



All-island Network Code Stakeholder Forum

21 February 2019

Dublin



Agenda

- **10h00** Reception and coffee
- **10h30** Network Codes update
- **10h50** ENTSO-E activity and the Common Grid Model
- **11h05** Update from DSO/DNO
- **11h20** Focus on the electricity balancing Guideline
- **11h45** Focus on the Key Organisational Requirements, Roles and Responsibilities (KORRR)
- **12h15** Q&A & Lunch

Practical info

- Fire alarm & exits
- Room temperature
- Slides will be available online
- Q&As & feedback



Regulatory update on EU Network Codes and Guidelines

Why should you be interested?

- **Changes to connection standards** – Generator Connections, Demand connections, HVDC connections (Interconnectors/Offshore etc)
- **Changes to System Operations, Data Exchange requirements, Grid codes, Black start services, Emergency procedures** - System Operation, Emergency Restoration
- **Changes to Market Operations, Harmonised EU Platforms, Interconnector Flows** - Electricity Balancing, CACM, FCA

EU Network Codes and Guidelines

Connections

Requirements for
Generators (RfG)

Demand Connection (DCC)

High Voltage DC (HVDC)

Operational

System Operation (SOGL)

Emergency Restoration
(ER)

Markets

CACM- Capacity and
Congestion Management

Forwards and Liquidity
(FCA)

Balancing (EBGL)

Visibility of work underway



Stakeholder Fora – number per year- info published on SONI/EirGrid [website](#)



Consultations and Decision papers- located on TSO/DSO/ RA /EU websites



Stakeholders welcome to contact Network Operators and Regulators on specific issues

Visibility of work underway

TSOs

SONI [website](#)

EirGrid [website](#)

DSOs

ESBN [website](#)

NIE
[website](#)

Regulatory Authorities

CRU
[website](#)

UR
[website](#)

All-EU Bodies

ENTSO-E [website](#)

CEER [website](#)

ACER [website](#)

EUNC updates

Requirements for Generators

- Emerging Technology – Decision and monitoring
- Criteria to be used if seeking a derogation published
- RfG technical parameter consultation and decisions published
- Operational Notification processes underway
- Integration of new technical standards into Grid Codes and D Codes in process

Demand Connection Code

- Criteria to be used if seeking a derogation published
- DCC technical parameters consulted – RA decision by mid March 2019
- Operational notification processes to be established
- Translation of technical standards to be progressed

EUNC updates

HVDC

- Criteria to be used if seeking a derogation **published**
- HVDC technical parameter consulted – RA decision to follow
- Operational Notification processes underway
- Integration of new technical standards into Grid Codes and D Codes required once decision issued

System Operation

- Load Frequency Control Blocks - **decision published**
- Common Grid Model Methodology (CGMM) v3 – **All NRA decisions published**
- Key Organizational Requirements, Roles and Responsibilities proposal (KORRR) – **All NRA decisions published – current National consultation**
- Current ACER [consultation](#) on the Coordinated Security Assessment and Relevant Asset Outage Coordination Methodologies
- Synchronous Area Operational Agreement and LFC Block Operational Agreement - with RAs for decision (June deadline)

EUNC updates

Emergency Restoration Code

- TSOs consulted in late 2018 upon the following, which have now been submitted to the RAs for decision:
 - System Defence plan
 - System Restoration plan
 - Terms and conditions to act as a system restoration and/or system defence provider
 - Rules for suspension and restoration of market activities, and imbalance settlement in emergency or blackout states

EUNC updates

Electricity Balancing

- Imbalance Netting Implementation Framework- All NRA decision
- Recently submitted to All NRAs
 - Manual Frequency restoration reserves (MARI) Implementation Framework
 - Replacement Reserves Implementation Framework (TERRE)
 - Imbalance settlement Harmonisation
 - Pricing Proposals – Balancing energy
 - Activation Purposes of Balancing Energy Products
 - TSO-TSO settlement

EUNC - CACM & FCA

- The majority of CACM Methodologies have been approved.
- 4 FCA Methodologies are due to be reviewed for approval.
- Recent Decisions and Developments:
 - (CACM) Coordinated Redispatching & Countertrading Methodology and Cost Sharing Methodology
 - This methodology proposes a common approach within the Ireland-United Kingdom (IU) Capacity Calculation Region (CCR) for the economically efficient use of coordinated remedial actions which have the effect of relieving physical congestions within a control area of an IU TSO.
 - The cost sharing methodology proposes cost sharing solutions for actions of cross-border relevance.
 - A second request for amendment was issued by the IU NRAs to request further clarity and detail on 14 January 2019, with amended proposals due by 14 March 2019.

