System Operation European Stakeholder Committee

06 October 2026



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Reliable Sustainable Connected

Draft Agenda for October meeting

Subject	Timing	Lead
Lunch	12.00 - 13.00	
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 - 13.20	Cherry Yuen, ENTSO-E
3. Outage Planning Coordination	13.20 – 13.30	Anuhya Chen, ENTSO-E
4. Updates from the DSO Entity	13.30 – 13.40	Florentien Benedict, DSO Entity
5. AOB	13.40 – 14.00	Joao Moreira, ENTSO-E
6. SO ESC/GC ESC joint session 6.1 Inertia project phase 2 – Conclusions 6.2 SO ESC/GC ESC – EG boilerplate ToR 6.3 ToR EG on non-observable embedded generation	14.00 – 15.15	Joao Moreira, ENTSO-E Uros Gabrijel, ACER Florentien Benedict, DSO Entity & Cherry Yuen, ENTSO-E

1. Review of actions

ENTSO-E, Cherry Yuen

TOP. 1 - Review of actions SO ESC

ACTION	Comments	STATUS
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 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).	The next milestone is to have CGM build process ready for operational tasks in Q3 2028.	Ongoing
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.	Link here.	Done
ENSTO-E to present the conclusion of the project Inertia phase 2 and the next steps when phase 2 is finalised.	Please see agenda item #6	Done

TOP. 1 - Review of actions SO ESC

ACTION	Comments	STATUS
The stakeholders to review the latest ICS methodology (ICSm) and ALFC reports in order to identify whether meaningful insights on the frequency behaviour could be brought forward for discussion within the SO ESC. To be provided in advance for ENTSO-E to coordinate internally to be prepared for the October meeting	No insights/questions submitted so far	
Include outage planning coordination on the agenda of October SO ESC meeting	Please see agenda item #3	Done
ACER to communicate the next steps on the TminLER for the decision-making process		
ENTSO-E to organise a dedicated discussion involving the European Commission, ACER and DSO Entity to address governance aspects related to implementation of recommendations and report the outcomes of the discussions to the SO ESC.	Preliminary discussions initiated with EU DSO Entity and a dedicated call organised on 28 September 2026	Ongoing

TOP. 1 - Review of actions SO ESC

ACTION	Comments	STATUS
R250428_11 from Iberian Blackout: ENTSO-E and DSO Entity to i) jointly draft the ToR for the expert group; ii) consider launching a survey to gather stakeholder input to support the drafting process, including on scope and objectives; Draft ToR to be circulated ahead of the next joint ESC meeting, where the establishment of the expert group will be further discussed.	Preliminary discussions initiated with EU DSO Entity	Ongoing

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

ENTSO-E, Cherry Yuen

To be updated

Pan-European or regional deliverables 2026: SOGL/NCER

ICS	Expert Panel Final report on 4 July incident in Czech Republic - link
SO GL art.16	Load Frequency Control – Annual report 2025 - link

3. Outage planning coordination

ENTSO-E, Anuhya Chen

Coordination of Regulatory Engagements

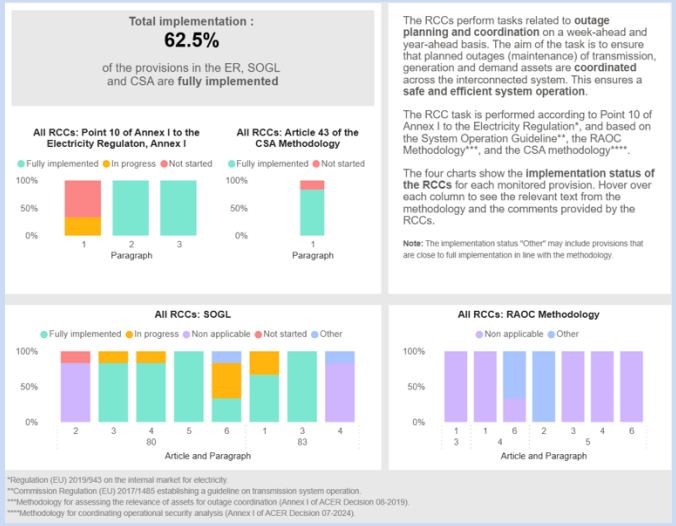
Energy Union Task Force (EC, ACER, NRAs, etc.)

Task Force to discuss and govern implementation of mid-term measures to increase CZC.



Compliance Inquiry for the tasks OPC & STA

Assessment of status of implementation of the task by RCCs.
Visualization within Dashboard (LINK), and results included in the Monitoring report.



