

36th Grid Connection European Stakeholder Committee (GC ESC)

9 December 2024, 10:00-15:00

Location: ENTSO-E Premises, Rue de Spa 8, 1000 Brussels, Belgium

Minutes

Participants		
Uros Gabrijel	ACER	Chairperson
Georgios Antonopoulos	ACER	Observer
Evangelia Vasilaki	ACER	Observer
Maria Barroso Gomes	ACER	Observer
Leonhard Bartsch	ACEA	Member Substitute
Lorenzo Corcione	APPLiA	Member Substitute
Froschauer Manuel	APG	Member
Marco Pasqua di Bisceglie	ARERA	Member
Nawid Sadighi	BNetzA	Member Substitute
Rose Kuhn	BNetzA	Member Substitute
Marc Malbrancke	CEDEC	Member
Thomas Schaupp	CENELEC	Member
Alberto Cerretti	CENELEC	Member
Julian Treichel	CharIN	Member
Florentien Benedict	DSO Entity	Member
Mike Kay	DSO Entity/ GEODE	Member
Tony Hearne	DSO Entity	Member
Santiago Gallego Amores	DSO Entity/ E.DSO	Member
Serdar Bolat	DSO Entity	Member
Tommaso Carbone	DSO Entity	Member
Andrea Hamzova	DSO Entity	Member
Tony Kim Yeat	EASE	Member
Bernhard Schowe-von der Brelie	EFAC	Member
Freddy Alcazar	EUGINE	Member
Veerle Beelaerts	EHI	Member
Richard Masquelier	EHI	Member
Adeline Houtart	EHPA	Member
Marco Zaccaria	ENTSO-E	Member
Flemming Brinch Nielsen	ENTSO-E	Member Substitute
Juan Giner Folques	ENTSO-E	Member
Christos Tsionas	ENTSO-E	Observer
Lazaros Exizidis	ENTSO-E	Member Substitute
Sergio Martinez Villanueva	ENTSO-E - REE	Member
Luca Guenzi	EU Turbines	Member
Steffen Eckstein	EU Turbines	Member Substitute

Herve Biellman	EU Turbines	Member Substitute
Assiet Aren	EUGINE	Member Substitute
Raju Srinivasa	EUGINE	Member Substitute
Emma Menegatti	EUI	Member Substitute
Thierry Vinas	EURELECTRIC	Member
Elaine O'Connell	European Commission	Member
Keith Chambers	Europgen	Member
Michaël Van Bossuyt	IFIEC Europe	Member
Martin Stoessl	Orgalim	Member
Catarina Augusto	Solar Power Europe	Member Substitute
Klaus Oberhauser	VGB Powertech	Member
Roman Bertle	VGB Powertech	Member Substitute
Vidushi Dembi	WindEurope	Member

1. Opening

1.1. Review of the agenda, approval of last meeting minutes

The Chair (Uros Gabrijel) opens the meeting and asks for comments on the agenda.

The following topics are added to the AOB:

- A brief clarification regarding further comments on the result from the ACER SPGM workstream is requested by Luca Guenzi.

The updated [agenda](#) is approved.

The minutes of last meeting were corrected:

- A correction regarding the presentation on simulation software from the previous meeting is mentioned: The minutes incorrectly referenced "certified software." The correct term should be "qualified software," emphasizing that each nation should determine its own criteria while ensuring compatibility for exchanging simulation models across different platforms.
- Replace a term "Functional Interface" with "Functional Mock-up Interface".

The corrected [minutes](#) are approved.

1.2. Review of Actions

Marco Zaccaria (ENTSO-E) presents the pending actions from the previous meeting:

Action 1 – To check contact information of Thomas Schaupp (CENELEC) in the GC ESC members' list(ENTSO-E)

Action 2 – Power-to-gas requirements: The Chair clarifies that the points mentioned in the ENTSO-E presentation on the urgency of core technical requirements for power-to-gas demand facilities will be brought to NRA's attention during the ACER SOGC Task Force meeting on Friday 13th of December.

