36rd System Operation European Stakeholder Committee (SO ESC)

3 March 2026, 13:00 - 16:00

Location: Ljubljana, ACER

Minutes

Name	Affiliation	Role
Uros Gabrijel	ACER	Chairperson
Domen Kodric	ACER	Observer
Georgios Antonopoulos	ACER	Observer
Maria Barroso Gomes	ACER	Observer
Evangelia Vasilaki	ACER	Observer
Jan KOSTEVC	ACER	Guest
Marco Pasquadibisceglie	ARERA	Observer
Thomas Hölzer	BNetzA	
Florentien Benedict	CEDEC/DSO Entity	Member
Serdar Bolat	DSO Entity	Member
Tony Hearne	DSO Entity	Member
Andrea Hamzova	DSO Entity	Member
Marc Malbrancke	CEDEC	Member
Gunnar Kaestle	COGEN	Member
Santiago Gallego Amores	EDSO	Member Substitute
Gamze Dogan	ENTSO-E	Member
Marco Zaccaria	ENTSO-E	Member
James Hellinckx	ENTSO-E	Member
Cherry Yuen	ENTSO-E	Member
Nalan Buyuk	ENTSO-E	Member
Habir Paré Nsangou	ENTSO-E	Member
Ines Encabo Caceres	ENTSO-E	Member
Hanna Ljungberg	ENTSO-E	Member
Roberto Puddu	ENTSO-E	Guest
Donatas Matelionis	ENTSO-E	Guest
Donna Kearney	ENTSO-E	Guest
Jens Albrecht	ENTSO-E	Guest
Ignacio Iriarte Ramírez	ENTSO-E	Guest
Luca Guenzi	EUTurbines	Member
Steffen Eckstein	EUTurbines	Member Substitute
Herve Biellmann	EUTurbines	Member Substitute
Freddy Alcazar	EUGINE	Member
Assiet Aren	EUGINE	Member Substitute
Arthur Hubert	EURELECTRIC	Member
Jakub Fijalkowski	European Commission	Observer
Pavla Erhartova	Europex	Member
Rainer Fronius	VGB Powertech	Member
Vidushi Dembi	WindEurope	Member
Jannis Burger	Energy Storage Europe	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 minutes of the last meeting are approved.

Gunnar Kaestle (Cogen) asks to raise a question in the AOB on voltage ranges.

Gamze Dogan (ENTSO-E) informs about the ongoing investigations on the Iberian blackout and the North Macedonia blackout, that will not be reported today. The Expert Panels are currently focused on finalising the final reports, which are expected to be published by the end of the month. A dedicated joint workshop with GC ESC will be organised after the publication of the reports.

1.2. Review of Actions

Cherry Yuen (ENTSO-E) presents the pending actions from the previous meeting.

- The update Deterministic Frequency Deviation (DFD) is planned for topic 8 of the meeting,
- The letter for the extension request from NRAs regarding the decision on Tmin LER has been linked to the documents for December 2025 meeting.

2. Update on the implementation actions at pan EU level

Cherry Yuen (ENTSO-E) informs that the PRA Biennial report 2025 has been published in December, as legally required.

3. Report on CGM Implementation

Habir Paré (ENTSO-E) presents the update on the CGM implementation.

No comments received.

The Chair (Uros Gabrijel) asks stakeholders about their interest regarding the reporting for this topic, as no comments are raised.

The topic is of interest, but the stakeholders are mainly interested in operational milestones in the implementation of the CGM.

Actions:

- ENTSO-E will report again on the CGM topic when the next implementation milestone is achieved (e.g. go-live of regional RCC task based on CGMES based CGM).
- ENTSO-E will share the link to request models for stakeholder's simulations.

4. Update on probabilistic FCR dimensioning and LLFD analysis

Roberto Pudu (ENTSO-E) provides the short update.

Janis Burger (Energy Storage Europe) reminds, for consideration, that the TminLER approach should not discriminate against consideration given to storage assets regarding FCR provision unless it is proven cost effective by the CBA.

5. Updates from DSO Entity

Florentien Benedict (DSO Entity) presents the update from the DSO Entity which focused on 3 main points:

- Recommendations on the ICS methodology;
- Updates on the DSOs Expert group work on the Iberian blackout;
- Recommendations for SO GL and NC E&R

Vidushi Dembi (Wind Europe) asks if there will be a DSO proposal to amend SO GL. Florentien clarifies that the current SOGL remains focused on transmission-level operations and does not sufficiently address the evolving operational responsibilities of DSOs.

Rainer Fronius (VGBE) asks clarification regarding the DSO statement that there were no distributed generation disconnections and overvoltage events during the Iberian blackout.

Santiago Gallego Amores (EDSO) clarifies that:

- The voltage levels in the DSO grid were within limits. Distribution grids worked on damping the voltage oscillations through the transformer in the substation that connects DSO to TSO grid.
- They do not have the real-time data for all generations; they have the information for the generators connected directly to the primary substations. They analysed a sample of those real-time data, for different parts of Spain, and there was no evidence of massive generation disconnection. In Table 3.1 of the factual report, they identify that 3 generators were in their grid and they were able to attribute the disconnection of one of them to market behaviour (wind forecast update). Even if they do not have real-time data for many small generators, there did not have any evidence of disconnection.