RCC Monitoring Reports

March 2025:

- Production units & demand facilities
- Maximization of CZC

December 2025:

- Generation & load assets
- Maximization of CZC
- Advanced Security Analysis
- RCC Recommendations
- RAOCm Analysis



Energy Union Task Force (EC, ACER, NRAs etc.,)

EU TF task for ACER

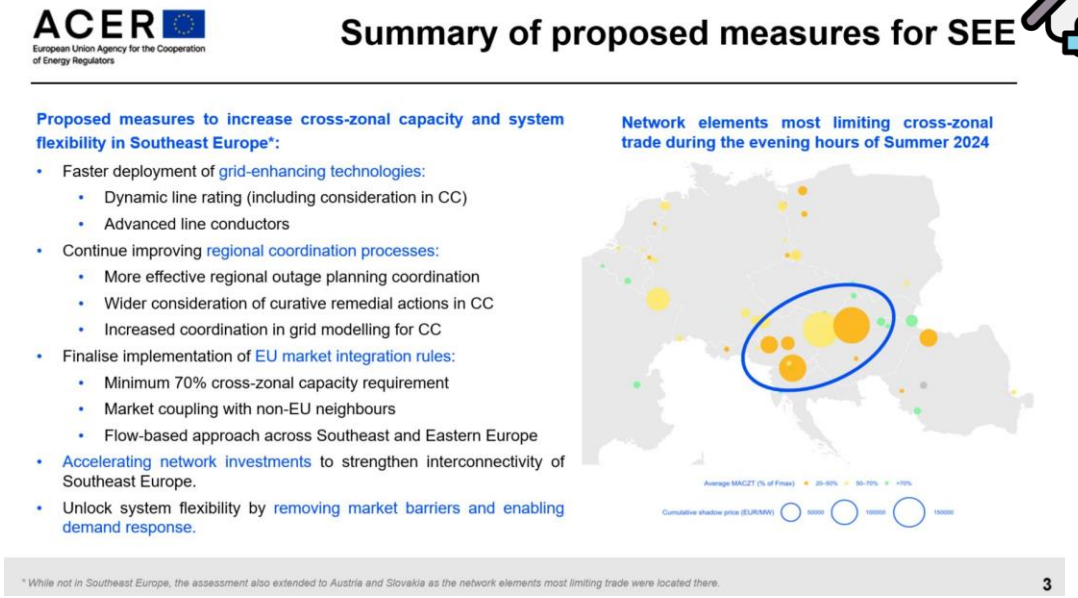
- explore the feasibility of implementing measures to increase cross-zonal capacities and flexibility, driven by price spikes in SEE (during summer 2024)
- Primary focus is SEE+; assessing short-term measures to prevent or mitigate their reoccurrence
- Report with findings published on **20.05.2026**

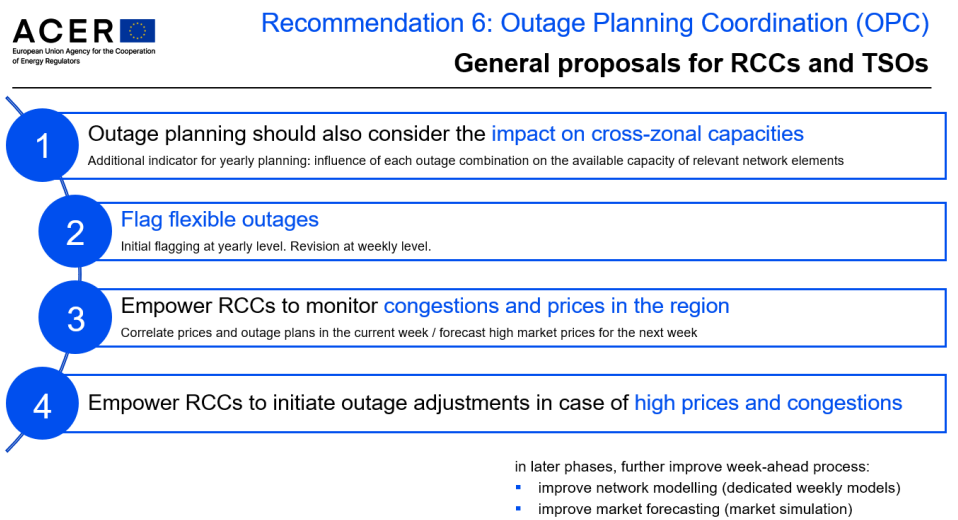
Proposals by ACER for OPC

- Consider elements of Capacity Calculation in OPC
- Flagging of flexible outages, No related to infrastructure dev.
- Enable RCCs to monitor the congestions and prices in the region
- *Clarification from ACER: Proposed capacity calculation indicators to be added are not considered as a prevailing criterion in outage planning or re-planning*