Action 3 - Certification: Call for experts to join the EG on certification of EVs and heat pumps within 14 days under the leadership of Mike Kay (DSO Entity). Mike Kay reports a good response and thanks colleagues for helping to promote the EG – This action is now considered closed.

Action 4 – Certification: The GC ESC approves the Terms of Reference of the EG on certification of EVs and heat pumps, subject to any integrations in the December meeting and interim leadership by DSO Entity – The issue is discussed at the Point 5 of the current agenda. [Post meeting note: the Terms of Reference will be presented for approval in the GC ESC meeting of March 2025].

Action 5 – Simulation models: ENTSO-E and DSO Entity to provide feedback to EUGINE on the presented slides in the previous GC ESC meeting. As a note, this was not in the Excel presented, but EUGINE asked in the meeting to include it

2. Chair report on the Discussion Streams outcomes/progress

The Chair highlights that the workstreams provided a valuable experience and productive platforms to discuss challenging topics via informal discussions. Flemming Brinch Nielsen (ENTSO-E) shares concerns since the workstream process may undermine the formal process for developing the amendments of the connection network codes. The Chair replies that ACER volunteered to carry out the informal gathering of experts to discuss issues that stakeholders deem still open or not properly discussed before. Furthermore, the EC endorsed these informal discussions, and warmly welcomed by stakeholders. The Chair also notes that these informal discussions have not substituted the formal process that has been carried out by ACER and the formal process that is ongoing by the EC.

Thomas Schaupp (CENELEC) highlights that sharing any discussion results is very valuable, also remarking that it would be beneficial to label as individual feedback from stakeholders to the EC all the other contributes currently updated on the GC ESC website. The Chair asks ENTSO-E to discuss an updated and more clear view of the information reported on the GC ESC website related to the NCs 2.0 workstreams. Marco Zaccaria (ENTSO-E) remarks that any personal information will not be shared and invites all stakeholders to share any update on the material sent to the EC.

ACTION: ENTSO-E to align with ACER to provide an updated and more clear view of the information to be uploaded on the GC ESC website on the NCs 2.0 workstreams.

Update on the amendment process by the EC of the NCs 2.0 from DG ENER, Elaine O'Connell, stating that due to time constraints, it is challenging for the EC to meet deadlines anticipated in the past GC ESC meeting. DG ENER is currently focused on the NC RfG 2.0; before any publication, the text will be discussed with the ministries' experts from Member States. Moreover, an updated version of the NC RfG 2.0 is expected to be published for one-month consultation for feedback by mid-2025, on the EC's website. Once finalized, the EC will send the text to the Council and the Parliament.

3. EU DSO Entity

3.1. Updates DSO Entity Activities

Florentien Benedict (DSO Entity) provides an overview of DSO Entity activities during last months. An in-person meeting on grid forming took place in September in Rotterdam under Expert Group on Existing Network Codes. The expert group on Certification for EVs, EVSE, and Heat Pumps has held three meetings. Regarding the workstreams organized by ACER, bilateral meetings with stakeholders were held in between sessions. An email with recommendations was sent to the European Commission and shared with ACER, stakeholders, and ENTSO-E.

The overview is accessible [here](#).

3.2. Updates on GFC – DSO Activities

Tony Hearne (DSO Entity) updates on GFC activities. A survey of DSO Entity working group members was conducted at the last meeting in September, where each member was asked to submit a report. The majority of members reported that there was no substantive activity or awareness of Grid Forming and potential impacts.

The presentation continues on the Roadmap System Stability that was published in December 2023 by German Federal Ministry for Economic Affairs and Climate Action. The Roadmap System Stability pushes the introduction of GFM. Generation and consumption units in the distribution grid have a significant influence on system stability. Converter-based units replace the stabilizing properties of disappearing conventional power plants. Grid Forming is identified as a key technology to ensure system stability. Due to lack of experience, piloting, definition of technical requirements, and clarification of open questions should be carried out initially.

Sergio Martinez Villanueva (ENTSO-E/REE) made a remark regarding the Spanish example presented, namely on the TSO going ahead of RfG 2.0 with some changes, including on GFC, and requested EU DSO to modify the slide to avoid any potential misunderstanding concerning the national implementation process in Spain

Santiago Gallego (DSO Entity/E.DSO) defended the DSO's understanding on the Spanish TSOs activities.

