System Operation European Stakeholder Committee

Materials for meeting 15 March 2023

entsoe

Reliable Sustainable Connected

Agenda

Subject	Timing	Lead
1. Opening • Review of the agenda, approval of last meeting minutes • Review of actions	14.00 - 14.15	ACER, Uros Gabrijel ENTSO-E, Cherry Yuen
2. Update on the implementation actions at pan-EU level	14.15 - 14.30	ENTSO-E, Cherry Yuen
3. RoCoF Presentation	14.30 - 14.45	EUTurbines, Luca Guenzi
4. Update on Winter 22/23 preparation • Operational coordination	14.45 - 15.00	ENTSO-E, Laurent Rosseel
5. Report on CGM Implementation	15.00 - 15.15	ENTSO-E, Habir Paré
6. Update on Tmin FCR LER • LLEFD (Long-Lasting Extraordinary Frequency Deviation)	15.15 - 15.25	ENTSO-E, Luca Ortolano
7. Cybersecurity Network Code – Status update	15.25 - 15.40	EC
8. AOB •	15.40 – 15.30	All

1. Review of actions

ENTSO-E, Cherry Yuen

1 Review of actions SO ESC

ACTION	ANSWER	STATUS
vRES generation vs DfDs (wind eclipse): ENTSO-E to internally coordinate for this work and to form a dedicated group with stakeholders	Work is on hold due to TSO resources focused on winter crisis, work to resume when resources are freed up	On-hold
KORRR amendments: ENTSO-E to organize bilateral meeting with EU DSO Entity, involving also ACER	EU DSO Entity has prioritised their effort on the current CNC amendments	On-hold
LLEFD (Tmin FCR LER): stakeholder workshop early 2023	Pending due to discussions with NRAs Next steps to address NRAs' request to be presented in meeting on 15th March	Ongoing
ENTSO-E, ACER, EU DSO Entity and European Commission to discuss the sequence of amendments to the grid connection codes and operational codes	Discussion pending	Ongoing
RoCoF: ENTSO-E to take the point raised by EUTurbines on RoCoF and check with experts in inertia	First findings to be given by ENTSO-E co-convenor in meeting on 15th March	Ongoing
Admin: ENTSO-E to distribute the member list for final check/approval by everyone in order to update the website accordingly	List updated in website	Done

Action on RoCoF and inertia

- By default, system split events are emergency situations (NC ER) which are not governed by SO GL
- SO GL art. 39 stipulates the requirement of analysis on the need of minimum inertia, with the assumption of an interconnected system (no system split)
- The recent publication from ENTSO-E concludes that the current system defence plans are sufficient to maintain a stable, interconnected system without the need to impose minimum inertia
  - Link: Microsoft Word - System Defence Plan_v8_final (entsoe.eu)
- In futuristic system split scenarios, whose probability and severity is expected to increase, the local RoCoF could likely exceed the 1Hz/s value: in various ENTSO-E technical publications, improving the withstand capability of power generation units, among others, is listed as one of the key measures to avoid cascading effects leading to blackout of the split sub-systems
  - Link (p.9): FREQUENCY STABILITY IN LONG-TERM SCENARIOS AND RELEVANT REQUIREMENTS (azureedge.net)
  - Link (p. 45): Microsoft Word - Inertia and RoCoF_v17_clean (azureedge.net)

2. Update on the Implementation Actions at pan-EU level

ENTSO-E, Cherry Yuen

Pan-European or regional deliverables 2023: SOGL/NCER

CSAm (Article 44.5)	Secure data collection and validation platform being set up for the PRA (Probabilistic Risk Assessment) methodology expected in 2027 – annual TSO data collection process ongoing - Biennial report expected Q4 2023
KORRR amendments	Pending discussions with EU DSO Entity, involving also ACER Revised version taking into account feedback received from stakeholders will be shared after conclusion
Operational Agreements	Ukraine/Moldova: Discussions and work ongoing Impact on Continental Europe Synchronous Area after synchronisation is closely monitored and reported regularly to ACER and NRAs

3. RoCoF Presentation

EUTurbines, Luca Guenzi

EUTurbines
RoCoF amendment - SPGMs constraints

Online

16 March 2023

Topics

1. Sum-up of the discussions
2. ROCOF containment as common target in CNCs
3. Conclusion

Status of…

…since last GC ESC in 2022

- 2 x multilateral web conferences with Eurelectric, VGBE and ENTSOE
- Presentation of technology physical constraints for big units which cannot be overridden, mainly:
  - Risk of loss of synchronism when considering certain generator and grid conditions (SCP),
  - Risk of severe damages for high RoCoF value
- Presentation of result of simulation studies
- Definition of possible way forward… expected next follow up meeting with ENTSOE, VGBE, Eurelectric and ACER

Sum-up of discussions

EUTurbines presented the results of extensive studies:

- Studies are focused primarily of RoCoF values and use RoCoF values/profiles as stated by TSOs (focusing first on the 2Hz/s profiles included in the IGD and the values proposed by ENTSOE as an amendment proposal)
- Grid characteristics used for the studies are based on a very wide range of SCP (Short Circuit Powers) provided by various TSOs
- The studies based on this wide range of SCPs show that RoCoF values for generating units with big inertia could not exceed 1Hz/s during 500ms, if the machine is expected to remain connected to the Grid
- The findings are in line with the conclusion of the KEMA-DNV report “RoCoF - An independent analysis on the ability of Generators to ride through Rate of Change of Frequency values up to 2Hz/s”
- For big generating units the way RoCoF requirements need improvement
- RoCoF requirements also cannot be considered the same for high inertia generating unit/grid areas and low inertia generating unit/grid areas