Material:

Energy Union TF 2025 Report (LINK) --> Increasing Cross Zonal Capacity and system flexibility in Southeast Europe





Coordination of Regulatory Engagements

Latest updates

- **May 2026:** Publication of ACER report to EUTF discussing measures to increase CZC in Southeast Europe LINK
- **June 11:** In Market Stakeholder's Committee (MESC) ACER presented the key findings from the published report. In reaction ENTSO-E position on the proposed measures from PT Art 16 was presented.
- Good collaboration on all participants was extended.
- Recommendations planned to be extended to further regions (currently on SEE and CE)
- ACER mentioned that 70% min RAM and DLR will become part of the regular ACER market monitoring report and no ranking of measures is feasible

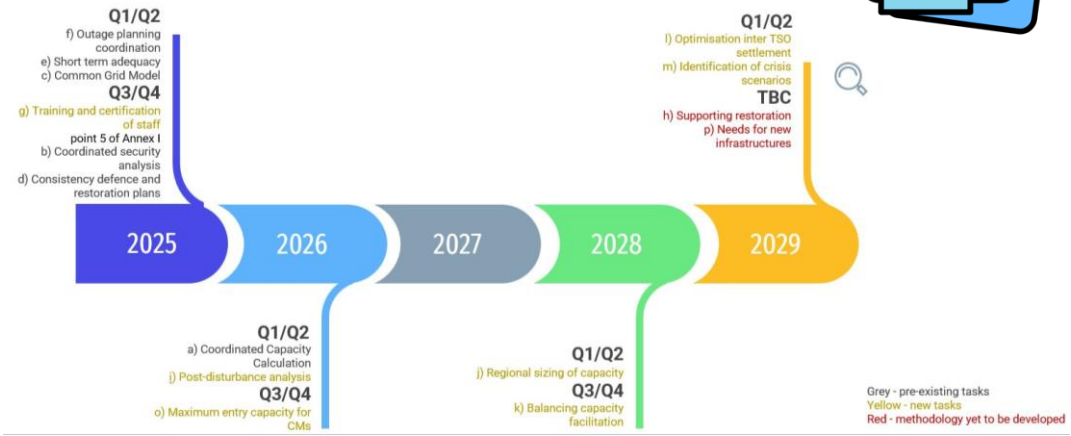
Next Steps

Follow-up discussions with ACER and OPC experts expected to refine implementation requirements in conjunction with the other regulatory topics such as Compliance enquiry, RCC monitoring report

ACER Compliance Inquiry



Context: Since the beginning of 2025, ACER is executing a compliance inquiry towards RCCs, to assess the status of implementation of relevant tasks. Art.37.1 IME, task e) **STA** in March 2025 (LINK), Art.37.1 IME, task f) **OPC** in June 2025 (LINK).

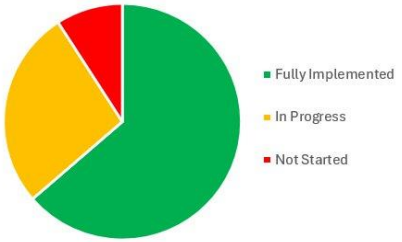


Past activities:

Jan 2026: Common response from all RCCs submitted to ACER (acknowledged)

- Highlighted preference for a procedural solution: **High-level business process** embedded in the Regional Coordination Operational Procedure (RCOP) under SO GL Article 83.1.
- No formal methodology is proposed, as RCCs are not responsible for developing regulated methodologies and this would exceed feasible timelines.

Action	Description	Who	When
Methodological approach to maximize the CZ capacity	RCCs to make available the methodology to maximise cross-zonal capacity in the OPC assessment	RCCs	Suggestion: **21 November 2026**
Understanding of the inputs TSOs use	RCCs attempt to get a more detailed understanding from TSOs on the points listed under point (11) in the minutes: • Which of the elements (listed in points (a) – (e) of Article 5.3 of the Methodology for assessing the relevance of assets for outage coordination) does the TSO include in its proposition of relevant assets? • Does the TSO include in its proposition of relevant assets any of the assets outlined in points (a), (b) and (c) of Article 5.4 of the same Methodology. If so, which? • Does the TSO complement the list with critical network elements identified in accordance with the CACM regulation? (Article 5.6 of the Methodology) • Does the TSO use dynamic studies for assessing the influence of elements? (Article 4.1 of the Methodology)?	RCCs	Suggestion: **12 December 2026**