Hervé Biellmann (EUTurbines) highlights that such technical issues mentioned above are not limited to DSO networks, but might be faced as well at TSO levels if not managed properly.

ACTION: DSO Entity proposes to re-upload the presentation on the ESC platform and delete the sentence.

The (new) slides on GFC update can be found on ESC Platform.

3.3. Updates on GFC – focus on DSOs

Alberto Cerretti (Enel) presents preliminary research on the impact of GFCs in DSO networks based on Enel's studies. Enel identified potential significant impacts on fully automated distribution networks due to the introduction of GFCs. Preliminary investigations have been defined to facilitate discussions on a national roadmap. Focus was given to defining the correct operation of GFCs in a DSO network, addressing key issues such as protection, islanding, and voltage control and quality. The background involves the integration of generators, including GFCs, into fully automated distribution networks, while also considering the potential for intentional islanding. Two studies were conducted with varying levels of detail, addressing specific related issues.

More detailed information is accessible [here](#).

4. ENTSO-E: RoCoF withstand capability of Type D SPGMs

Flemming Brinch Nielsen (ENTSO-E) presents ENTSO-E's view on the RoCoF withstand capability of Type D SPGMs.

ENTSO-E welcomed the amendments recommended by ACER on the NCs 2.0, as important to support the stability, robustness, and reliability of the future EU power systems. Related key considerations had already been raised with the EC on specific topics in a letter sent by ENTSO-E in March 2024, which included the RoCoF withstand capability of Type D SPGMs topic.

Regarding ACER's recommendation on the NC RfG 2.0, ENTSO-E highlights its concerns regarding RoCoF immunity for Type D SPGMs exceeding 140 MW, with a requirement of 1Hz/s for 500ms.

Several stakeholders (Thierry Vinas for Eurelectric, Rainer Fronius and Klaus Oberhauser for VGB-E, Luca Guenzi and Hervé Biellmann for EU Turbines) attending the present GC ESC meeting express surprise and concern that ENTSO-E is making further proposals in relation to RoCoF capability, as they consider the matter resolved in previous discussions, and that ACER's recommendation on the NC RfG 2.0 presented to the Commission in December 2023 was the conclusive position. The stakeholders also insisted that the requirement for type D SPGMs exceeding 140 MW was defined on the physical capabilities of assets. Tony Hearne (DSO Entity) said that in Ireland the requirement for bigger units was the same as proposed by ACER, which was consistent with Eurelectric, VGB-E and EU Turbines's point.

The Chair concludes the discussion by saying that ACER has not changed its mind on the appropriateness of ACER's proposed text (i.e., 1 Hz/s within 500 ms requirement for type D SPGM > 140 MW).

The slides can be found [here](#).

5. Updates on the EG – Development of Certification of EVs/ Heat Pumps

Mike Kay (DSO Entity) informs participants that the expert group has met three times since the September ESC. During the first meeting, the discussion focused on the intent, scope, and terms of reference as well as on agreement on administrative arrangements and workstreams. Second and third meetings focused on presentations from experts covering the following topics:

- EV & EVSE standards
- EV Homologation
- Heat pump standards and CE marking
- Compliance schemes

The third meeting also reviewed the terms of reference, with the aim of finalizing them for the March 2025 ESC. The creation of workstreams and their respective co-chairs was discussed. EV/EVSE workstream to be chaired by Julian Treichel, with Ingo Diefenbach and Miguel Martinez (both from CENELEC) as co-chairs. Heat pump workstream to be chaired by Tarik Bellahcene and Laure Meljac (Tarik representing the EHPA Secretariat and Laure as an EHPA expert).

It was suggested that future expert group meetings be held over three hours in the last week of each month, starting in January 2025. Each workstream will set its own work plan and develop terms of reference for approval by the expert group.