Sum-up of discussions

Grid SCP and FRT

- Short Circuit Power (SCP) grid characteristic is being discussed:
  - Certain TSOs commented that assumptions considered for simulations were not realistic: “too low SCP values for which the units would not comply with requirements for Fault-Ride-Through (FRT)”
  - On the other hand, others commented that EUTurbines assumptions were realistic to them, and emphasized the very likely erosion of SCP in the grids in the future
  - SCPs considered by EUTurbines for the studies so far are based on real values provided by various TSOs in Europe (in ‘connection agreements’) during tendering and execution stages of real projects
  - Reference to German SCP requirements rule (SCP = 6 times the generating unit active rated power) does not seem to be achievable, as per EUTurbines simulation results shared during the last ENTSOE call.
  - EUTurbines is open to perform additional simulations based on SCP values provided by ENTSOE.
- The big inertia of the large turbogenerator units is the reason why ROCOF values beyond 1Hz/s cannot be handled without disconnection from the grid. Indeed, simulations show clearly that, due to the very high kinetic energy (MWs values) stored in these shaft-lines, more severe assumptions would result in pole slips in many operating conditions
- ROCOF containment is considered top-priority element for the power quality of the system. It is a must-have for frequency stability, therefore lower ROCOF value than 2Hz/s is highly desirable
- Big Generating units are key elements for the stability of the system. Indeed, it is their inertia that prevents higher RoCoF values!
- The physical features of these big turbogenerator units shall be considered when defining requirements applying to this type of units

Sum-up of discussions

AVR contribution

- It was commented that the AVR contribution has been neglected in EUTurbines simulations
- It was estimated that AVR parameters optimization would only provide very limited to no contribution in improving the RoCoF withstand capability
- The contribution of the AVR is discussed also in below IEEE report and KEMA report, which both are in line with EUTurbines approach

IEEE Power & Energy Society
Report on Coordination of Grid Codes and Generator Standards:
Consequences of Diverse Grid Code Requirements on Synchronous Machine Design and Standards

DNV KEMA
RoCoF
An independent analysis on the ability of Generators to ride through Rate of Change of Frequency values up to 2Hz/S

Sum-up of discussions

EUTurbines requested that ENTSOE:

- Present the status of countermeasures for RoCoF containment (already requested in all previous requests)
- To study real RoCoF values associated with big generating units or in general for units with inertia, and not as a general average value for all technologies

As yet, ENTSOE has not presented any documentation in response to these requests

EUTurbines highlighted the very high cost of providing ‘synthetic inertia’ with Power Electronic converters, when compared to inertia provided with mechanical rotating masses (refer to paper “A1-102_The benefits of implementing Synchronous Compensators in grids with high penetration of Renewables”).

Next Steps

- Follow up on technical discussion (including ENTSOE expected actions)
- Presentation of possible way forward (text amendment proposals); derogation proposal is not desirable, but clear exception proposal could be considered as alternative
- EUTurbines considers that the text proposed, and graphs cannot be acceptable (not only by big generating units) in the way they are expressed, among other comments:
  - The graph proposed is not consistent with a real RoCoF behaviour nor with the ROCOF requirement proposed
  - The frequency in the graph shown in ENTSOE amendment proposal exceeds the generating unit permitted values in European standard; therefore, this is not technically acceptable

RoCoF containment as common target in CNCs

Requirement for Generators Regulation (2016/631), Recitals

(25) Synchronous power-generating modules have an inherent capability to resist or slow down frequency deviations, a characteristic which many RES technologies do not have. Therefore countermeasures should be adopted, to avoid a larger rate of change of frequency during high RES production. Synthetic inertia could facilitate further expansion of RES, which do not naturally contribute to inertia.

ROCOF containment as common target in CNCs

System Operation Guideline

Article 38

Dynamic stability monitoring and assessment

1. Each TSO shall monitor the dynamic stability of the transmission system by studies conducted offline in accordance with paragraph 6. Each TSO shall exchange the relevant data for monitoring the dynamic stability of the transmission system with the other TSOs of its synchronous area.

2. Each TSO shall perform a dynamic stability assessment at least once a year to identify the stability limits and possible stability problems in its transmission system. All TSOs of each synchronous area shall coordinate the dynamic stability assessments, which shall cover all or parts of the synchronous area.

3. When performing coordinated dynamic stability assessments, concerned TSOs shall determine:

a) The scope of the coordinated dynamic stability assessment, at least in terms of a common grid model;
b) The set of data to be exchanged between concerned TSOs in order to perform the coordinated dynamic stability assessment;
c) A list of commonly agreed scenarios concerning the coordinated dynamic stability assessment; and
d) A list of commonly agreed contingencies or disturbances whose impact shall be assessed through the coordinated dynamic stability assessment.

4. In case of stability problems due to poorly damped inter-area oscillations affecting several TSOs within a synchronous area, each TSO shall participate in a coordinated dynamic stability assessment at the synchronous area level as soon as practicable and provide the data necessary for that assessment. Such assessment shall be initiated and conducted by the concerned TSOs or by ENTSO for Electricity.

ROCOF containment as common target in CNCs

System Operation Guideline

Article 41
Structural and forecast data exchange

1. To coordinate the dynamic stability assessments pursuant to Article 38(2) and (4), and to carry them out, each TSO shall exchange with the other TSOs of the same synchronous area or of its relevant part of the following data:

a) Data concerning SGUs which are the power generating modules relating to, but not limited to:
   i. Electrical parameters of the alternator suitable for the dynamic stability assessment, **including total inertia**;
   ii. Protection models;
   iii. Alternator and prime mover;

…

ROCOF containment as common target in CNCs

System Operation Guideline

Article39

Dynamic stability management

1. Where the dynamic stability assessment indicates that there is a violation of stability limits, the TSOs in whose control area the violation has appeared shall design, prepare and activate remedial actions to keep the transmission system stable. Those remedial actions may involve SGUs.

2. Each TSO shall ensure that the fault clearing times for faults that may lead to wide area state transmission system instability are shorter than the critical fault clearing time calculated by the TSO in its dynamic stability assessment carried out in accordance with Article 38.

