System Operation European Stakeholder Committee

04 June 2025

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Agenda

1. Opening • Review of the agenda, approval of last meeting minutes • Review of actions	13.00 – 13.15	Uros Gabrijel, ACER Cherry Yuen, ENTSO-E
2. Update on the implementation actions at pan-EU level	13.15 - 13.30	Cherry Yuen, ENTSO-E
3. Report on CGM implementation	13.30 – 13.45	Habir Paré, ENTSO-E
Coffee Break	*13.45 – 14.00*	
4. Probabilistic FCR Dimensioning and FCR by LER	14.00 – 14.15	Luca Ortolano, ENTSO-E
5. Updates from the DSO Entity	14.15 – 14.25	Florentien Benedict, DSO Entity
6. Iberian Peninsula Incident Investigation	14.25 – 14.45	Klaus Kaschnitz, ENTSO-E Richárd Balog, ENTSO-E
7. AOB • Updating the list of members	14.45– 15.00	

1. Review of actions

ENTSO-E, Cherry Yuen

TOP. 1 - Review of actions SO ESC

ACTION	Comments	STATUS
ENTSO-E will present the next update on DFD at the meeting of September.	Materials to be provided separately after RGCE approval.	Ongoing
The European Commission will provide additional information on their inertia study at the next meeting.	Stakeholder workshop delivered.	Closed
Implementation of Art.39 of SO GL and follow-up of RoCoF discussion: ACER will liaise with GC and SO ESC members to establish the Terms of References of the new Expert Group (topic: a macro-economic study is provided by TSOs for adapting system operators to a net zero emissions power system)	EC will initiate a consultation on a forthcoming study which the new EG under GC and SO ESC will aim to support.	Ongoing
ENTSO-E to align with the GC ESC on the online folder that minutes are uploaded (current meeting or previous meeting folder).	Minutes are uploaded in the folder of the meeting.	Closed
Wind Eclipse: ENTSO-E to provide justification on why reserves were reported to being used for events that are in fact forecastable.	E-mail with answers was circulated to stakeholders on 7 May	Closed
ENTSO-E to provide answers to the question of Thierry V. regarding the question on mitigation measures and ramping requirements as RES installations increase.	E-mail with answers was circulated to stakeholders on 7 May	Closed

Topic covered orally

2. Updates on the implementation actions at pan-EU level

ENTSO-E, Cherry Yuen

3. Report on CGM implementation

Habir Paré Nsangou, ENTSO-E

Achievements and on-going actions

Main achievements during the period (February 2025 – May 2025)