Adeline Houtart (EHPA) asks EC regarding the timeline for the implementation of ToR and its legal implications, particularly in relation to the network codes timeline. The question also addressed the impact of the chosen standards and certification processes on the redesign of products. Elaine O'Connell (EC) outlined that the regulation will enter into force 20 days after its publication in the Official Journal. For the previous RfG 1.0 version, it took three years for new technologies to be fully implemented. It was noted that further discussions are needed, particularly in light of concerns from both system operators and the industry regarding the potential impacts of the timeline. At this stage, it has not been fully discussed within EC, and a complete answer on this matter is still pending.

Luca Guenzi (EU Turbines) addresses to EC 2 points. The first one is on overlapping: the System Operators have 2 years after the publication of the regulation to define the draft requirements but on the same date, if a contract is signed you have to respect the same requirements. Another recommendation refers to a grace period for new requirements in the regulation. Such grace periods, typically lasting one year, were a common practice during the implementation of RfG 1.0.

The Chair concludes that the final Terms of Reference should be presented to the ESC for approval in March. An update on progress and developments is also expected at that time.

Nawid Sadighi (BNetzA) raised a question regarding the terminology of the project group named "Certification". It was noted that while the term encompasses processes like homologation and CE marking, it is not an entirely accurate representation of all activities the group handles. The use of the term "Certification" is primarily due to historical reasons. It was clarified that while homologation and CE marking are specific forms of certification, the broader term is used in this context to simplify communication.

Further details on updates on the EG on Certification are accessible [here](#).

6. Wind Europe

Vidushi Dembi from WindEurope presented her association's view on grid forming and compounding/aggregation.

For what concerns grid forming capabilities, the position of Wind Europe is that it was being rushed ahead of need and in conflict with other EU legislation. She points out that grid forming has been so far developed in very few cases, and especially in the wind sector there are not many examples. She points out that this is a very peculiar challenge, as the grid forming requirements have to be developed in parallel while developing the grid forming technology itself. Therefore, there are many risks to be considered, both for system operators and OEMs & asset developers.

To wrap up, WindEurope suggests:

- It is very important for the system operators to be able to justify and then quantify the need for grid forming contributions in their area before asking for any mandatory grid forming.
- Once there is justification of why and how much of grid forming is needed, it is very important to utilize not simply the wind or solar or renewable technology, but to select the resources that are most efficient.

Then the presentation moves to the topic of Co-location of different technologies in the latest draft of NC RfG. A German renewable asset developer called Abo Wind did a simulation to understand what would happen if they added more solar PV on the site to make it a hybrid power plant and the export capacity remains unchanged even though the installed capacity is more. What they could see here is that, after the simulated hybridization, the total generation on the site increased. They also noticed that the original MW capacity has been used more over the same period of time when the two technologies were combined. This basically demonstrates that hybrid power plants where two or more generators are combined, or generation plus storage, grid connection points are better utilised.

WindEurope calls for a harmonised understanding of reading RfG 2.0. On their point of view, the maximum export capacity for a hybrid asset needs to be defined separately.

The final recommendation on the topic of compounding is that asset owner should be flexible and able to install units of any technology behind the same connection point as long as the asset is exporting power at the connection point and is complying with the grid codes requirement based on the maximum capacity that is agreed in the contract. Moreover, WindEurope points out that there is still a need to discuss deeply on how to differentiate when to use P Max versus when to use maximum export capacity.

Thierry Vinas (Eurelectric) asks whether WindEurope considers only synthetic inertia or if they include also synchronous generation. Vidushi Dembi responds that they mostly focused on synthetic inertia. Thierry Vinas answered that rotational inertia provided by nuclear, thermal and hydro units should be taken into account as well (all inertia types).

Flemming Brinch Nielsen (ENTSO-E) says that the discussion on how we mix requirements when a lot of different facilities are located behind the same point of connection is very much needed.

Catarina Augusto (SolarPowerEurope) says that her organization supports the points on WindEurope's wish list (on the final page of WindEurope's presentation). She points out that there is a task force led by ENTSO-E working on grid forming, but it's a task force dealing with technical stuff and not to assess grid forming needs. Therefore, it is important to start working on the latter point.

Thomas Schaupp (CENELEC) saying that the hybridisation of power plants was also part of recital 11 and was also part of that SPGM and PPM discussion work stream. Therefore, it would be very important to know what has been agreed in this work stream and what has been presented to the European Commission as a common understanding.

