article 14(3)			
Article 14(4)			

Article 14(5)	<p>14(5d) "For pooling mechanisms, data from the PGU/PGCM and the ""moving target"", data security and data integrity requirements must be met. Due to the upcoming huge amount of EVs, intelligent data measurement and data communication shall be used to collect and evaluate the data at edge level and communicate when system status changes, which is important for the pooling mechanisms so that the EV could be a member of the pool and fulfill the requirements at the connection point. A system management respects the requirements of the grid and the pool. A unified data model und data communication shall be used."</p>	<p>14(5d) It is necessary to go further towards the harmonization of flexibility data exchange for SP communication across Europe leveraging data exchange standards already developed for wholesale markets (e.g., IEC 62325). This should be expanded also to cover sub metering data. Any efforts on this matter should be linked to the work done on the Implementing Act on Data and Interoperability. Due to the huge amount of EVs it is necessary to use intelligent solutions to communicate only relevant data. A permanent data stream will submit highly redundant data, which are hard to handle and have less information. Further: The new rules shall reflect that interoperability between any number of tools (at EU and MS level) is required. Lack of interoperability may delay progress, as SOs avoid building tools ahead of the new rules potentially coming into force, and even one tool per MS would still leave SPs with 27 different tools to deal with.</p>	<p>14(5d) Data exchange standards for energy markets. e.g. IEC 62325 New EC Network Code on cybersecurity The required technical framework on communication and data integrity must be fulfilled. The required SOC - Security Operation Center - must be operated in an efficient manner. A classical data stream has a share of more than 99.9 % of redundant data. From this point of view, it is necessary to establish a system management, which respects the requirements of the pool and the fact, that the EVs of the pool can be located in the grid of different DSO / TSO.</p>
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Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions	"Data communication shall respect the requirements of the EC Network Code on cybersecurity. Exchanged and communicated data should only be based on relevant data. Only standardized simulation models from a catalog shall be used for analysis."	The new rules shall state that operational data for any given service from the service providing unit or group shall only be required if the SO demonstrates that the SO will change its operations upon receiving operational data from the unit or group. Mere performance surveillance shall not be sufficient to justify operational data, e.g. telemetry data of individual EVs.	

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General requirements for type C power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 15(1)			
Article 15(2)			
Article 15(3)			
Article 15(4)			
Article 15(5)			
Article 15(6)	15(6c)The pooling characteristics shall be described with predefined models for static and dynamic analysis, which respects that different market options could be established at one single connection point.	15(6c) For operating and planning processes, the network operator has to simulate and rate the situation at the connection point and the overall situation of the grid, including adjustment and setting of suitable parameter sets (static, dynamic - e.g. damping behavior).	

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions	A pool of assets (e.g. EVs) shall be treated as a flexibility and service provider for PGU/PGCM. Prequalification methods shall be established on EC-level.	The classical general requirements on Type C offers a lot of individual settings by relevant TSO. In the case of pooled EVs, the prequalification shall be unified on EC-level, so that a "moving" mobile EV can be used in different market situations independent from the location.	Network Code on "demand side flexibility"

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General requirements for type D power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 16(1)			
Article 16(2)			
Article 16(3)			
Article 16(4)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions	<p>A pool of assets (e.g. EVs) shall be treated as a flexibility and service provider for PGU/PGCM.</p> <p>Prequalification methods shall be established on EC-level. A common data model and data exchange shall be used.</p>	<p>Since pooling mechanisms use both market relevant data and the internal status, usage profiles of EVs and the technical status at the connection point.</p> <p>The huge number of bidirectional charging / discharging EVs will offer services comparable to Type D plants.</p> <p>Example: 4 millions of EV, 10 kW active power means 40 GW of power, which can be offered for services.</p>	<p>Network Code on "demand side flexibility"</p> <p>DIN EN IEC 62325-ff Framework for energy market communication</p>

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

Requirements for type B synchronous power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 17(1)			
Article 17(2)			
Article 17(3)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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Requirements for type C synchronous power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 18(1)			
Article 18(2)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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Requirements for type D synchronous power-generating modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 19(1)			
Article 19(2)			
Article 19(3)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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TITLE II CHAPTER 3 - Requirements for power park modules