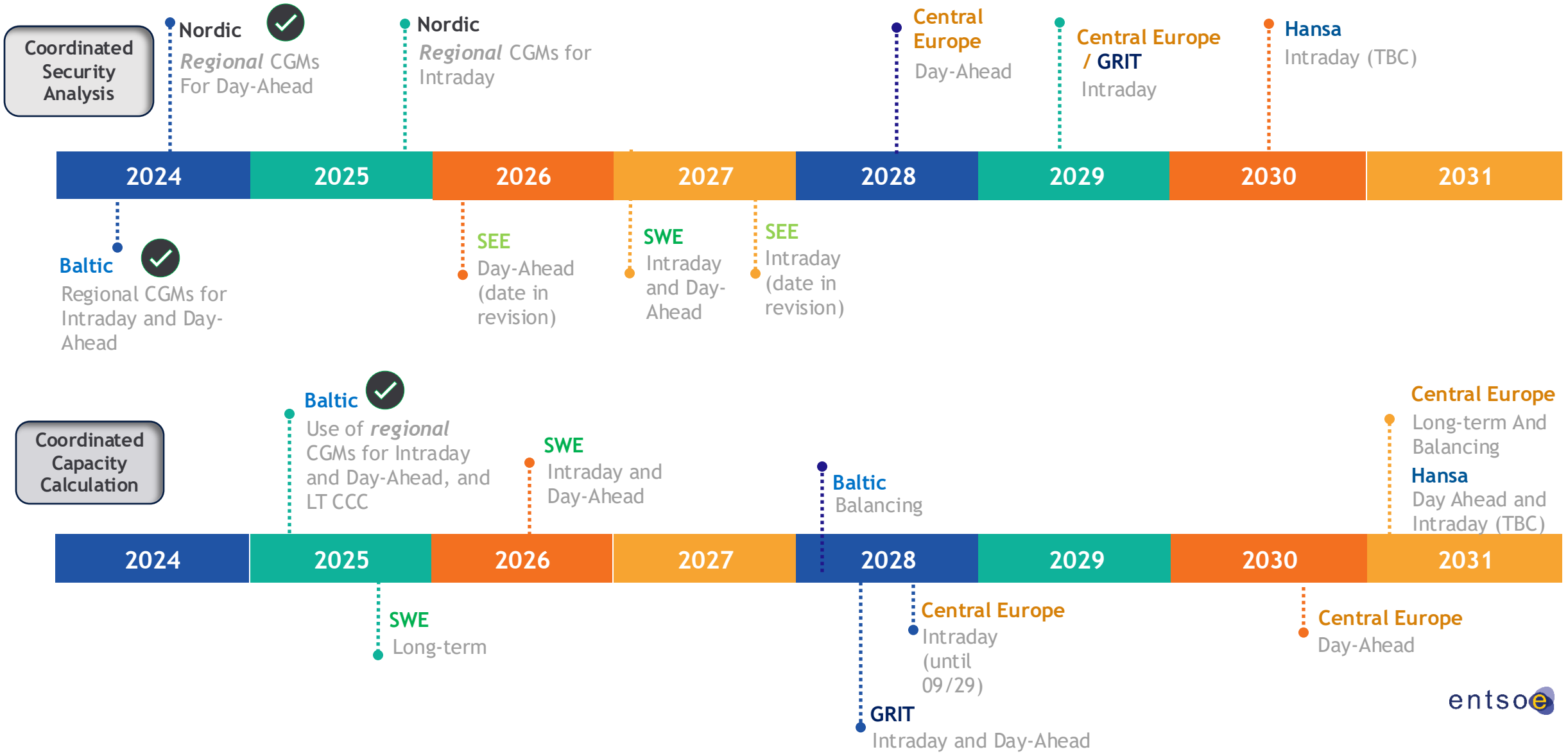
1. **CGM action plan**:
   i. Updated Terms of Reference for the streamlined governance.
   ii. Approved Re-architecture option to support OPDE platform 2.0 *(link with the challenge on OPDE acceptability and use).*
   iii. Approved new Boundary data management application needs to facilitate joint boundary management between Operations and System development needs.
   iv. Successful change of the new CGM building process gate timing
2. **CGM completeness and TSOs/RCCs Inter-Operability Sessions:**
   i. Success on including 32 out of 32 published IGMs into merged CGMs on May Interoperability Testing session.
   ii. Successful launch and maintenance of TSO and RCC issue tracking within dedicated JIRA system.

On-going actions (February 2025 – May 2025)

1. **Dedicated work on EMF benchmarking tasks (e.g. harmonising load flow parameters, replacement strategy).**
2. **Interoperability session best practices to Operational process convergence**

Timeline for CGM-based services go-live

Status 05/2025



4. Probabilistic FCR Dimensioning and FCR by LER

ENTSO-E, Luca Ortolano

Updated on Probabilistic FCR dimensioning and TminLER proposal

- On 17 January 2025, the **CE NRAs approved** the proposal by the CE Transmission System Operators (TSOs) for **probabilistic dimensioning of Frequency Containment Reserves (FCR),** in line with Article 153(2) SO GL.

- The approval process of the Probabilistic FCR Dimensioning methodology at national level is ongoing (to be updated before the meeting).

- The CE TSOs remain available toward the NRAs and the Stakeholders for any further detail or information on the TminLER proposal.