Nawid Sadighi (BNetzA) asks whether aggregating solar and wind would create problems for both industries, when it comes to inverters that are not necessarily compatible for both. Caterina Augusto responds that this is not a problem, as hybrid inverters exist already. Mike Kay (DSO Entity/Geode) reinforces the need to have clarity on the rules for compounding.

The Chair, on the need of clarifying the topic, perhaps also through an IGD, says that we all will need to wait and see the Commission's proposal, because the Commission might amend recital 11. Therefore, the Chair suggests waiting for the Commission's proposal before moving on with an IGD and/or expert group on this topic. This point will be further discussed in March.

Full presentation is accessible [here](#).

7. CENELEC - Current state of work on the standards

Thomas Schaupp from CENELEC gave an update on the key standards.

EN 50549-10 was published in 2022 but immediately there were a large number of issues to address. Work on this is urgent and ongoing and there will be public enquiry on the proposed updates in early 2025 with possible new version at the end of 2025 or early in 2026.

For grid forming converters, prTS 50744-1 is underway – the first complete draft is expected in April 2025; with publication October 2026. This specification will:

- Define parameters that are representing the electrical characteristics of grid forming;
- Set suitable compliance assessments procedures to determine these characteristics.

It covers:

- Voltage source behaviour
- Provision of inertial response
- Power quality
- Controller stability/interactions

There is a new Dispatchable Loads standard in the pipeline. This is based on IEC TS 62898-3-3 which is a document tailored to the dispatchable load needs of microgrids.

Finally, there is expected to be a new 50549 document for the compliance assessment of generating units for Type C and D PGMs (as 50549-10 only covers types A and B).

Full presentation can be found [here](#).

8. ACER – updates on HVDC NC

Georgios Antonopoulos provided an update on ACER's draft proposals for the HVDC NC 2.0 and identified the key areas of change.

The application of the NC HVDC to systems on islands of Member States was discussed, with an emphasis on provisions to allow the flexibility to extend the code's applicability to systems and connected offshore equipment on EU MSs islands. ACER notes that in HVDC NC 1.0 they are excluded and that amendments have been proposed to be included in NC HVDC 2.0 to allow the flexibility to MSs to apply or not the NC HVDC 2.0 to such systems. Additionally, ACER mentioned that the ACER draft amendment proposal included provisions allowing for differentiated requirements of general application for multiterminal HVDC systems, recognizing the specific needs of these configurations.

The topic of significant modernization was addressed, highlighting efforts to improve alignment with ACER's recommendation No 3/2023 on proposed amendments to the NC RfG and DC.

Technical requirements for HVDC systems were outlined, including overvoltage-ride-through capability, voltage phase angle jump withstand capability, passivity requirements, and the operation of HVDC converter stations in STATCOM mode. For power-to-gas demand units, overvoltage-ride-through capability is included in the ACER draft amendment proposal.

The full presentation can be found [here](#).

9. AOB

A) EU Turbines - SPGM definition and recitals

Luca Guenzi (EU Turbines) wishes to propose a slightly revised formulation of NC RfG 2.0 recital 11 and article 2(9). EU Turbines had strongly supported the proposed revision of recital 11 and article 2(9) proposed by Europgen, and supported by Eugene. However, EU Turbines realise that the use of the word "machine" could cause confusion, particularly with the interpretation of other EU legislation. To address this, a slightly revised proposal was suggested, advocating for the use of "generating units" instead of "machine" to ensure clarity and avoid unintended collateral effects. Luca Guenzi confirms that the proposal has been sent to the Commission, and to ENTSO-E for including in the materials for this meeting.

The slides with full text are accessible [here](#).

B) GC ESC meetings in 2025

The proposed dates for the GC ESC meetings in 2025 were presented and discussed. Due to an overlap with the Market ESC meeting, the June and the December proposed dates will be updated.

ACTION: ENTSO-E and EU DSO Entity to align with ACER on new dates to host the June and the December 2025 GC ESC meetings.

The Chair thanked all participants and ended the meeting.