3. In relation to the requirements on minimum inertia which are relevant for frequency stability at the synchronous area level:

a) all TSOs of that synchronous area shall conduct, not later than 2 years after entry into force of this Regulation, a common study per synchronous area to identify whether the minimum required inertia needs to be established, taking into account the costs and benefits as well as potential alternatives. All TSOs shall notify their studies to their regulatory authorities. All TSOs shall conduct a periodic review and shall update those studies every 2 years;

b) where the studies referred to in point (a) demonstrate the need to define minimum required inertia, all TSOs from the concerned synchronous area shall jointly develop a methodology for the definition of minimum inertia required to maintain operational security and to prevent violation of stability limits. That methodology shall respect the principles of efficiency and proportionality, be developed within 6 months after the completion of the studies referred to in point (a) and shall be updated within 6 months after the studies are updated and become available; and

c) each TSO shall deploy in real-time operation the minimum inertia in its own control area, according to the methodology defined and the results obtained in accordance with paragraph (b)

ROCOF containment as common target in CNCs

System Operation Guideline

Article 139

Basic structure

1. All TSOs of each synchronous area shall specify the load-frequency-control structure for the synchronous area in the synchronous area operational agreement. Each TSO shall be responsible for implementing the load-frequency-control structure of its synchronous area and operating in accordance with it.

2. The load-frequency control structure of each synchronous area shall include:

a) a process activation structure in accordance with Article 140; and

b) a process responsibility structure in accordance with Article 141.

Article 141

Process responsibility structure

1. When specifying the process responsibility structure, all TSOs of each synchronous area shall take into account at least the following criteria:

a) the size and the **total inertia**, including synthetic inertia, of the synchronous area;

b) the grid structure and/or network topology; and

c) the load, generation and HVDC behaviour.

ROCOF containment as common target in CNCs

Emergency & Restoration Code Guideline

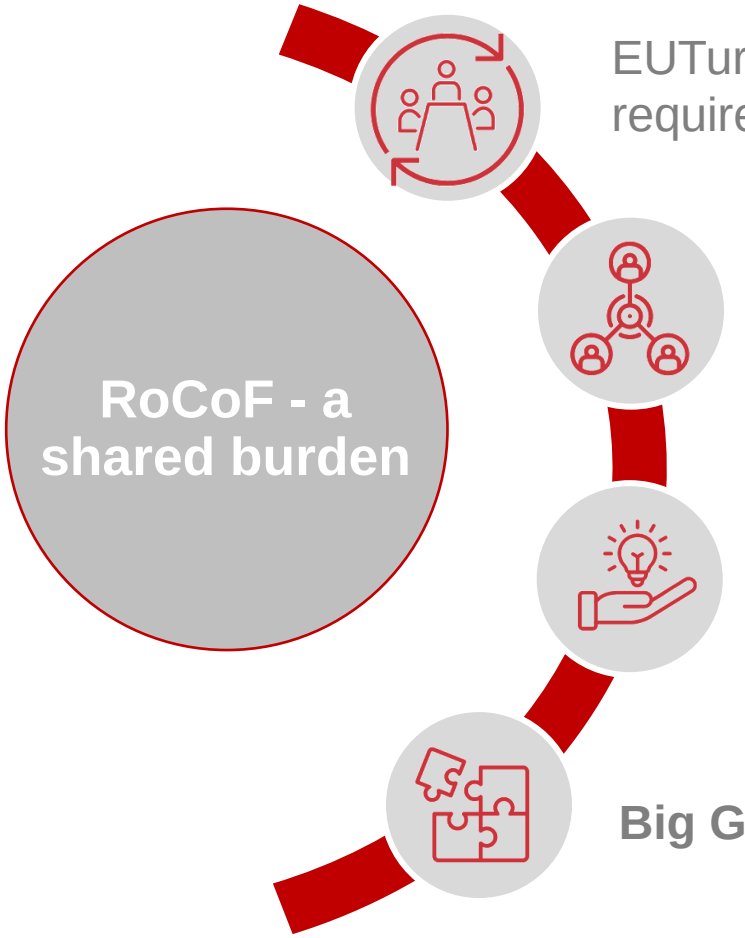
Article 15
Automatic under-frequency control scheme

…

7. When implementing the scheme for the automatic low frequency demand disconnection pursuant to the notification under Article 12(2), each TSO or DSO shall:

a) avoid setting an intentional time delay in addition to the operating time of the relays and circuit breakers;
b) minimise the disconnection of power generating modules, especially those **providing inertia**; and
c) limit the risk that the scheme leads to power flow deviations and voltage deviations outside operational security limits.

Conclusion



EUTurbines expects a continuous involvement on the topic with who is defining requirements and countermeasures

EUTurbines expects that the team working in defining requirements is in more close contact and is coordinating activities with the team dealing with system operation and inertia countermeasure

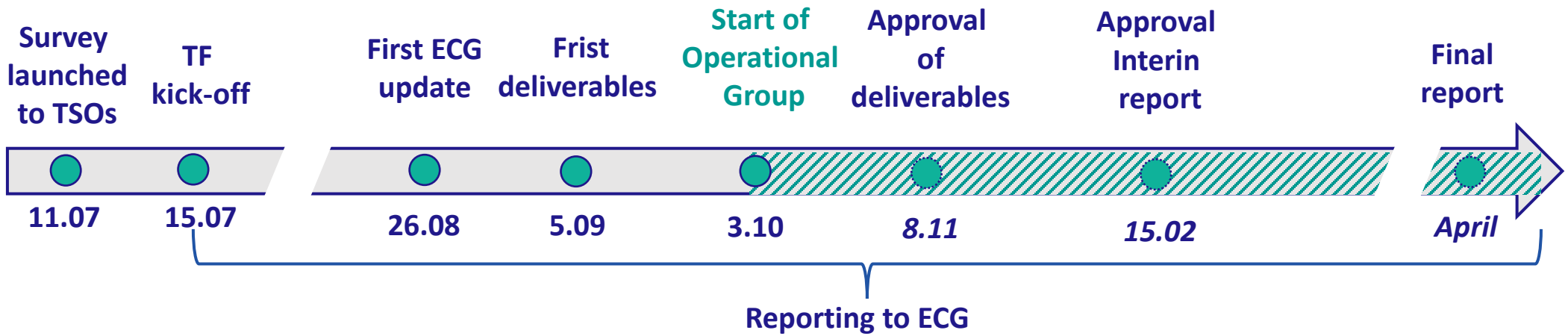
EUTurbines is available and willing to cooperate in initiatives and studies on these critical technical topics by providing technical inputs and expertise as needed