Rainer Fronius (VGBE) stresses the importance of understanding causal mechanisms that led to that event, rather than focusing on compliance to rules, otherwise no useful lessons learned can be drawn.

Santiago Gallego Amores (EDSO) clarifies that they, the DSOs, are not part of the Expert Panel, but they are providing the data to the Expert Panel for analysis.

Luca Guenzi (EUTurbines) asks clarification if the only event in the DSO grid was a disconnection due to market reason. Santiago Gallego Amores (EDSO) clarifies that the cause of the only disconnection identified (an installation in a large wind park), was the market program. They did not identify any other generation to support the hypothesis of disconnection.

The Chair (Uros Gabrijel) asks if the DSOs considered the phenomena of short circuit power and the interactions between power electronics.

Santiago Gallego Amores (EDSO) informs that this has not been considered yet. The work of the Ad Hoc Task Group is ongoing and they will also pay attention to the recommendations of the Expert Panel in the final report.

6. ENTSO-E's preparatory work for SO GL 2.0

Ignacio Iriarte Ramírez (ENTSO-E) presents the ongoing activity at ENTSO-E to prepare for the revision of SO GL and draft recommendations in a paper. Regarding type A generator, the ENTSO-E paper intends to clarify the definition.

Vidushi Dembi (Wind Europe) asks clarification on the amendment process for the SO GL.

Gamze Dogan (ENTSO-E) explains that the EC is working per network code, in the revision of one particular network code, an impact assessment on other regulations will be done as well, and if necessary, those regulations will be amended as well. For instance, NC DR and CACM will have an impact on SO GL, so a new version of SO GL will be adopted alongside the adoption of those network codes but limited to the impact of those network codes on SO GL. The work in SO GL 2.0 will target any other necessary amendments to SO GL.

Jakub Fijalkowski (European Commission) complements that the EC will ask officially ACER for recommendations, mainly technical ones, and all preparatory work is valuable to them.

The Chair (Uros Gabrijel) informs that ACER intends to consult on a policy paper as a preparatory work, before receiving the official request from EC for recommendations.

Arthur Hubert (EURELECTRIC) points out the importance of having a coordinated approach and timeline towards network code revision to avoid pausing it, as done for RfG.

Jakub Fijalkowski (European Commission) clarifies that the unexpected situation with the gas prices led to a re-prioritisation of tasks.

Luca Guenzi (EUTurbines) points out the importance of exchanging with stakeholders on this topic. It is agreed that the next ENTSO-E update will be done at the June meeting and, if needed, additional meeting can be planned with stakeholders.

Actions:

- ENTSO-E to share the final version of the paper on SO GL2.0 recommendations, when available, and to present an update at the next SO ESC meeting.
- ENSTO-E to present the conclusion of the project Inertia phase 2 and the next steps when phase 2 is finalised.
- ACER to present the timeline for their policy paper on SO GL2.0 at the next meeting.

7. ICS methodology update

Donna Kearney (ENTSO-E) presents the preliminary work on the ICS methodology update. The focus areas under assessment for the next revision include oscillation classification, improved monitoring of implemented recommendations, automation of voltage violation reporting and the potential consideration of near misses. DSOs called for guaranteed involvement in investigations rather than discretionary invitations. ENTSO-E will take these comments into consideration when opening the ICSm.

8. Deterministic Frequency Deviations (DFDs)

Jens Albrecht (ENTSO-E) presented an analysis showing increasing long-term frequency volatility in Continental Europe.

Gunnar Kaestle (Cogen) asks whether the shift from hourly to 15 minute MTUs has reduced large frequency spikes, and why significant spikes continue to appear at full hours. Jens Albrecht (ENTSO-E) explains that while the MTU change has caused the pattern to repeat four times per hour, the magnitude of the spikes has not yet significantly decreased. He adds that full hour spikes persist because of several operational factors—such as large changes in exchange schedules, unit commitments and real-time behaviour —overlap and reinforce one another, making it generally impossible to attribute them to a single root cause.

Gunnar Kaestle (Cogen) follows up by noting that academic literature suggests shorter MTUs should reduce frequency deviations, and asks why this improvement is not observed in practice. Jens Albrecht (ENTSO-E) explains that system behaviour results from many superimposed operational effects, which means the theoretical benefits of shorter MTUs do not materialise in a straightforward way.

Luca Guenzi (EUTurbines) asks whether stabilisation measures are already in place or planned; and if new system services will be required to manage the increasing frequency volatility.

Jens Albrecht (ENTSO-E) responds that an expert study has proposed a set of mitigation measures, with implementation foreseen over the coming years. He confirms the long-term upward trend in frequency volatility and notes that the need for additional system services is recognised, although the specific nature of these services is not yet defined. In comparing system performance across different synchronous areas, he highlights that frequency quality found outside of Continental Europe can be significantly worse (such as for example in UK).

