ACER

European Union Agency for the Cooperation of Energy Regulators

ACER Public Workshop

on the potential amendments
to the European Grid Connection Network Codes

25 May 2022

ACER
European Union Agency for the Cooperation of Energy Regulators

Workshop's agenda

Time	Agenda Item
10.00 – 10.05	**Introductory Remarks**
10.05 – 10.30	ACER/CEER Policy Paper
10.30 – 11.15	Q&A (oral questions/comments)
11.15 – 11.20	**Short break**
11.20 – 11.50	Q&A (online submissions via chatbox)
11.50 – 11.55	**Summary and next steps**
11.55 – 12.00	**Closing Remarks**

ACER
European Union Agency for the Cooperation of Energy Regulators

Introductory remarks

Marco Pasquadibisceglie, ACER/CEER Electricity WGs, ARERA

ACER
European Union Agency for the Cooperation of Energy Regulators

ACER/CEER Policy Paper

Uros Gabrijel, ACER

Legal basis for the amendments:

- **Article 60** of Regulation (EU) 2019/943 – amendments of network codes

Article 60

Amendments of network codes

1. The Commission is empowered to amend the network codes within the areas listed in Article 59(1) and (2) in accordance with the relevant procedure set out in that Article. ACER may also propose amendments to the networks codes in accordance with paragraphs 2 and 3 of this Article.

2. Persons who are likely to have an interest in any network code adopted under Article 59, including the ENTSO for Electricity, the EU DSO entity, regulatory authorities, transmission system operators, distribution system operators, system users and consumers, may propose draft amendments to that network code to ACER. ACER may also propose amendments on its own initiative.

3. ACER may make reasoned proposals to the Commission for amendments, explaining how such proposals are consistent with the objectives of the network codes set out in Article 59(3) of this Regulation. Where it considers an amendment proposal to be admissible and where it proposes amendments on its own initiative, ACER shall consult all stakeholders in accordance with Article 14 of Regulation (EU) 2019/942.

Policy Paper

Scope of the Policy Paper:

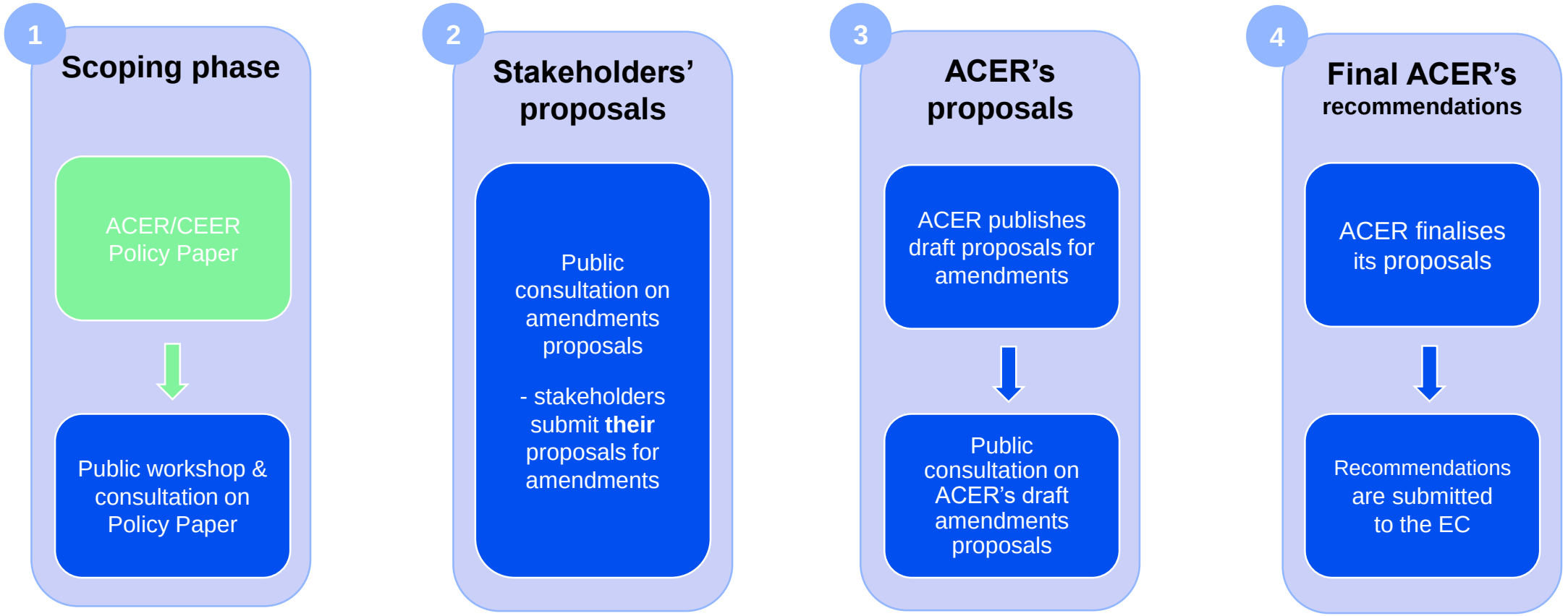
- **NC RfG** – Network Code on Requirements for Generators — Regulation (EU) 2016/631
- **NC DC** – Network Code on Demand Connection — Regulation (EU) 2016/1388