Big Generating units are key elements to the stability of the system

4. Update on Winter 22/23 preparation

ENTSO-E, Laurent Rosseel

Task Force's work - summary

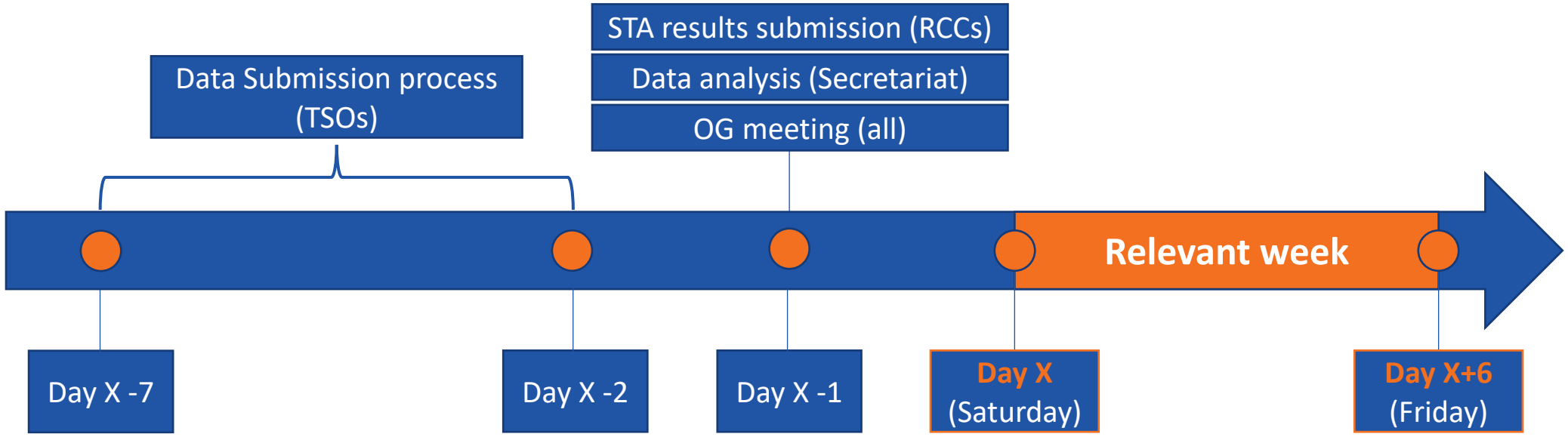


Task Force For Operational Coordination for Winter 2022 - 2023

1. SURVEY AND EVALUATION
2. MONITORING AND REVIEW OF THE SEASONAL OUTLOOK
3. COUNTER-MEASURES
4. ASSESSMENT OF EXISTING PROCEDURES AND TRAINING
5. COMMUNI-CATION
6. FEEDBACK ANALYSIS

Operational Group

- **All interconnected TSOs and all RCCs** participate in the group.
- All TSOs submit the data in **weekly cycle** (fuel supply, status of operating reserves, need for assistance, available DSR, unplanned outages impacting cross-border exchange, weather information, …).
- RCCs submit the results for **Short-Term Adequacy (STA) process**.
- The data is then analysed and used to prepare an overview of system's status for upcoming week.
- Operational Group meets weekly in order to align on the **forecast of system's situation.**



Synthesis of the results

EXAMPLE

Legend
No data available
System status

5. Report on CGM Implementation

ENTSO-E, Habir Paré

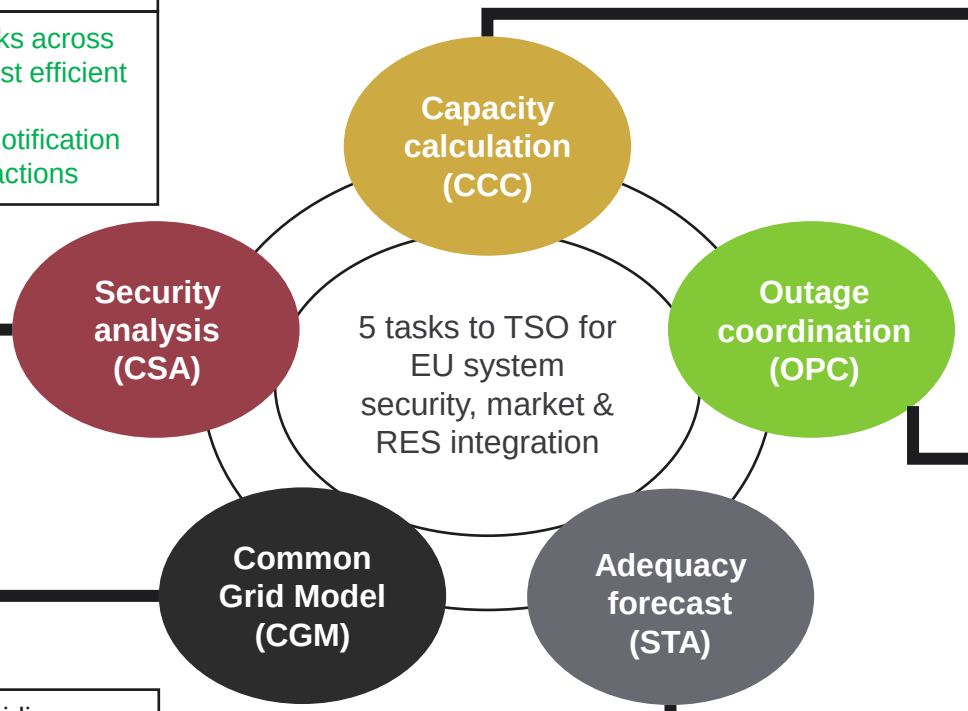
Why is regional coordination important?