Requirements for type B power park modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 20(1)			
Article 20(2)	<p>20(2a)</p> <p>EV shall be used in a unified manner, distinct requirements are focused on the charging infrastructure at the connection point.</p>	<p>20 (2a)</p> <p>Some different assets - mixed plants - are connected to the connection point, which could offer their services to different market places at the same time. This requires a system management to coordinate the actions. Fixed requirement on distinct assets makes no sense, any longer.</p>	<p>20 (2a)</p> <p>EC Network Code on demand site flexibility - Article 5 asks for ancillary services for voltage control with the integration of local assets.</p>
		<p>"Robustness criteria for a pool must be established.</p> <p>Article 3 b (v) requests for suitable damping on active power swings. This is a very restricted view on the topic. In practice a lot of interacting process in the frequency range for app. 0 Hz up to higher frequencies, even up to some kHz, some 100 kHz in the future. These interacting process are in general a result of dynamic interaction of assets. In this case some different physical phenomena can occur e.g. resonance processes.</p> <p>The definition for stability and the focus on dynamics must be</p>	

Article 20(3)	<p>For pooled EVs, unified criteria on robustness of the pool and the EV at the connection point shall be established.</p> <p>Local settings shall be established via the charging / discharging infrastructure and not to the distinct EV.</p> <p>The settings of parameters and the operation of different PGU/PGCM at the same time incorporates some risks and therefore needs to be coordinated at some levels.</p> <p>Protection schemes shall cover the overall frequency range to protect the PGU/PGCM from the grid and if PGU/PGCM are defect, to protect the grid in time and frequency domain.</p>	<p>revised, since some different stability aspects are incorporated - sometimes at the same time.</p> <p>This topic is necessary to define, since due to interacting processes, resonances, ... the PGU/PGCM can become defective, in individual cases also be destroyed.</p> <p>Effective protection schemes for this topic shall be established. It is not enough to focus on classic criteria.</p> <p>Charging / discharging infrastructure with a high power inlet / outlet will be used via the DC-link to the EV. The charging / discharging infrastructure shall be connected and operated according to Type B."</p>	
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Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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Requirements for type C power park modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 21(1)			
Article 21(2)	<p>21 (2b)</p> <p>Synthetic inertia for pooled EVs depends on the size of the pool and the capability of each EV.</p> <p>A pool of distributed PGU/PGCM with a pool size according to Type C doesn't have to fulfill the requirements of 2b.</p>	<p>21 (2b)</p> <p>The classical general requirements of Type C offer a lot of individual settings by relevant TSO. In the case of pooled EVs, the prequalification shall be unified on EC-level, so that a "moving" mobile EV can be used in different market situations independent from the location.</p>	
Article 21(3)			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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Requirements for type D power park modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 22			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions in this section	Reasoning	Relation to other provisions
New provisions			

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TITLE II CHAPTER 4 - Requirements for offshore power park modules

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 23			
Article 24			
Article 25			
Article 26			
Article 27			
Article 28			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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TITLE III - Operational notification procedure for connection