Out of the Policy Paper scope:

- **NC HVDC** – Network Code on Requirements for HVDC — Regulation (EU) 2016/1447
  - Before initiation, amendment process for the NC HVDC should be informed by the 2nd report of the relevant Expert Group of the Grid Connection European Stakeholder Committee
  - Separate amendment process (similar to the ongoing one) will start at the later stage

Policy Paper in the amendment process

- Policy Paper as the first phase of the process towards the amendment of the RfG and DC NCs



ACER
European Union Agency for the Cooperation of Energy Regulators

Method and structure of the Policy Paper

NC RfG – Network Code on Requirements for Generators
Regulation (EU) 2016/631

NC DC – Network Code on Demand Connection
Regulation (EU) 2016/1388

1. Executive summary

2. Introduction

3. Objectives

4. Problem definition

- What are the current problems and challenges related to the NC RfG and NC DC?

5. Options to address the problems

- What options exist to address the problems?

6. Analysis and recommendations

- Which policy option has been chosen as the most appropriate and why? What is recommended?

7. Conclusions and proposed actions

- What actions are proposed to implement the policy recommendations?

ACER
European Union Agency for the Cooperation of Energy Regulators

European Stakeholder Committees

ACER and ENTSO-E co-organise three European Stakeholder Committees (ESCs), one per family of codes (Market codes, Operational codes and Connection codes)

- **Main objectives**
  - To contribute to monitoring progress in the NCs implementation process
  - To serve as a platform to share general views on the NC implementation, with a particular focus to enable stakeholders to express their views and receive feedback, including discussion on proposals for amendments to the NCs
  - To contribute to a more informed decision-making process for the methodologies and rules to be developed for the implementation of the NCs
- ESCs webpage: https://www.entsoe.eu/network_codes/esc/#esc
- Expert Groups under the Grid Connection ESC assessed several areas for the improvements of the grid connection network codes

ACER
European Union Agency for the Cooperation of Energy Regulators

European Stakeholder Committees

- **Expert Groups** - expert groups' reports

EG PSH
Requirements for pump-storage hydro power generation modules.

- Final Report PSH (+supporting material) - phase 1&2 results
- Annex
- EG PSH Reporting 16th GC ESC
- EG PSH Reporting 14th GC ESC
- EG PSH Reporting 13th GC ESC
- EG PSH Reporting 12th GC ESC

EG STORAGE
Identification of storage devices.

- Final Report (+ supporting material) - phase 2
- Final Report (+ supporting material) - phase 1
- Annex
- EG STORAGE Reporting 16th GC ESC
- EG STORAGE Reporting 14th GC ESC
- EG STORAGE Reporting 13th GC ESC
- EG STORAGE Reporting 12th GC ESC

EG MCS
Mixed customer sites with generation, demand and storage, and definition of system users.