Enabling reliable and efficient grid operations …

What: Identify risks to operational security in the vicinity of borders and identify efficient remedial actions as recommendations to affected TSOs

Benefits: Identification of operational security risks across all participating TSOs and identification of the most efficient remedial

- ***Risk identification***: operational security risk notification
- ***Efficiency***: identification of efficient remedial actions



What: calculation of available electricity transfer capacity across borders (either flow-based or net transfer capacity methodologies)

Benefits: Consideration of full grid =>

- ***Accuracy*:** more accurate calculation of available cross-border capacity
- ***Efficiency*:** more efficient utilisation of available capacity
- ***Responsiveness***: greater responsiveness to system conditions

What: single register of planned outages for grid assets and coordinated collaboration with respect to implications and options for outages

Benefits: Systematic and coordinated approach to outages, enabling:

- ***Efficiency***: optimised maintenance of outages across borders
- ***Transparency***: identification of issues caused by incompatible outages

What: Consistent pan-European grid model, providing an hourly view of grid assets (generation, consumption, transmission)

Benefits: single, consistent grid model across all affected TSO jurisdictions – a critical input to accurate outcomes from the other RCC tasks

- ***Consistency***: consistent, single, transparent grid models

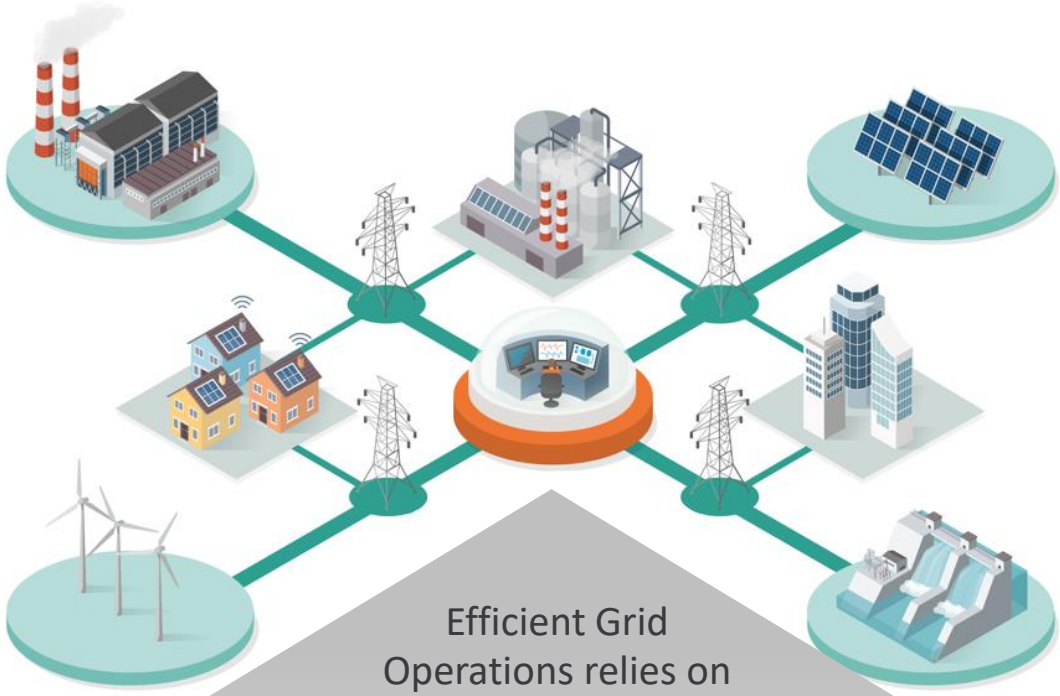
What: forecast adequacy and remedial actions

Benefits: pan-EU view of adequacy and available remedial actions:

- ***Early warning***: reducing risks of serious grid disruption
- ***Consistency***: single view of adequacy for TSOs, avoiding bilateral engagement with other TSOs

Importance of CGM & OPDE to facilitate these coordinated services

The **Common Grid Model (CGM)** and the **Operational Planning Data Environment (OPDE)** are fundamental enablers for reliable and efficient Grid Operations



Efficient Grid Operations relies on **Cross-Border Operational Planning**

Regional coordination processes

Coordinated Security Analysis	Coordinated Capacity Calculation	Outage Planning Coordination	Short and Medium Term Adequacy

ENABLED BY

Common/shared planning data

Common Grid Model (CGM)

SHARED AND ACCESSED THROUGH

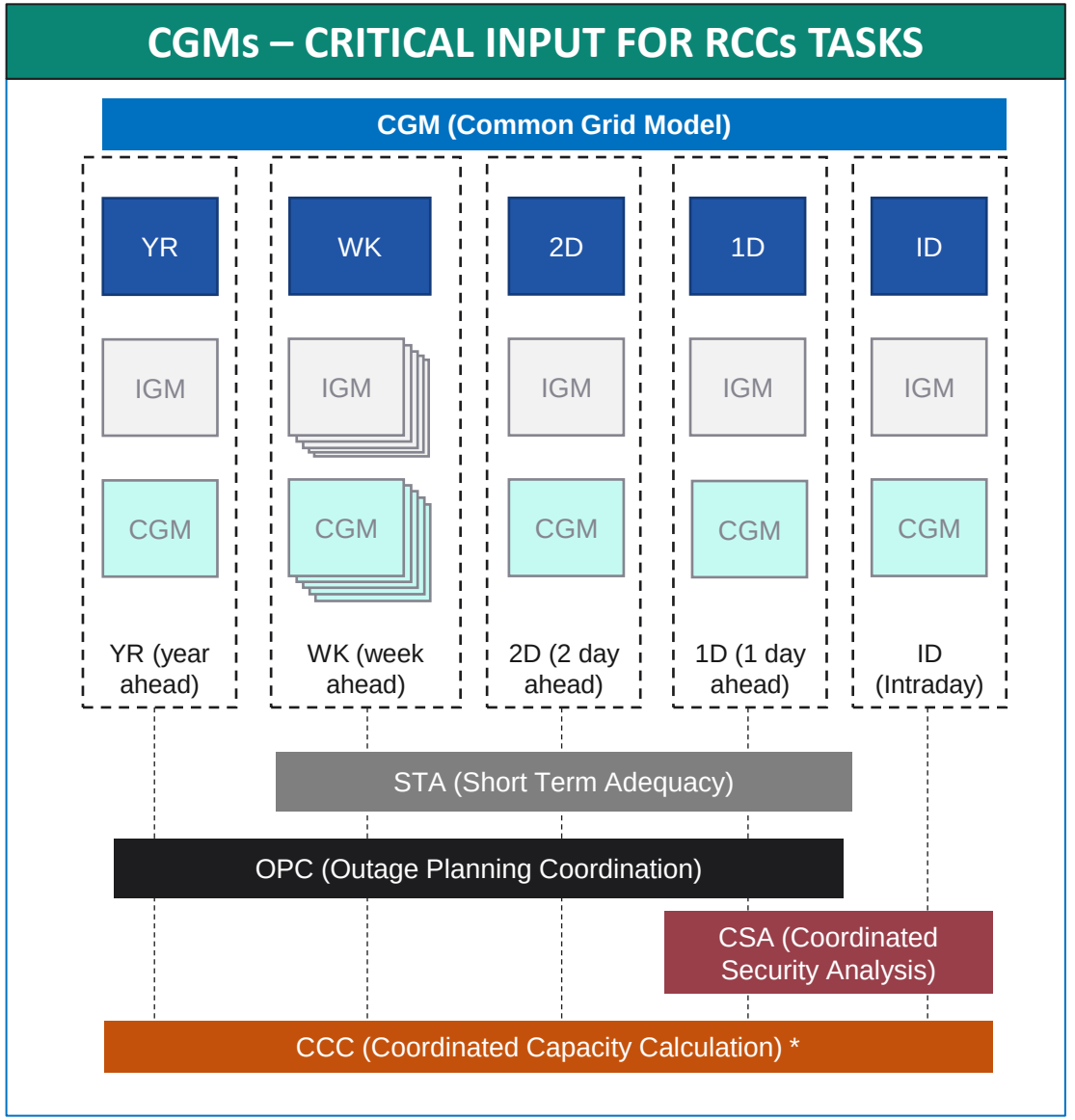
Digital infrastructure for pan-European data exchange & storage