Coordination of Regulatory Engagements

Latest updates

June 2026 – Ljubljana WG Reporting

- ACER confirmed a preference for a **business-process based implementation** rather than a formal RCC methodology.
- Common RCC approach supported to ensure consistency across regions.
- Further procedural details to be developed jointly by RCCs, TSOs and regulators.
- ACER recommendations continue to reference findings from the EU Task Force and SEE price-spike reports

June 2026

Dedicated call with ACER on recommendations in RCC monitoring report with OPCSTA TF Business

Next Steps

- Align on OPC position across TSOs and RCCs and assess the Nov. 2026 feasibility
- Clarify inclusion of SGU scope and consolidate open points and engage with ACER in targeted follow-up sessions where needed
- Sept. 2026 : ACER launched a second round of Monocle tool monitoring exercise for RCC task for OPC. Focus on implementation aspects , scope of RAs.

4. Updates from the DSO Entity

DSO Entity, Florentien Benedict

DSO ENTITY
DSOs FOR EUROPE

DSO Entity Overview



Florentien Benedict
SO ESC

06 October 2026

Content

1. DSO Entity - Key Actions in 2026 on System Operations
2. ICS methodology – Asks for full integration of DSOs
3. ICS Methodology – Further Development of the ICS Methodology

1. DSO Entity - Key Actions in 2026 on SOGL (1/2)

A. In response to ACER's informal request, DSO Entity has prepared **a dedicated paper for ACER in 2026** and for discussion/co-ordination with Stakeholders.

B. The paper contains several key points, the key points are **extracted from general insights and preliminary recommendations after study Iberian Blackout**

C. The paper has **14 key points**, but split between the three broad areas of :
   1. Data
   2. System operation
   3. Inclusion of new technologies

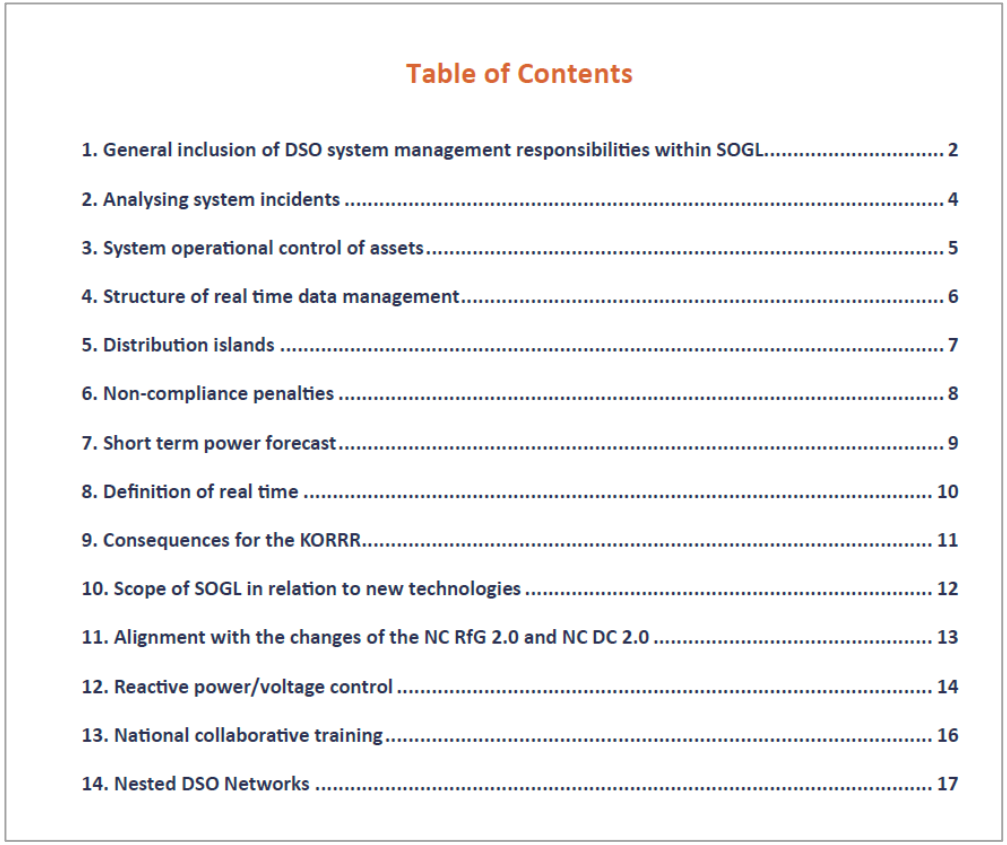


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DSO Entity is fully engaged in reviewing the SOGL 2.0