- Final Report - phase 2
- Final Report - phase 1
- Annex
- EG MSC Reporting 18th GC ESC
- EG MSC Reporting 16th GC ESC
- EG MSC Reporting 14th GC ESC
- EG MSC Reporting 13th GC ESC
- EG MSC Reporting 12th GC ESC

EG CROS
Connection Requirements for Offshore Systems

- Final Report - Phase 1
- Annex
- EG CROS Reporting 25th GC ESC

EG ACPPM
Advanced Capabilities for Grids with High Shares of Power Park Modules

- Annex

EG HCF
Harmonization of Certification and product Family grouping

- Annex
- EG HCF Reporting 25th GC ESC

EG BftA
Baseline for type A power-generating modules

- Final Report
- Annex
- EG BftA Reporting 23rd GC ESC
- EG BftA Reporting 22nd GC ESC
- EG BftA Reporting 21st GC ESC
- EG BftA Reporting 20th GC ESC
- EG BftA Reporting 19th GC ESC

EG CSM
Criteria for significant modernisation

- Final Report
- Annex
- EG CSM Reporting 23rd GC ESC
- EG CSM Reporting 22nd GC ESC
- EG CSM Reporting 21st GC ESC
- EG CSM Reporting 20th GC ESC
- EG CSM Reporting 19th GC ESC

EG ISSM
Interaction Studies and Simulation Models for PGM/HVDC

- Final Report
- Annex
- EG ISSM Reporting 23rd GC ESC
- EG ISSM Reporting 22nd GC ESC
- EG ISSM Reporting 21st GC ESC
- EG ISSM Reporting 20th GC ESC
- EG ISSM Reporting 19th GC ESC

ACER
European Union Agency for the Cooperation of Energy Regulators

Key areas

- Key identified areas for the forthcoming amendments to the RfG and DC NCs as outlined in the **Policy Paper**


Requirements for PSH PGMs

Determination of Significance

Significant Modernisation

Requirements for Storage


Rules on Electromobility

Mixed Customer Sites

Requirements for Type A PGMs

Interaction Studies & Simulation Models

Capabilities for Grid with DER

Weather Hazards Requirements


Active Customers & Energy Communities


Requirements for Units Providing DRS

ACER
European Union Agency for the Cooperation of Energy Regulators

Requirements for pump-storage hydro PGMs

- **Problem definition**
  - Technical capabilities of pump-storage hydro PGMs vary by type of unit and operation mode
  - At present, pump-storage hydro PGMs shall, in principle, fulfil all the relevant requirements in both injecting and withdrawing modes

- **Policy recommendations**
  - Applicable rules should be defined in a more detailed manner to address the innate capabilities and constraints of the units
  - Each type of pump-storage hydro PGMs should meet all the feasible technical requirements per operation mode

ACER
European Union Agency for the Cooperation of Energy Regulators

Determination of significance of PGMs

PGMs

- **Problem definition**
  - PGMs are categorised as type A, B, C or D depending on both the installed capacity and the voltage level (Article 5 of NC RfG)
  - Cumulative character of the capacity and voltage criteria in their present form may lead to disproportionate technical requirements for PGMs (in particular for small-sized PGMs)

- **Policy recommendations**
  - Address identified disproportions between technical requirements and actual PGMs' effect on the overall system, particularly for small-sized PGMs
  - Any changes to the classification of PGMs should not result in evading rules that contribute to stable operation of the interconnected system

ACER
European Union Agency for the Cooperation of Energy Regulators

Technical requirements for mixed customer sites with generation, demand and storage

MCS

- **Problem definition**
  - Currently, the provisions of the NC RfG and NC DC do not sufficiently reflect the particularities of MCSs (e.g., a combination of generation, demand and/or storage units, small PGMs, RES)
  - Need for an enduring solution to this issue - possible derogations to remedy such situations are time-limited.