5. Update from DSO Entity

Florentien Benedict, DSO Entity

DSO ENTITY
DSOs FOR EUROPE

EU DSO Entity Updates

ESC SO 4th June 2025

Florentien Benedict

Overview

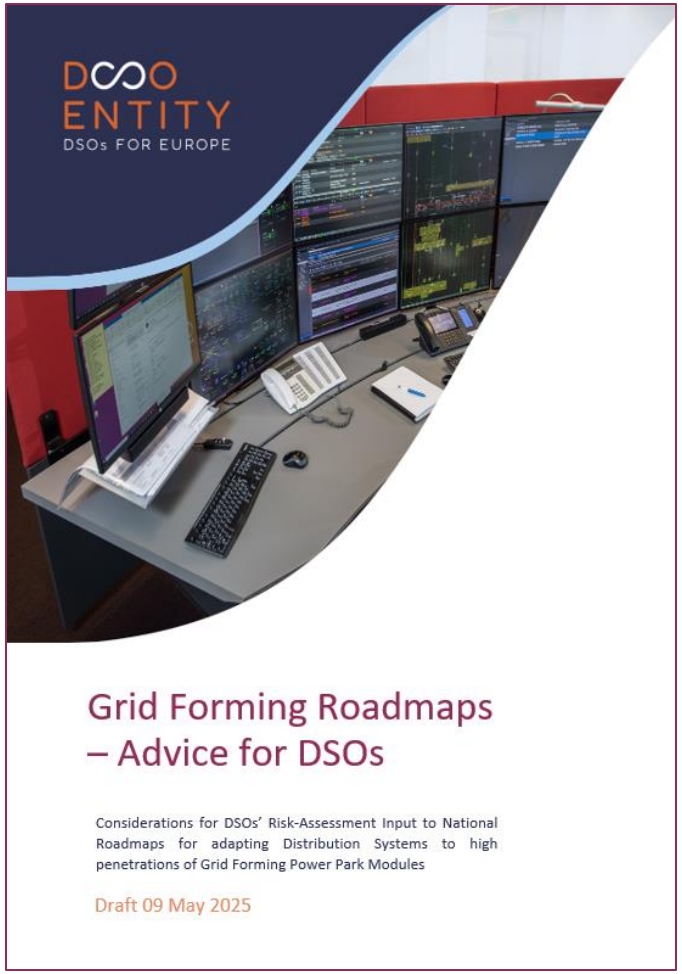
- **1. Grid Forming Capabilities**
- 2. Expert Group on Certification EV, EVSE and HPs
  (Electric Vehicle, Electric Vehicle Supply Equipment, Heat Pumps)
- 3. DSO entity's view of the expected timeline
- 4. SOGL in relation to NC DR and other influences

1. Grid Forming Capabilities

- Supporting Document for DSOs on Grid Forming Roadmaps
- Advice on DSO Risk-Assessment Input to national Roadmaps for adapting Distribution Systems to high penetrations of Grid Forming Power Park Modules
- This document has been written by the EU DSO Entity with the aim of assisting DSOs assess the risks and issues associated with accommodating grid forming power park modules (GFC PPM) within distribution systems

1.A. Support document for DSOs on Grid Forming Roadmaps

- Document shared with ESC CG members and discussed briefly at Match meeting.
- Two comments received during and after meeting and actioned for EU DSO Entity to follow up on,
  - Michael Van Bossuyt – IFIEC
  - Catarina Augusto – SPE.
- Proposed changes/additions to address the issues raised have been communicated to the parties.
- These actions are now closed.



1.B. Support document for DSOs on Grid Forming Roadmaps

- Bi-lateral meeting held with ENTSO-E on 5-5 25 to discuss (inter-alia), ENTSO-e's comments on the document.
- Productive discussions held.
- EU DSO Entity has taken on board majority of concerns raised and have communicated the proposed text changes/additions to ENTSO-E.

1.C - Support document for DSOs on Grid Forming Roadmaps – Next steps

- Following the socialization and changes discussed above, DSO Entity now considers this version to be a final first version.
- The Entity will now consider the timing and nature of socialization to the wider European DSO community.
- This will be informed by the timing of entry into force of RfG V2.0.

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2. Expert Group on Certification EV, EVSE, HPs

- Expert group Certification EV, EVSE and Heat Pumps:
  - Mike Kay, chair
  - Erno Leväniemi and Florentien Benedict, co-chairs
  - 55 experts
- The draft NC RfG 2.0 includes the mandatory certification of vehicle-to-grid EVs and associated EV supply equipment.
- Similarly, the draft NC DC 2.0 requires the mandatory certification of V1G EVs and associated EVSE and heat pumps.
- The balance of work between the two workstreams is currently different:
  - the EV/EVSE workstream is necessarily concentrating on identifying the remaining issues to be resolved that are linked to the relevant standards, to ensure interoperability, whilst expecting to be able to rely on a modified EN50549-10 for most of the NC RfG 2.0 compliance requirements;
  - the HP workstream has been able to concentrate on the testing requirements for NC DC 2.0 as there is no obvious existing EN to link to.
- Although good progress is being made, the expert group believes it still needs answers to some specific issues from the Commission.