1. DSO Entity- Key Actions in 2026 (2/2)

Collaboration is key for an active system management

1. **The existing SOGL concentrates on the needs and rights of TSOs** for overall system operation, including obligations on DSOs and on significant grid users (SGUs) connected to DSO's networks.
2. **For DSOs to play their part** in the energy transformation, in line with DSO Entity's technical vision for serving customers through **active system management**, flexibility, energy sharing, the legal framework, of which SOGL is a key part, **SOGL needs to be updated and needs to give DSOs the necessary rights and responsibilities**.

Strengthened DSOs' Role in future SOGL Revision
Ensuring Full Collaboration with All Stakeholders

2. ICS methodology – asks for full integration of DSOs

1. DSO Involvement

1. The revised SOGL should include all relevant obligations and rights for DSOs which are needed to:
   A. recognize the growing importance of distribution system operation, given the phenomenal growth of flexible renewable resources on distribution systems;
   B. the emerging DSO smart grid capabilities; the new behaviors required of low carbon technologies (eg EVs and heat pumps);
   C. DSOs' new coordinated legal responsibilities.

2. Analysing system incidents

Key ask! Include DSO Entity/ DSOs in the next expert panels analyses on system incidents



3. ICS methodology – Further Development of the ICS Methodology

- **The ICS methodology is closely linked to the SO GL framework and the monitoring of system operation**

Article 15 - Annual report on operational security indicators

1. By 30 September, ENTSO for Electricity shall publish an annual report based on the incidents classification scale adopted in accordance with Article 8(3)(a) of Regulation (EC) No 714/2009. The Agency may provide its opinion on the format and contents of that annual report, including the geographical scope of the incidents reported, the electrical interdependencies between the TSOs' control areas and any relevant historical information.

SO GL (Regulation (EU) 2017/1485)

"on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003"

Article 8 - Tasks of the ENTSO for Electricity

...

3. The ENTSO for Electricity shall adopt:

a) common network operation tools to ensure coordination of network operation in normal and emergency conditions, including a common incidents classification scale, and research plans;

Art. 30(1)(i), Regulation (EU) 2019/943; see also Art. 15, Regulation (EU) 2017/1485 (SO GL).

Need to Revise the ICS Methodology
Ensuring Full Collaboration with All Stakeholders

DSO ENTITY
DSOs FOR EUROPE



Thank you for your attention
Questions?
Please contact us!

5. Inertia Project phase 2 - Conclusions

ENTSO-E, Joao Moreira

Project Inertia Phase II – Background summary

Milestone I – Public Report (November 2023)

Milestone II

ENTSO-E Position Paper and supporting technical report (January 2025)

- **Assess the resilience of the continental European (CE) system to withstand system splits, under future scenarios, given the threat of reduced levels of total system inertia and increased power transfers through the electricity system**
  - Number of theoretical system split cases where both split subsystems exceed the ±1 Hz/s operational threshold potentially leading to a total blackout (Global Severe Splits) shows a significant increase from 2030 to 2040 studied scenarios
- **Recommended to counter the progressive decrease in system resilience presenting possible solutions and mitigation measures in a structured approach, defining and characterising foundational and enhanced response measures**
  - Proposed balanced effort metric (Hmin) on the allocation of inertia at control area level to limit the decline of the system resilience in case of system splits
  - Proposed roadmap to deliver a secure and efficient future-ready decarbonised system as part of a pragmatic step-by-step, no-regret approach to monitor that decline, quantify the gaps and guide proportionate measures
- **The accepted level of grid resilience and accepted risk of blackout must involve the relevant institutions and stakeholders as it is not for the Transmission System Operators (TSOs) only to define these aspects**

Milestone III – Summary and conclusions

Summary of Project Inertia based on already published results and recommendations

Additional clarifications resulting from received external and internal feedback, promoting a shared understanding regarding the resilience recovery effort and its context to further support decision-making on solution measures

Report does not constitute the common study by all TSOs of the CE synchronous area to identify whether the minimum required inertia needs to be established in accordance with Article 39(3)(a) of SOGL.