- **Policy recommendations**
  - A possible amendment of the NC RfG shall:

    - consider voltage level at connection point to MSC; and/or

    - possibly apply voltage criteria only above specific maximum capacity threshold,

    while taking into account the relevant features of the MSC and ensure a proper balance between the system needs and the connection requirements

CDS – closed distribution system

ACER
European Union Agency for the Cooperation of Energy Regulators

Requirements for type A PGMs

type A

- **Problem definition**
  - The EU Member States set different thresholds for type A classification, and hence, manufacturers active in the several EU Member States are forced to include various type B capabilities for small-size units
  - In view of this wide range, the question arises as to whether some requirements for type B PGMs should also apply to type A

- **Policy recommendations**
  - Harmonisation of thresholds between type A and type B PGMs
  - Determine which requirements that apply to type B PGMs may also be necessary for type A PGMs in terms of system security (e.g., Fault Ride Through)

ACER
European Union Agency for the Cooperation of Energy Regulators

Significant modernisation

- **Problem definition**
  - The NC RfG and NC DC do not apply to the «existing» units unless they have been modified to such an extent that their connection agreement must be substantially revised
  - However, the GC NCs are not prescriptive as to the criteria to identify significant modernisation

- **Policy recommendations**
  - Clarify when the modification would result in the application of the requirements of the relevant GC NCs (partial of full)
  - List ranges of modification of the relevant technical characteristics which could be considered as significant modernisations and the minimum requirements of the GC NCs which should apply in these cases
  - Exact modification criteria and the requirements of the GC NCs applying in the case of significant modernisation will have to be defined at national level

ACER
European Union Agency for the Cooperation of Energy Regulators

Technical requirements for storage

- **Problem definition**
  - In their current version, grid connection network codes do not elaborate on specific requirements for storage units that are set to grow in number in the coming years
  - Storage technologies have specific characteristics and inherent constraints that might differentiate them from other units

- **Policy recommendations**
  - The inclusion of technical requirements for storage units would be a transparent and robust solution that would lead to a more secure system operation and their better integration
  - Specific characteristics and constraints of particular storage units should be duly considered while recognizing a need for legal certainty and system security