Rainer Fronius (VGBE) asks whether large deviations near ±140 mHz—which can stress synchronous generators—were observed during an alleged Spanish incident in October, reportedly linked to the shift to 15minute MTUs, and whether this incident was investigated. Jens Albrecht (ENTSO-E) explains that he is not aware of any such incident in October connected to the MTU change. A preliminary review indicates no notable frequency disturbance during that period, though he will verify this. He adds that even large system incidents (e.g. in Ukraine in January) have had acceptable impact on system frequency, illustrating the strong inertia and resilience of the Continental Europe synchronous area.

Gunnar Kaestle (Cogen) requests whether TSOs can provide a list of all >100 mHz frequency excursions, including timestamps, to enable pattern analysis. Jens Albrecht (ENTSO-E) explains that all >100 mHz events are already logged under the ICS methodology, but determining causal attribution is extremely challenging due to the many simultaneous operational processes involved. He acknowledges the value of such information for stakeholders and notes that he will consider how these data could be shared or visualised in a useful manner. TSOs continue to analyse mitigation options. Despite the challenges in identifying root causes, the issue remains a high priority, and work is ongoing to refine understanding and potential corrective strategies.

Actions:

- ENTSO-E to investigate if there were any frequency deviation incidents in Spain in October 2025.
- ENTSO-E to assess the possibility to provide more information on the root causes for frequency deviation > 100mHz.

9. AOB

Gunnar Kaestle (Cogen) raises a question concerning voltage behaviour and immunity requirements for modern electrical loads. He notes that, historically, most loads were able to tolerate short undervoltage or overvoltage conditions without disconnecting. Today, however, many devices incorporate power electronic converters with embedded protection thresholds, meaning that modern loads may disconnect more readily during short duration disturbances. He therefore asks whether Europe should consider introducing ride-through requirements for loads, specifically overvoltage and undervoltage ride-through capabilities, to ensure continuity of operation during short disturbances. Implementing such requirements could take decades, given the vast scale and diversity of connected loads. The sector needs clarity on who would define the voltage thresholds and which forums or bodies stakeholders should approach to address these questions.

The Chair acknowledges the relevance and importance of the issue and proposes revisiting the topic at a future meeting, potentially in coordination with GC ESC.

The Chair closes the meeting.

10. Joint GC-SO ESC session on Expert Panel investigating Czech Republic incident of 4 July

Donatas Matelionis (ENTSO-E) presents the content of the Factual report published in December 2025, and presents a general overview of what will be the content of the Final report.

Luca Guenzi (EU Turbines) requests clarification regarding the manual disconnection of the overloaded 220 kV line V208 in the Czech Republic incident. He observes that the line did not trip automatically but was manually disconnected at 143% overload, which then caused further redistribution of power flows and ultimately the separation and collapse of the islanded area. Luca Guenzi (EUTurbines) asks whether the manual disconnection was intentional and based on established procedures and why the resulting cascading effects could not be anticipated. He also raises a second point regarding the planned fault tree analysis mentioned in the factual report, asking whether it will analyse only the specific incident sequence or whether it will be used more broadly to identify systemic vulnerabilities across the European system.

Donatas Matelionis (ENTSO-E) explains that the factual report states only the observed fact: the line was at 143% loading, and under operational rules, such overloads must be mitigated to prevent equipment damage. Therefore, the manual disconnection was performed in line with these rules. However, the final report will assess *how* the decision was made, *what data* was available to operators, and *whether procedural or informational issues* affected the outcome. Regarding the fault tree analysis, it will be specific to the Czech incident.

Tony Hearne (DSO Entity) points out that, given the outcome, it may be more accurate to state that it was *believed* to be N–1 secure. He asks clarification on the restoration sequence, specifically whether the DSO load restoration corresponded to the LFDD disconnected load. Donatas Matelionis (ENTSOE) clarifies that LFDD disconnected most of the 2.3 GW of lost load. Once transmission substations were energised, DSOs progressively restored load manually.

Rainer Fronius (VGBE) raises a broader, system level question on how Europe can draw structured lessons from major incidents such as the Czech Republic blackout and the Iberian incident. He asks whether findings from incident investigations can be systematically fed back into the Emergency and Restoration Network Code (NC ER) or whether there is a structured process to translate investigation outcomes into regulatory updates.

Gamze Dogan (ENTSO-E) responds that when investigations produce recommendations, these may include proposals to amend relevant regulatory frameworks, such as NC ER or SOGL. Some past recommendations have already led to changes—for example, amendments to the methodology for coordinating security analysis (CSAM). She emphasises that recommendations are developed case by case, based on the specific insights each incident provide and we cannot conclude that by default all of them will be translated into regulation.

Uroš Gabrijel (ACER) adds that TSOs do not wait for the final report or for formal regulatory revisions. Whenever an incident occurs, any immediately actionable improvements are implemented straight away, provided they do not conflict with existing rules. While investigation teams can recommend legal amendments, the timing depends on the Commission's revision pipeline, which is often heavily loaded. Nonetheless, operational practices, defence plans, and restoration plans can be updated by TSOs without delay, ensuring that lessons learned are applied even before regulatory changes occur.