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3. DSO entity's view of the expected timeline

- Letter from DSO Entity on our view of the expected timeline for entry into force of the Connection Network Codes 2.0. (17-01-2025)
- We have asked the Commission's help to prevent entry into force to slip any further into the future.
- Without up-to-date European regulations in this area, member states, or even individual system operators, will be forced to adapt in individual and non-harmonized ways.
- For example, member states are already having to develop approaches to accommodate electricity storage at all scales including domestic, electric vehicles, and power-to-gas installations.

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4. SOGL in relation to NC DR and other influences

- EU DSO Entity started up internally the discussion about possible desired amendments for SOGL in the coming future.
- The opportunity arises as a result of the expected changes to other Codes (ie EBGL, NC RfG, NC DC and NC DR)
- To develop approaches to accommodate the operational implications for DSOs, in co-ordination with TSOs, of:
  - electricity storage at all scales including domestic
  - electric vehicles
  - power-to-gas installations

Questions?

Please contact us!

6. Iberian Peninsula Incident Investigation

Klaus Kaschnitz, ENTSO-E
Richárd Balog, ENTSO-E

28 April 2025 incident in the Iberian peninsula

System Operation European Stakeholder Committee meeting | 04 June 2025

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Introduction

- On 28 April 2025, at 12:33 CEST, Spain and Portugal suffered a total blackout. A small area in the South of France (in the border with Spain) was also affected during a limited period of time.

- The rest of the European power system did not experience any disturbance as a result of the incident.

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System conditions before the incident

- **Two periods of oscillations** were observed before the incident:
  - Between 12:03 and 12:07 CEST, triggering oscillations in voltage and frequency.
  - Between 12:19 and 12:21 CEST.

- **Actions were taken to reduce oscillations**.

- **At 12:32 CEST:**
  - There were no oscillations and power system variables were within the normal operation range (to be confirmed after detailed analysis).
  - Spain was exporting 1.000 MW to France, 2.000 MW to Portugal and 800 MW to Morocco.
  - The demand in Spain was around 25,1 GW (3 GW as consumption of pumping hydro power plants).
  - The demand in Portugal was around 5,9 GW (2 GW as consumption of pumping hydro power plants).

Chronology of events during the incident

- From 12:32:57 CET, a series of generation trips were registered, within 20 seconds, in the South of Spain. The total estimated disconnected generation was 2.200 MW. Portugal and France did not observe any generation trips in their control area.

- As a result of these generation trips, frequency decreased and voltage increased in Spain and Portugal.

- The over voltage triggered a cascade of generation losses that caused that the frequency of the Iberian Peninsular power system kept decreasing between 12:33:18 and 12:33:21 CET, dropping down to 48,0 Hz.

- The first level of load shedding was activated at 12:33:20 CET, after the frequency dropped to 49,5 Hz. Over the following 3 seconds, six more levels of load shedding were activated (including stopping hydro-pumping consumption).

- At 12:33:21 CET, the AC tie-lines between France and Spain were disconnected by the action of protection devices against the loss of synchronism.

- The last level of load shedding was activated at 12:33:22 CET.

- At 12:33:24 CET, the Iberian electricity system collapsed completely and the HVDC lines between France and Spain stopped transmitting power.

Restoration process

- As soon as the blackout happened, Red Eléctrica, REN and RTE worked together and coordinated to restore the system in Spain, Portugal and the affected region in France.
- From the beginning, black-start processes were launched in one hydro power plant (Castelo do Bode) and one combine cycle gas turbine power plant (Tapada do Outeiro) in Portugal to initiate the restoration.
- From the beginning, black-start processes were launched in several hydro power plants in Spain to initiate the restoration. Restoration was also launched from France and Morocco.
- At 12:44 CET, a first interconnection overhead line between Spain and France was re-energized (West side of the border).
- At 12:45 CET, Castelo do Bode energizing the 220 kV of neighboring REN's substation
- At 13:04 CET, the interconnection between Spain and Morocco was re-energized.
- At 13:35 CET, Eastern interconnection between France and Spain was re-energized.
- At 16:11 CET, new startup of Castelo do Bode and at 16:31 CET first consumers connected
- At 16:38 CET first startup of Tapada do Outeiro and at 17:26 CET second and successful attempt to start with supply of consumers.
- At 18:36 CET, a 220 kV tie-line between Spain and Portugal was re-energized. 3 hours later, the Southern 400 kV tie-line between both countries was also re-energized.
- At 00:22 CET of the following day, the restoration process was completed in Portugal.
- Around 04:00 CET, the restoration process was completed in Spain.