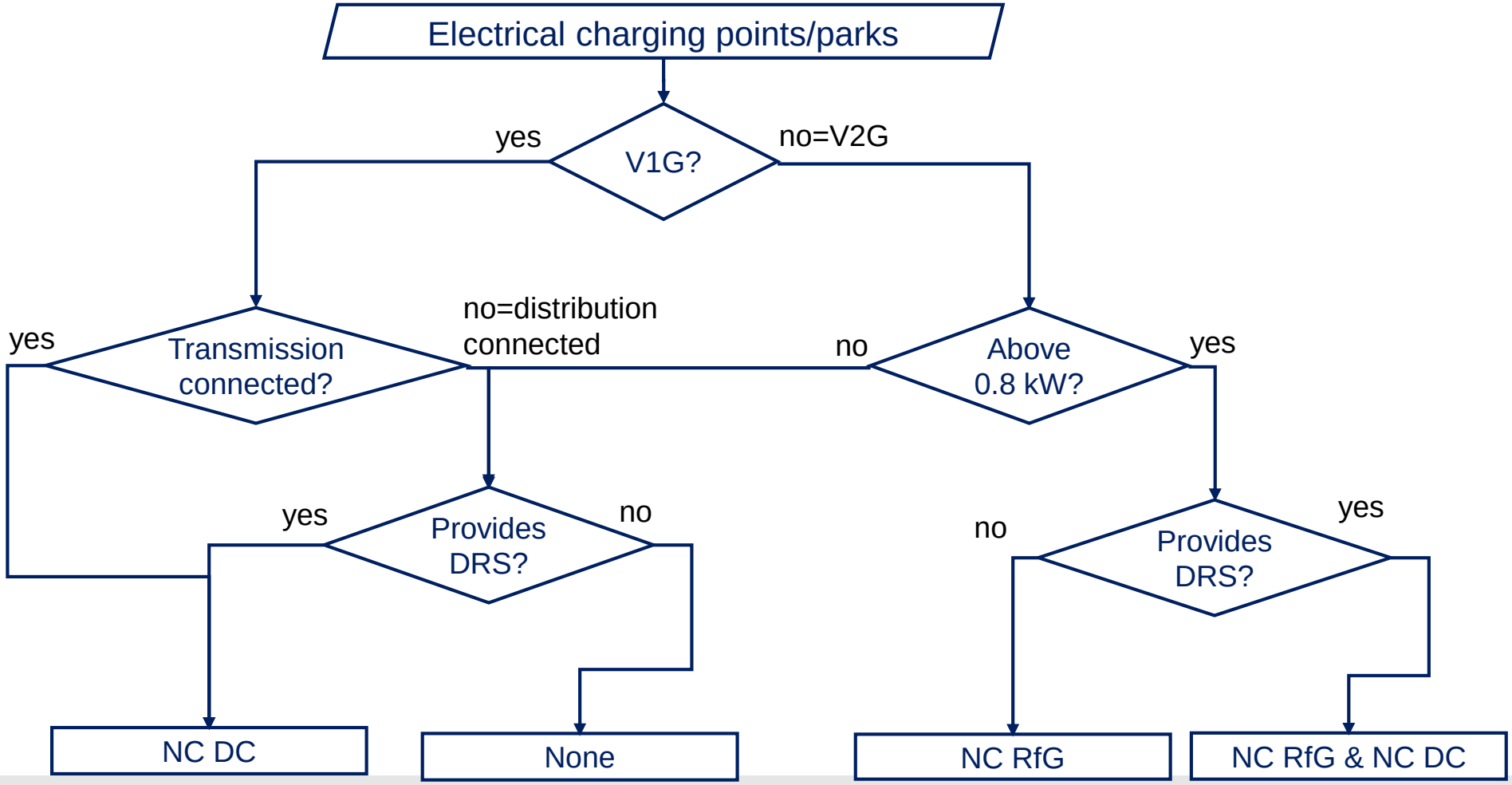
Electromobility

- **Problem definition**
  - Expanding electromobilty necessitates an appropriate consideration of the needed technical connection requirements (primarily of the electrical charging points), operational notification procedures and compliance regimes
  - Electrical charging points (ECPs)/Electric Vehicles are either able to operate in both injection and withdrawal operational mode (V2G) or act as demand units only (V1G)

- **Policy recommendations**
  - Applicable technical requirements should take into account ECPs' specificities and their intended use (e.g., charging and/or discharging operations, presence of stationary batteries, capacity asymmetry - withdrawal vs injection, demand side response etc.)
  - Introduction of the distinct capacity threshold for electrical charging points (similar to a threshold between type A and B PGMs) seems the most efficient policy option that fosters the harmonisation

EVs – electric vehicles

Simplified logic diagram of applicability of Grid Connection (GC) NCs



ACER
European Union Agency for the Cooperation of Energy Regulators

Simulation models and compliance monitoring

ISSM

- **Problem definition**
  - Facility owners or DSOs demonstrate compliance with relevant GC NCs with the help of validated simulation models
  - Use of models brings about the issues of their confidentiality and accuracy; moreover, efficiency and certainty concerning the validation process could be improved

- **Policy recommendations**
  - Relevant requirements laid down in GC NCs could be refined to provide more certainty on admissible methods, formats and encryption, and the introduction of contractual arrangements should be considered
  - Rules on simulation models and compliance monitoring should ensure the balance between the protection of legitimate interests, robustness, information security and national particularities

ACER
European Union Agency for the Cooperation of Energy Regulators

Advanced capabilities for grids with high penetration of DER

DER

- **Problem definition**
  - Medium and low voltage distribution networks have been dimensioned for limited generation connected to this infrastructure
  - Increasing development of dispersed generation, mainly driven by the installation of small-scale RES PGM and storage, changes flow patterns in distribution networks

- **Policy recommendations**
  - Moving towards a smart approach would improve overall system controllability and hence, its security
  - Dimensioning should be adequate, efficient and include cooperation between TSOs and DSOs to accommodate system users' needs and reduce capital costs

DER – distributed energy resources

ACER
European Union Agency for the Cooperation of Energy Regulators

Requirements for weather hazards resilience of generators

- **Problem definition**
  - Uninterrupted operation of generators is vital to ensure that the system can safely accommodate reasonable demand
  - Nevertheless, safe generation may be hampered by emerging or increased environmental risks, including changing weather patterns that could result in weather hazards

- **Policy recommendations**
  - The introduction of requirements for resilience to weather hazards is foreseen to emphasise the need to address this emerging risk and will allow TSOs to take adequate measures
  - In defining specific requirements, TSOs should consider historical records or studies concerning performance temperature limits, respecting the proportionality principle