Operational Planning Data Environment (OPDE)

CGMs are a critical input to other RCC tasks

- CGM is live, but the “minimum viable solution” delivered Dec 2021 is not yet sufficient for the RCC tasks that will use CGMs (in CGMES format)
- Each service is dependent on a different subset of timeframes
- As a result, it will be important to match delivery timescales for RCC tasks using CGMs with priorities for improving completeness and quality

- **Roadmap for exploitation of CGM in regional and cross-regional processes is a complex interconnected set of delivery programmes, requiring an ongoing focus from the TSO/RCC/CCR community**
- **Coordinated planning activity for RCC tasks has been initiated and it will identify dependencies and reduce uncertainties.**



* Some regional methodologies may not require CGMs (e.g. using historical models)

Meeting model quality requirements

What are we doing to support full participation?

Execute central interoperability testing
extract quality metrics and report on how the TSOs can enhance the quality of their IGMs

Improve error reporting
Improvements to error and warning messages, to aid understanding and troubleshooting

Stabilise CGMES standard
Stabilization of the current CGMES version, enabling greater focus on improving model quality

Regular operational review
Weekly operational calls with TSOs and RCCs and reporting to identify issues and areas of investigation early

Regular issue debugging
Analysis of issues raised in the tickets in OPDE support and targeted ENTSO-E Secretariat support

Develop offline validation tool
Provision of tool (aligned with OPDE) which enables TSOs to test updates to their models and understand the impact of proposed new rules

Share modelling experience
TSOs and RCC modelling group has been established to share experience, provide support and collectively drive up overall quality

Conduct validation sensitivity analysis
Temporary reduction in validation stringency to achieve incremental quality improvements

Next steps / focus areas for 2023

FOCUS AREA	*ACTIONS*	*MILESTONES*
OPDE DELIVERY & USAGE	• **Achieve full OPDE access** for all stakeholders	**Q2 2024**
	• **Await regulatory resolution to allow TSO with legal issues to participate**	**[Asap]**
	• Deliver new OPDE functionalities which will simplify installation, configuration and operation for **all TSOs/RCCs**	**OPDE Releases: Q2 2023, Q4 2023**
	• Identify improvements to vendor support arrangements	**Q2 2023**
GRID MODELLING	• Decision on stabilization of the current version of CGMES standard (enabling focus on existing CGM service)	**Q1 2023**
	• **Continuous review/improvement** of effectiveness of all-TSO-RCC modelling group and interoperability, to maximise increases in overall performance	**Q1-Q4 2023**
	• Sensitivity analysis leading to **reduction of validation stringency testing**	**Q1-Q2 2023**
USE OF CGM IN OPERATIONAL PROCESSES	• Developing roadmap of use of CGM in CGMES format in RCCs tasks	**Ongoing**

Questions?

6. Update on Tmin FCR LER

ENTSO-E, Luca Ortolano

CBA LER
TSOs' Proposal for a working plan in response to NRAs' requests

Proposal of tasks to fulfil NRAs' requests – TSOs' considerations

NRAs main requests can be summarized as following. Request number:

- **1. Perform FCR Probabilistic Dimensioning**
- **2, 3 – Assess of the effectiveness of FRR/RR dimensioning and performances**
- **6, 7 – List implemented/planned LLEFD and DFD mitigation actions**
- **9, 10 - New survey to update FCR costs (LER and non-LER), run a new instance of the CBA**
- **11, 12, 13, 14 – Assess performances mFRR/RR products for tertiary reserves needs and compare resulting performances**
- **5 - Assess possible improvements in forecast quality**
- **4, 8 – Simulate Δf, LLEFD considering all studied improvements**

Proposal of tasks to fulfil NRAs' requests – TSOs' proposal

The TSOs consider that the **most effective** way to fulfill the NRAs' request is to adopt a **forward-looking approach**.

With such approach, the activities will be focused on the projects the TSOs are implementing to improve the real-time coordination for the cross-block reserve activation in response to LLEFDs.

The proposal is thus to fulfill NRAs request as follows:

Requests 2, 3, 6, 7, 11, 12, 13, 14: by **focusing on all the ongoing projects that TSOs are implementing** to improve the real-time coordination between blocks and cross-block reserve activation, e.g.:

- **new activation platform** (such as PICASSO and MARI).
- refinement on the Emergency Procedure, **e.g., with a close to real-time share of the available reserves** between blocks.