Way forward RGCE decision to explore pathways for implementation with input provided from Project Inertia

Important aspects to keep in mind and way forward

❑ Scope of proposed solutions – the project focuses on system splits and inertia

- **Not all Globa Severe Splits (GSS) situations or other split situations where one subsystem could experience blackout can be avoided**
  - **Avoiding a significant number of GSS situations is** not a complete solution or definitive metric per se, but, as a minimum, **a very important reference of the resilience of the system** that should be safeguarded
- **Project Inertia Phase II does not propose a security metric it proposes a balanced effort metric (Hmin) on the allocation of inertia. As explained Hmin metric is assessed ex-post.**
  - **Under no circumstances should the results be interpreted, nor are they defined, as system security criteria that TSOs must guarantee during real-time system operation**
- **All possible enhanced measures, on top of the foundational measures, that can contribute to recover the system resilience in case of system splits should be considered** (e.g. special protection schemes, fast frequency response measures)
  - The study does not propose, in any circumstance, decisions on RES limitation or redispatching of RES
  - Project focus is **inertia**, but **is not the only parameter relevant for stability**: addressing inertia does not hinder other needed solutions

❑ Pathways for implementation being taken forward by SOC under RGCE

Project Inertia recommendations

❑ Resilience targets defined for the short/medium-term and long-term. Project Inertia proposes:

As soon as possible

- Any device able to provide inertia like ESMs, E-STATCOMs, Synchronous Condensers and PPMs shall provide inertia.
- RfG 2.0 IGDs to support TSOs in defining adequate technical requirements

In parallel

- Always pursue optimisation of enhanced response measures and preventive measures.

By 2035

- Reach Hmin= 2 sMW/MVA in **50% of time** in a year **by control area**.
- For the first steps, part of the targets can be largely ensured with **technologically available TSO assets**.

Long-term recommendation

- Subject to reassessment based on the return of experience, where a stepwise gradual increase can occur
- Reach Hmin = 2 sMW/MVA in **90% of time** in a year.
- Such total kinetic energy does not exceed the total kinetic energy levels available in the past for CE.

First target is not the ultimate solution but a pragmatic first step in a necessary but challenging process. Long term recommendation can be met stepwise, in a progressive manner, depending on return of experience, reassessment and fine tuning.

❑ Regular reassessment of inertia support reccomendations and guidance for proportionate measures combines ex-post operational information and long-term planning perspective

- Actual coverage of Hmin metric to be regularly reassessed via ex-post operational monitoring
- Long term inertia support and global resilience level to be reassessed as part of the regular TYNDP process

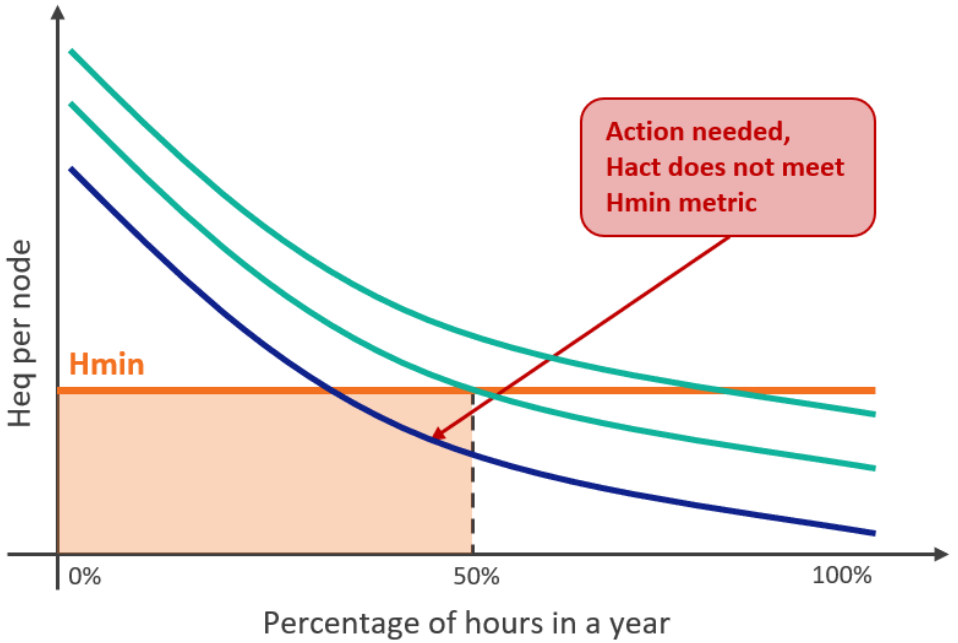
Hmin metric: Recovering system resilience is a common effort