ACER
European Union Agency for the Cooperation of Energy Regulators

Technical requirements for active customers/ energy communities

- **Problem definition**
  - Development of RES and dispersed generation facilitated the appearance of new roles in the system, namely, active customers (so-called prosumers) and energy communities
  - Connection rules outlined in GC NCs do not capture these emerging roles fully

- **Policy recommendations**
  - From the perspective of the network, active customers should be considered similar to the mixed customer sites
  - Relevant technical requirements should apply to energy communities at the connection point with the public network; no derogations are foreseen

ACER
European Union Agency for the Cooperation of Energy Regulators

Requirements for units providing demand response services

- **Problem definition**
  - Currently, units providing demand response services to the system operator shall meet technical requirements laid down in Articles 28-30 of NC DC, should this network code apply to them
  - The issue of demand response is to be covered by the forthcoming Framework Guidelines adopted by ACER, and hence, the current regulatory approach can be subject to revision

- **Policy recommendations**
  - Necessary revision should be consistent with the Framework Guidelines and provide stakeholders with the appropriate time to implement the changes
  - Better integration of concerned users to the system may be facilitated by the inclusion of relevant requirements in the System Operation Guideline

SO GL – System Operation Guidelines
Regulation (EU) 2017/1485

ACER
European Union Agency for the Cooperation of Energy Regulators

Q&A session

(oral questions/comments)

ACER
European Union Agency for the Cooperation of Energy Regulators

Short break

Workshop will reconvene soon

ACER
European Union Agency for the Cooperation of Energy Regulators

Q&A session

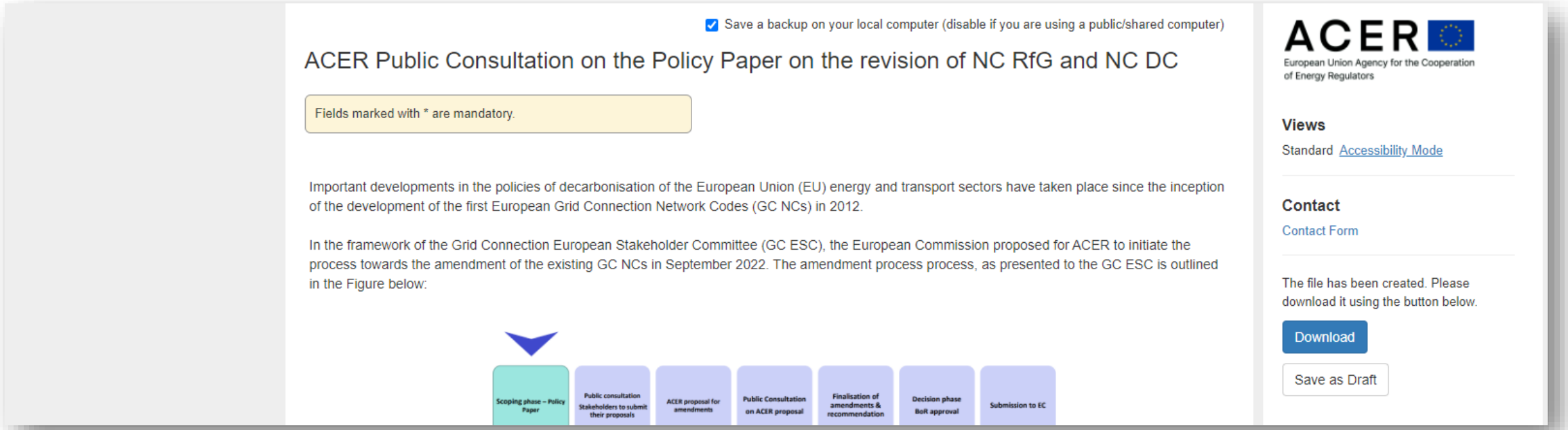
(online submissions via chatbox)