Requests 5: TSOs remark how out of the 20 most challenging LLEFDs (2017-2021), only in 3 an error in load/RES forecasts was one – not central - contributing factor.

Nevertheless, **TSOs are aware of the importance of accurate Load/RES forecasts** and are thus already striving to exploit cutting-edge forecasts technologies.

Requests 4, 8: TSOs highlight that it is not feasible to generate future frequency deviation trends to assess to what extent the mitigation measures/operational improvements will be effective in the future.

The proposal is therefore to **exploit the historical frequency trends** (updated at the most recent available data) to **assess the potential impact** that such mitigation measures and **operational improvements would have had if they were implemented in the past**.

Proposal of tasks to fulfil NRAs' requests – TSOs' proposal

Request 1 : TSOs confirm that the activity is ongoing. The schedule is to try to finalize the **methodology by the end of 2023**.

Requests 9, 10: **TSOs acknowledge the forward-looking** approach proposed by the NRAs, but they how the **approved methodology** to perform the CBA (Art.156(11) SO GL) explicitly foresees an approach based on **historical information rather than on forecasts** on how the system will look like in the future.

Nonetheless - acknowledging NRAs' requests – **TSOs will perform the re-run of the CBA methodology** considering the following **update in the input**:

- Historical frequency data (most recent available dataset) where the LLEFD and DfDs are modified in order to take into account the **effects that all the mitigation measures/operational improvements** (outcomes of points 2, 3, 6, 7, 11, 12, 13, 14) would have had if retroactively applied.
- **FCR updated costs** for both LER and non-LER.

7. Cybersecurity Network Code – Status Update

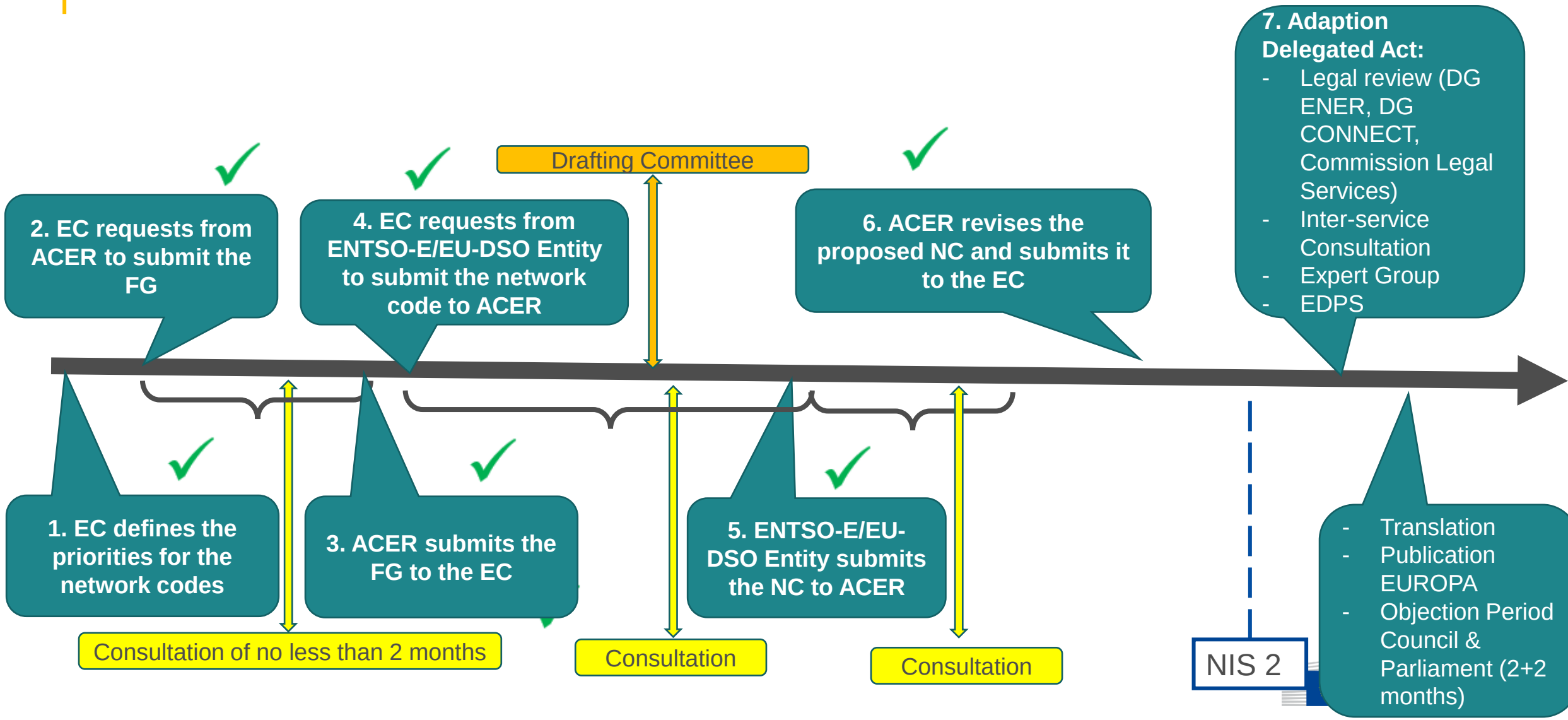
System Operation European Stakeholder Committee

Cybersecurity: Status update on Cybersecurity Network Code

DG ENER, Felipe Castro Barrigon

15 March 2023

NCCS: process



What will be in the NCCS?