A balanced effort approach for all control areas

❑ Bottom-up H_{min} metric

- H_{eq} duration curve is calculated using the system's base power, ex-post or based on future scenario
- Duration curve will be checked against H_{min} ;
  - if below H_{min} at the required percentage of the time in a year, foundational measures are recommended
- The foundational measures to meet the applicable H_{min} at the required percentage of the time in a year should be implemented consistently by the relevant TSO.
- **Metric is based on a full year duration curve; no conclusions can be taken from a single point in time.**

Duration curve of Hact in a full year compared with Hmin metric

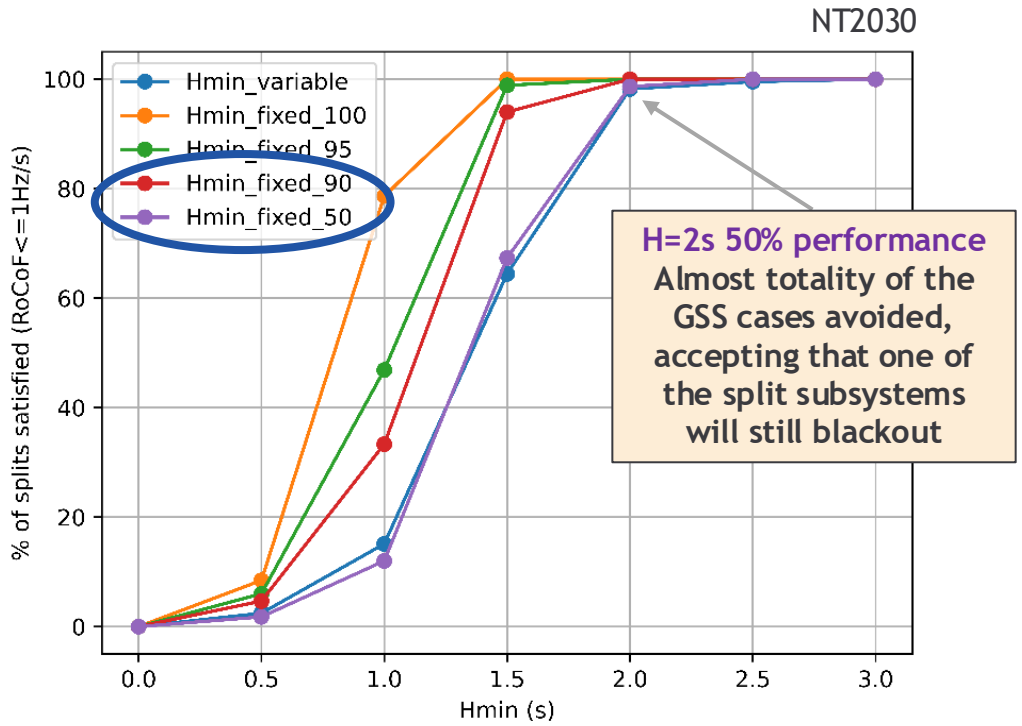


Inertia from a system perspective:

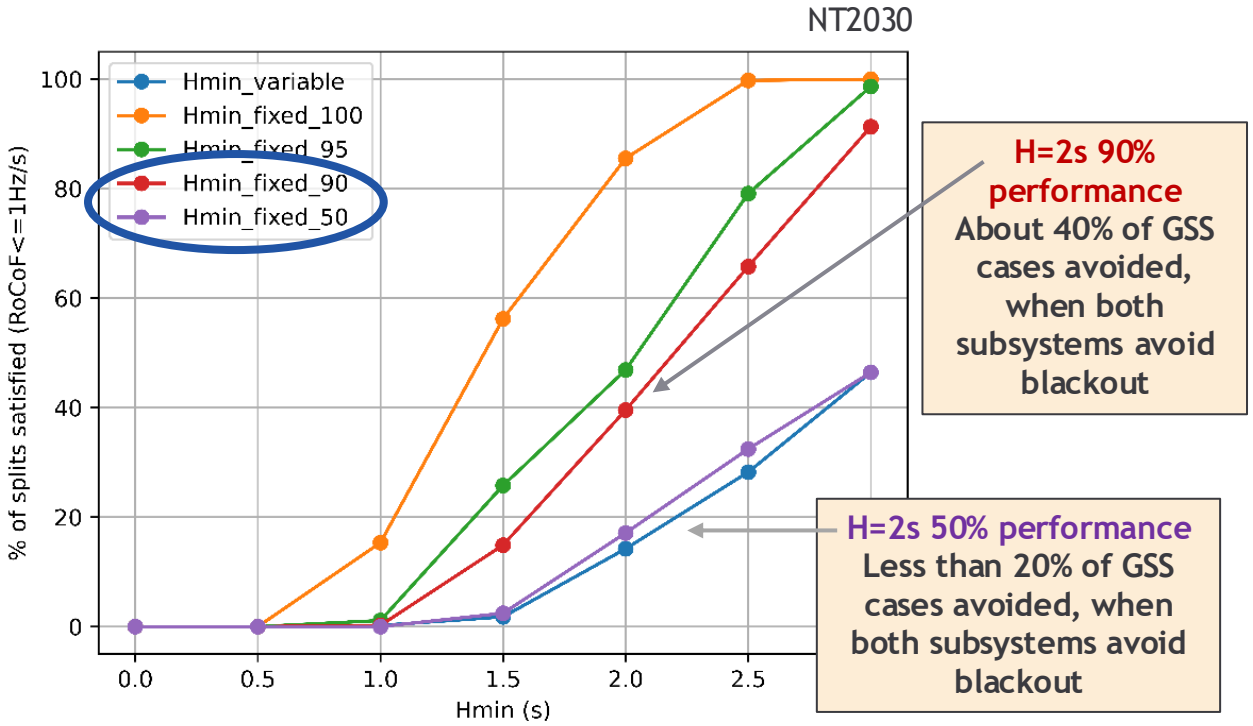
- **Kinetic energy E_{kin} (MWs)**, a summation of the kinetic energy contribution of each individual synchronous machine and other devices providing synthetic inertia. Further improvements could integrate the contribution from loads.
- **Equivalent inertia time constant H_{eq} (MWs/MVA),** the ratio of the kinetic energy E_{Kin} (MWs) and the system's equivalent base power resulting from online generation S_{Base} (MVA): $H_{eq} = \frac{E_{Kin}}{S_{Base}}$.