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 29			

Article 30	<p>30 (2e) In the ramp-up process of bidirectional charging / discharging EVs, this upcoming class of EVs shall be treated as emerging technology to accompany the transition process.</p> <p>30 (NEW) EVs are nonstationary PGU /PGCM. They shall be treated by general unit certificates. The charging / discharging infrastructure is part of the Type A / EV operational notification process.</p>	<p>30 (2e) Deployment of smart meters should not be considered a prerequisite for market participation, as certified sub metering and metering devices provided by the BSP should be on equal footing to the smart meter. There are occasions where the deployed smart meters lack the required capabilities for some products (due to data granularity, latency etc.). Sub metering should be an equal alternative to smart meters, provided that they are certified and approved by the SOs and approved for the settlement. It should be used in consistency with main meter's data. The SP will decide which one to use based on the requirements of the product. In the case of V2G evidence requirements of B2B markets must be fulfilled, too.</p> <p>30 (NEW) EVs will be used as a mobility provider and a member of the power system. Since both abilities shall be offered to users, the general usage must be ensured in all member states in a harmonized and non-discriminatory manner.</p>	
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Article 31	<p>31 (NEW)</p> <p>In the case of pooling aggregators for EVs or other similar PGU /PGCM, EU-wide certificates shall be used.</p>	<p>31 (NEW)</p> <p>EVs will be used as a mobility provider and a member of the power system. Since both abilities shall be offered to users, the general usage must be ensured in all member states in a harmonized and non-discriminatory manner. Pooling aggregators shall have the opportunity to set up the member of the pools independent from physical borders of different network operators.</p>	
Article 32	<p>32 (NEW)</p> <p>For EVs or other PGU/PGCM used in pools unified models shall be used.</p>	<p>32 (NEW)</p> <p>EVs will be used as a mobility provider and a member of the power system. Since both abilities shall be offered to users, the general usage must be ensured in all member states in a harmonized and non-discriminatory manner. Pooling aggregators shall have the opportunity to set up the member of the pools independent from physical borders of different network operators.</p>	
Article 33			
Article 34			
Article 35			
Article 36			
Article 37			

Article 38	<p>38 (NEW)</p> <p>Pooled EVs or other PGU/PGSM as market participants with a huge amount of distributed power capabilities in low and medium voltage level can support services or ancillary services on TSO- and DSO-level. The cost-benefit analysis shall respect this.</p>	<p>38 (NEW)</p> <p>Aspects on stability of the system shall be secured at DSO level. The huge amount of distributed PGU /PGCM shall be used for these services as well as for other ancillary services.</p>	
Article 39	<p>39 (NEW)</p> <p>The relevant TSO uses the huge amount of EVs or PGU/PGCM distributed on DSO level to incorporate them into this cost-benefit analysis.</p>	<p>39 (NEW)</p> <p>Aspects on stability of the system shall be secured at DSO level. The huge amount of distributed PGU /PGCM shall be used for these services as well as for other ancillary services.</p>	

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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TITLE IV - Compliance

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 40	<p>40 (NEW)</p> <p>The pooling aggregator is responsible for the proper operation of the pool, it regularly exchanges information with the relevant network operator (located EVs) on further development of the pool and the network.</p>	<p>40 (NEW)</p> <p>This part is necessary to establish, since the disruptive change from vehicles with combustion machines towards EVs has a very significant influence on power systems operation and planning processes.</p>	

Article 41	<p>41 (3) For Type EV PGU/PGCM unified models shall be used. All the necessary requirements shall be established on EU level. A model catalog shall be established with different models, so that in a unified manner the models can be used for necessary analyses.</p> <p>41 (NEW) The pooling aggregator is a special role, since it combines the rating of the asset (usage profiles, capabilities, ...) and the knowledge of the technical capabilities of the connection point. The network operator and the pooling aggregator shall exchange information about network capabilities, possible bottlenecks, to ensure non-discriminatory operation of EVs or other PGU /PGCM with the pool.</p>	<p>41 (3) For a mass product like EVs, it makes no sense to develop different models according to the requirements of a single network operator. This should be a unified process. Beginning in the 1950, IEEE established a model catalog for different execution systems for synchronous generators. The different products from the vendors were assigned to a suitable basis model.</p> <p>41 (NEW) The pooling aggregator for EVs is a new stakeholder. The huge amount of poolable assets, which can offer services with great performance potential for different markets, will make it an important partner in combination with the relevant system operator.</p>	<p>41 (3) see: 421.1-2007 - IEEE Standard Definitions for Excitation Systems for Synchronous Machines</p>
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<p>Article 42</p>	<p>42 (NEW) In the case of pooling mechanisms, the relevant network operator has to accept the certification of the pooling mechanisms. The pooled physical assets belong to Type A, B or EV.</p>	<p>42 (NEW) For pooling mechanisms, which cover different grids from different DSO / TSO, there must be a unified method, which is accepted by all network operators. The network operator is responsible for all connections made to their network. The usage of assets via pooling mechanisms or aggregation is relevant for the network operator for network operating and planning processes.</p>	
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Article 43	<p>43 (NEW)</p> <p>For EVs in pools, the pooling mechanisms shall be proofed, so that the overall pooling behavior can be used for compliance simulations.</p> <p>The pooling mechanisms shall be certified on EU-level to be used in all member states and shall be accepted by the relevant network operator.</p> <p>The PGU/PGCM as a member of the pool belongs to Type EV, A or B.</p> <p>In the case of AC charging / discharging, the EV is in combination with the charging / discharging infrastructure responsible for compliance requirements.</p> <p>In the case of DC charging / discharging, the charging / discharging infrastructure is responsible for compliance requirements.</p>	<p>43 (NEW)</p> <p>If the EV pool belongs to Type C, or D PGU/PGCM modules, the compliance of the pooling mechanisms shall be proofed. It is necessary to certify the mechanism only once, since in practice, the pool itself is a statistical collection of a possible huge amount of EVs distributed within one or different grids on DSO / TSO level.</p> <p>Passenger EVs belong in general to Type EV / A. Bigger trucks, buses or some bigger EVs may belong to Type B.</p>	
Article 44			
Article 45			
Article 46			
Article 47			