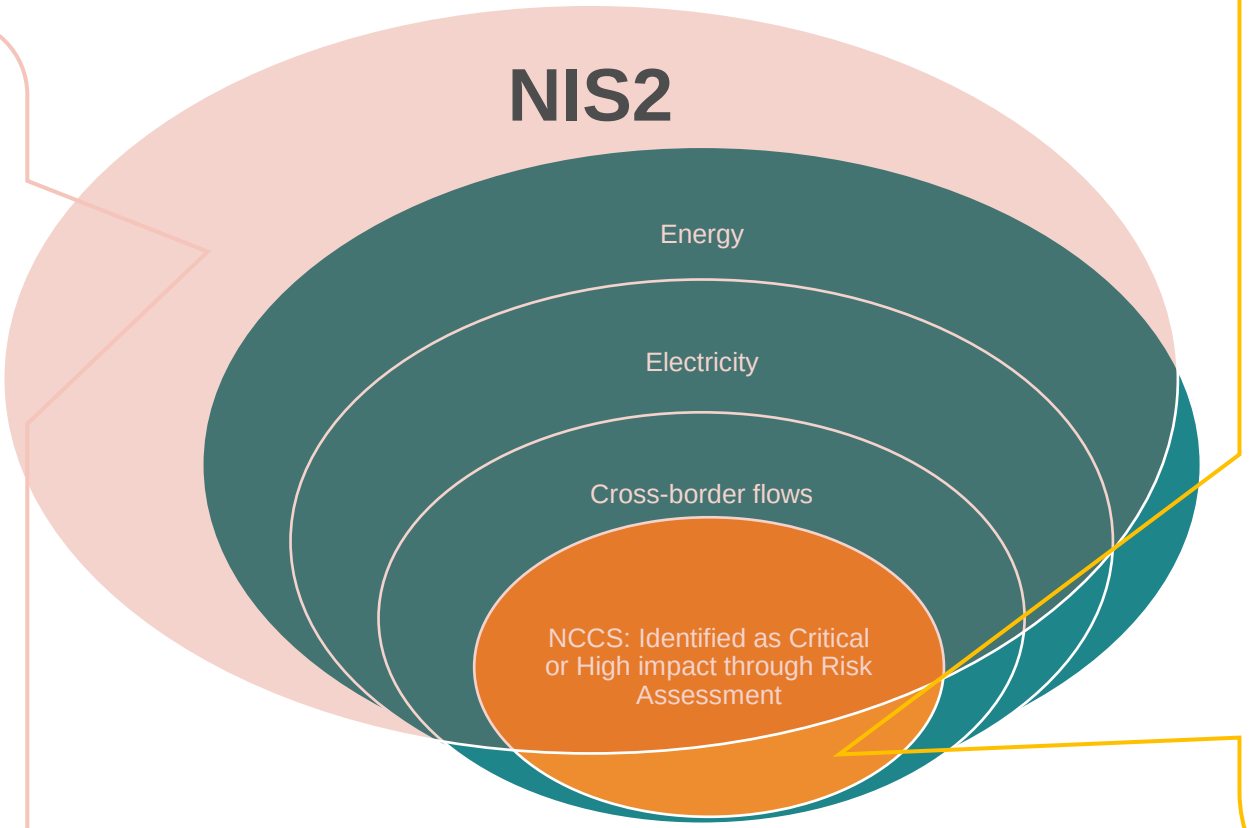
European Commission

NCCS: Scope of applicability

NIS2 Annex I:

- Electricity undertakings referred to in point (57) of Article 2 of Directive (EU) 2019/944 carry out the function of 'supply'
- Distribution system operators
- Transmission system operators
- Producers
- Nominated electricity market operators
- Electricity market participants providing aggregation, demand response or energy storage services

- **Operators of a recharging point(new)**



Additionally to current NIS2 proposal, the NCCS covers the following entities (*):

- **Organised market place**
- NEMOs (nominated el. Market operators.
- ENTSO for Electricity, EU DSO entity
- European Union Agency for the Cooperation of Energy Regulators (ACER)
- National regulatory authorities (NRAs)
- **NCCS – National Competent Authority**
- National competent authorities for risk preparedness (RP-NCA)
- **RCCs**
- Critical service providers
- Managed security service provider (MSSP)
- National competent authorities on the security of network and information systems (CS-NCA)
- Computer security incident response teams (CSIRTs)
- The European Union Agency for Cybersecurity or (ENISA)
- **Any entity or third party to whom responsibilities have been delegated or assigned** (*) insofar as as their activities concern cybersecurity aspects of cross-border electricity flows

NCCS: Content

- a comprehensive cross-border cybersecurity risk management process;
- clear roles and responsibilities;
- minimum and advanced cybersecurity controls (mapped against selected European and international standards);
- cybersecurity information sharing flows to ensure timely information and foster quick and coordinated reaction of relevant stakeholders;
- rules on incident handling and crisis management;
- a cybersecurity exercise framework to enhance preparedness of all operators;
- rules for the protection of information exchange;
- a framework for monitoring, benchmarking and reporting

Structure of the Network Code (Ongoing review)

TITLE I GENERAL PROVISIONS
TITLE II RISK ASESSEMENT AND MANAGEMENT AT UNION, REGIONAL, NATIONAL AND ENTITY LEVEL
TITLE III IDENTIFICATION OF THE RELEVANT CYBERSECURITY RISKS

TITLE IV COMMON ELECTRICITY CYBERSECURITY FRAMEWORK
TITLE VI INFORMATION FLOWS, CYBERSECURITY INCIDENT AND CRISIS MANAGEMENT
TITLE VII ELECTRICITY CYBERSECURITY EXERCISE FRAMEWORK

TITLE V CYBERSECURITY PROCUREMENT RECOMMENDATIONS
TITLE VIII PROTECTION OF INFORMATION
TITLE IX FINAL PROVISIONS

NCCS: current changes from ACER to COM - ongoing review

- New structure of articles
- Legal rewording, ensuring scope in each article. Alignment with other NCs.
  - For example, naming convention for the Competent Authority
  - Role of TSOs and ENTSO-E in development and adoption of TCMs
- Further alignment with NIS2, published on 27.12.2022.
  - E.g. references to articles, roles of ENISA & CSIRTs network, reporting obligations, disclosure of vulnerabilities, requirements on ICT providers, crisis management workflow, etc
- Risk Monitoring Body and Risk Working Group, cooperation mechanisms
- Grouping of articles related to controls in Title IV (including Common electricity framework)

NCCS: current changes from ACER to COM (cont') - ongoing review

- Grouping of articles related to Risk Assessment in Title III
- Transitional period. Timing reviewed
- Inclusion of clauses relatives to data protection

Thank you

European Commission

8. AOB