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Classification of the incident

Based on the Incident Classification Scale (ICS) Methodology
established in accordance with EU Regulations 714/2009 and 2017/1485 (SOGL)

Country	Lost load* (MW)	Load before* incident (MW)	Percentage %	Scale
France	<10	47 700	0	0
Portugal	5 900	5 900	100%	**OB3**
Spain (continental)	25 200	25 200	100%	**OB3**

This incident is classified at **Scale 3**, which is the **most severe level** based on ICS criteria

*Load from pump storage is not considered

Table 2 Thresholds by scale for incidents on load

	CE	Nordic	GB	IRE/NI	Baltic
Scale 0	Loss of less than 1 % of load in a TSO's control area				
Scale 1 L1	Loss of >1 to ≤10% of load in a TSO's control area				
Scale 2 L2	Loss of >10 to ≤50% of load in a TSO's control area				
Scale 3					

Blackout (OB)

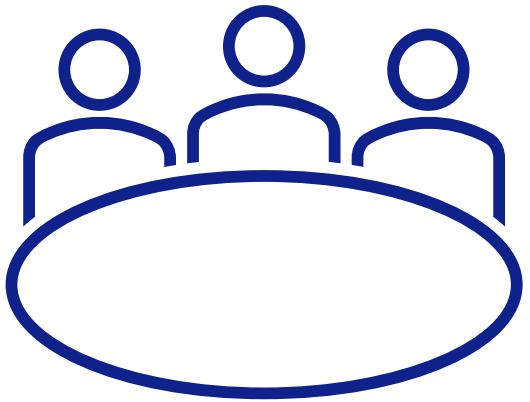
General description

After the incident occurs, the system is in blackout state. Blackout is only counted on scale 3 (OB3). An incident is classified according to this criterion in case one of the following conditions from SO GL article 18(4) is fulfilled:

- loss of more than 50% of demand in the concerned TSO's control area; or
- total absence of voltage for at least three minutes in the concerned TSO's control area, leading to the triggering of restoration plans.

Expert Panel : role and composition

- The Expert Panel is a body legally mandated by the ICS methodology to investigate technically any major grid incidents (Scale 2 and 3).
- The composition of the Expert Panel is determined by the ICS methodology.
- The Expert Panel for the 28 April 2025 incident is co-led by K. Kaschnitz (APG, Austria) and R. Balog (Mavir, Hungary). It includes **43 members** from:
  - ENTSO-E
  - TSOs and RCCs of:
    - Denmark
    - France
    - Germany
    - Greece
    - Ireland
    - Italy
    - Poland
    - Portugal
    - Romania
    - Spain
    - Switzerland
  - ACER
  - NRAs of:
    - Belgium
    - Czech Republic
    - France
    - Germany
    - Hungary
    - Italy
    - Poland
    - Portugal
    - Romania
    - Spain
    - Sweden
    - Switzerland



Expert Panel : 2 main deliverables

Establishment of the Expert Panel

- Kick-off meeting on 12 May 2025
- Next meetings planned on
  - 3 June
  - 23 June
  - 15 July

First deliverable: Factual report

- Presents the **facts and data** about the incident
- Does not include analysis nor recommendations
- Legal deadline for the factual report : 6 months after the incident
- The Expert Panel intends to deliver the factual report much earlier than the legal deadline

Second deliverable: Final report

- Is prepared on the basis of the Factual report
- Includes a detailed analysis of the incident
- Includes a list of **recommendations** to be implemented in order to prevent similar incidents in the future
- Is usually published 2-3 months after the factual report

Reporting at each Electricity Coordination Group meeting

7. AOB