Article 48	<p>48 (NEW) For EVs in pools, the pooling mechanisms shall be proofed, so that the overall pooling behavior can be used for compliance simulations.</p> <p>The pooling mechanisms shall be certified on EC-level to be used in all member states and shall be accepted by the relevant network operator.</p>	<p>48 (NEW) If the EV pool belongs to Type D PGU/PGCM modules, the compliance of the pooling mechanisms shall be proofed. It is necessary to certify the mechanism once a time, since in practice, the pool itself is a statistical collection of a possible huge amount of EVs distributed within one or different grids on DSO / TSO level.</p>	<p>48 (NEW) European Commission COM(2020) 789 final</p> <p>"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"</p> <p>Annex: Action Plan "Sustainable Mobility"</p> <p>1: Revision of the recast Renewable Energy Directive (2021)</p> <p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)</p> <p>52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)</p>
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Article 49	<p>49 (NEW)</p> <p>For EVs in pools, the pooling mechanisms shall be proofed, so that the overall pooling behavior can be used for compliance simulations.</p> <p>The pooling mechanisms shall be certified on EC-level to be used in all member states and shall be accepted by the relevant network operator.</p>	<p>49 (NEW)</p> <p>If the EV pool belongs to Type D PGU/PGCM modules, the compliance of the pooling mechanisms shall be proofed. It is necessary to certify the mechanism once a time, since in practice, the pool itself is a statistical collection of a possible huge amount of EVs distributed within one or different grids on DSO / TSO level.</p>	<p>49 (NEW)</p> <p>European Commission COM(2020) 789 final</p> <p>"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"</p> <p>Annex: Action Plan "Sustainable Mobility"</p> <p>1: Revision of the recast Renewable Energy Directive (2021)</p> <p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)</p> <p>52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)</p>
Article 50			
Article 51			
Article 52			
Article 53			