Hmin metric: Assessment of performance for Global Severe Splits (GSS)

Hmin = 2 s, 50% proposed as an initial target providing a balanced trade-off between effort and performance – NOT a security metric that prevents all blackouts!



A or B avoid |RoCoF| ≥ 1 Hz/s

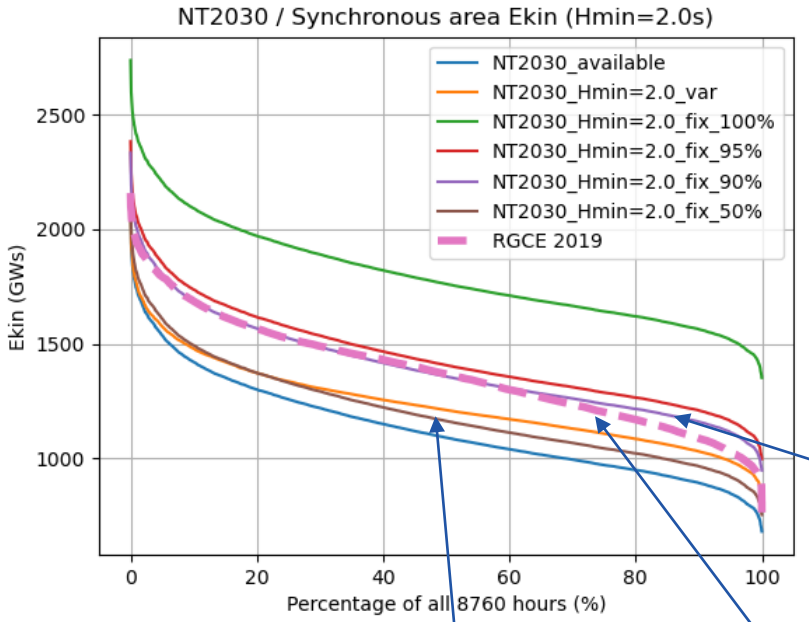


A and B avoid |RoCoF| ≥ 1 Hz/s

Assessment of GSS cases avoided – Situation in split subsystems A and B

Hmin metric: Overview of global recovery effort based on Hmin = 2 s

Total equivalent kinetic energy to meet Hmin = 2 s target remains below or close to historic 2019 levels – No over-dimensioning of the system



- Hmin = 2 s with 50% approach represents a pragmatic no-regret option for 2035
- Both Hmin = 2 s and with 50 or 90 % quantile leads to quite similar kinetic energy duration curves compared to the existing levels in the year 2019.
- Feasible and realistic technology-neutral solutions may include, e.g., SCs and appropriately controlled batteries configured to provide GFM and inertial-response capabilities

Overall H = 2 s, 90%
(Additional 270 GWs to
NT2030 baseline scenario)

Overall H = 2 s, 50%
(Additional 73 GWs to
NT2030 baseline scenario)

RG CE 2019

AOB