ACER
European Union Agency for the Cooperation of Energy Regulators

Summary and next steps

Uros Gabrijel, ACER

Public consultation on the Policy Paper



Enter the public consultation on the Policy Paper

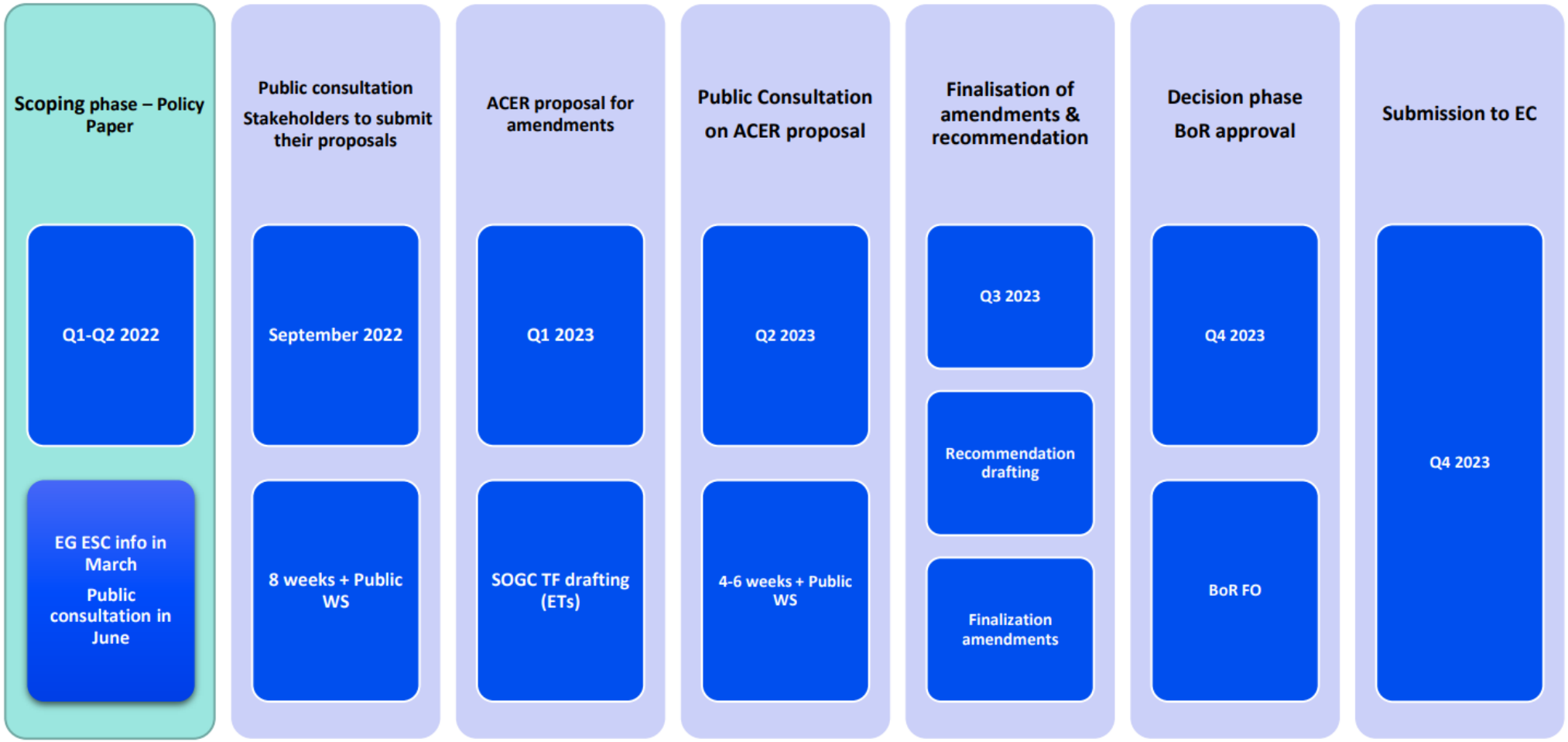
ACER
European Union Agency for the Cooperation of Energy Regulators

Towards a review of connection codes

Planning of the Policy Paper

ACER
European Union Agency for the Cooperation of Energy Regulators

Towards a review of connection codes



ACER
European Union Agency for the Cooperation of Energy Regulators

Closing Remarks

Elaine O’CONNELL, European Commission

Thank you.
Any questions?

The contents of this document do not necessarily reflect the position or opinion of the Agency.

ACER
European Union Agency for the Cooperation of Energy Regulators

info@acer.europa.eu
acer.europa.eu
@eu_acer
linkedin.com/company/EU-ACER/