Article 54	<p>54 (NEW)</p> <p>For EVs the compliance simulation should be classified like Type A with the requirements of Type EV devices.</p> <p>Compliance simulations to prove the functionality of the different pooling mechanisms - similar to type B behavior - must be performed only fundamentally for the approval of the used pooling mechanisms and algorithms.</p> <p>Charging / Discharging infrastructure which extends the limits for Type A shall be proofed after Type B.</p> <p>In general, pooling mechanisms use two different data sources</p> <ul style="list-style-type: none"> - usage and availability data of the vehicle - grid state data at the distinct connection point <p>Measured and rated status information at the connection point must cover static and dynamic parameters or indicators to ensure the usage of the abilities of the connection point but not to violate them, static and dynamic.</p> <p>Compliance simulation observes the particularly protected and sensitive data on user profiles, in particular the relevant regulations on data security and integrity.</p>	<p>54 (NEW)</p> <p>EVs are highly standardized mass products that can be used in many markets simultaneously.</p> <p>Participation in market places via pooling mechanisms requires certification of these mechanisms - similar to unit certification of a physical device.</p> <p>These certification should be carried out uniformly at EU level.</p> <p>Certification carried out in one member state shall - and must - be adopted by other member states.</p> <p>EVs should participate in pools even if they cross borders.</p> <p>This implies not only cross-border activities of the TSO, but also to the respective network boundaries of the DSOs among each other - horizontally and vertically.</p>	<p>54 (NEW)</p> <p>Network Code on "demand side flexibility"</p> <p>EU 2016/679 on the protection of natural persons with regard to the processing of personal data on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)</p>
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Article 55	<p>55 (NEW)</p> <p>For EVs in pools, the pooling mechanisms shall be proofed, so that the overall pooling behavior can be used for compliance simulations.</p>	<p>55 (NEW)</p> <p>If the EV pool belongs to Type C PGU/PGCM modules, the compliance of the pooling mechanisms shall be proofed. It is necessary to certify the mechanism only once, since in practice, the pool itself is a statistical collection of a possible huge amount of EVs distributed within one or different grids on DSO / TSO level.</p>	
Article 56	<p>56 (NEW)</p> <p>For EVs in pools, the pooling mechanisms shall be proofed, so that the overall pooling behavior can be used for compliance simulations.</p>	<p>56 (NEW)</p> <p>If the EV pool belongs to Type D PGU/PGCM modules, the compliance of the pooling mechanisms shall be proofed. It is necessary to certify the mechanism only once, since in practice, the pool itself is a statistical collection of a possible huge amount of EVs distributed within one or different grids on DSO / TSO level.</p>	
Article 57			
Article 58			

Article 59	<p>59 (NEW)</p> <p>ACER ensures that no divergent EV regulations be adopted in each member state, relevant TSO, and relevant DSO that modify or adjust the EV type class.</p>	<p>59 (NEW)</p> <p>It is necessary that no adaptations to technical characteristics are built up throughout Europe, which restrict the market access of mobile storage (EV) or specify it in such a way the participations in market places - e.g. pooling - are restricted or prevented.</p> <p>If necessary, national regulatory authorities should have the power to take action against violations.</p>	
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Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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TITLE V - Derogations

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 60			
Article 61			
Article 62			
Article 63			
Article 64			
Article 65			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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TITLE VI - Transitional arrangements for emerging technologies

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 66	<p>66 (NEW) Bidirectional charging / discharging vehicles with system supporting and/or grid forming technologies, if</p> <p>a) it is member of Type EV b) it is an emerging technology until it is ramped up as specified in article 66 (2c)</p> <p>It shall be treated equally in each member state</p>	<p>66 (NEW) EVs represent a special asset group, since they are active in two sectors at the same time:</p> <p>a) mobility b) energy</p> <p>EVs should be able to be used in all markets without discrimination. They should have a technical description that is a uniform technical description that can be used in all member states without adaptation.</p>	<p>66 (NEW) European Commission COM(2020) 789 final</p> <p>"Sustainable and Smart Mobility Strategy - putting European transport on track for the future"</p> <p>Annex: Action Plan "Sustainable Mobility"</p> <p>1: Revision of the recast Renewable Energy Directive (2021)</p> <p>11: Revision of Energy Performance of Buildings Directive including enhanced provisions on charging infrastructure for e-mobility (2021)</p> <p>52: Review the current EU type approval legislation to facilitate car data-based services including interaction with energy systems (2021)</p>
Article 67			
Article 68			
Article 69			
Article 70			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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TITLE VII - Final provisions

Please write your amendment proposal and the reasoning in the table below.

	Amendment proposal	Reasoning	Relation to other provisions
Article 71			
Article 72			

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new articles in this section	Reasoning	Relation to other provisions
New articles			

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Other additional provisions

Please write your amendment proposal and the reasoning in the table below.

	Proposal for new provisions	Reasoning	Relation to other provisions
Other new provisions			

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