EUNC - CACM & FCA

- **(CACM) Day Ahead Calculation of Scheduled Exchanges**
 - The Scheduled Exchanges Proposal accommodates situations where there is more than one NEMO designated or offering trading services in a particular geographic area. This allows for the calculation of Scheduled Exchanges between bidding zones, scheduling areas and NEMO trading hubs.
 - The methodology for Day-Ahead Calculation of Scheduled Exchanges was approved on **14 February 2019**.
- **(CACM) Intraday Calculation of Scheduled Exchanges**
 - This methodology has been approved through the Energy Regulator's Forum subject to receiving a revised proposal which addresses some minor issues.
 - National decisions will be published on the **14 March 2019**.
- **(CACM) Capacity Calculation of Regions**
 - ACER held a public consultation on amendments to the determination of capacity calculation regions, which closed on **17 February 2019**. This concerns the reallocation of bidding zone borders.

EUNC - CACM & FCA

- **(CACM) Pricing of Intraday Capacity**
 - In order to harmonise capacity calculation and allocation in the DA and ID cross-zonal markets, it is necessary to define a way to price intraday cross-zonal capacity. This is becoming increasingly important as more renewable power enters the grid. This methodology was referred to ACER.
 - ACER published its decision on **25 January** which includes three implicit pan-European intraday auctions to price cross-zonal capacity, at 15:00 on D-1, at 22:00 on D-1 and at 10:00 on the delivery day.
 - This will complement single intraday coupling based on continuous trading.
- **(FCA) Congestion Income Distribution Methodology**
 - A request for amendment was issued on the **21 December 2018** as the methodology requires some additional clarity and detail.
- **(FCA) Capacity Calculation methodology & (FCA) Methodology for splitting long-term cross-zonal capacity**
 - These methodologies were received by the IU NRAs on **23 January 2019** and are currently being reviewed

EUNC – forthcoming CACM & FCA

- Upcoming ACER Regulation
- MNA Implementation
- Monitoring and Enforcement of CACM and FCA Implementation

RA summary

- Questions ?
- Please request workshops
- Watch out for consultations
- Engage at Grid Code/Distribution Code
- Please ensure your businesses are informed

Thank you!

ENTSO- E

Derek Lawler

ENTSO-E

All-island Network Code Stakeholder Forum
Dublin
February 21st 2019



Digital committee

Resource committee

ASSEMBLY

Board

Advisory Council

Legal and
Regulatory Group

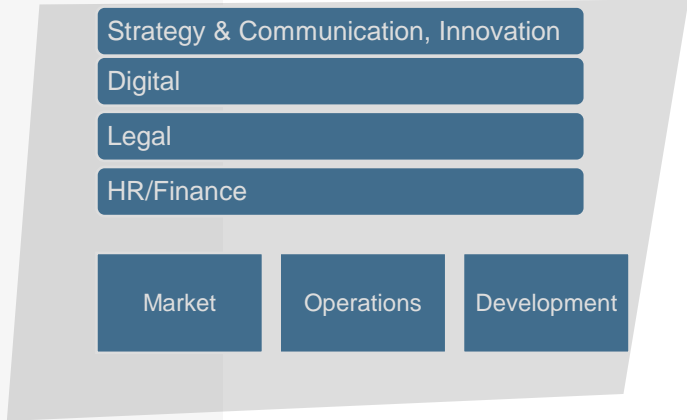
Secretariat

Market Committee

System Operations
Committee

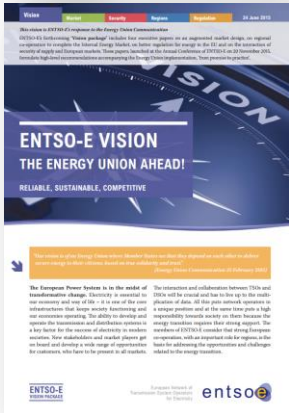
System Development
Committee

Research, Development
and Innovation Committee



What does ENTSO-E do?

Contributes to the design and implementation of the Internal Energy



Develops the necessary IT tools for enabling the implementation

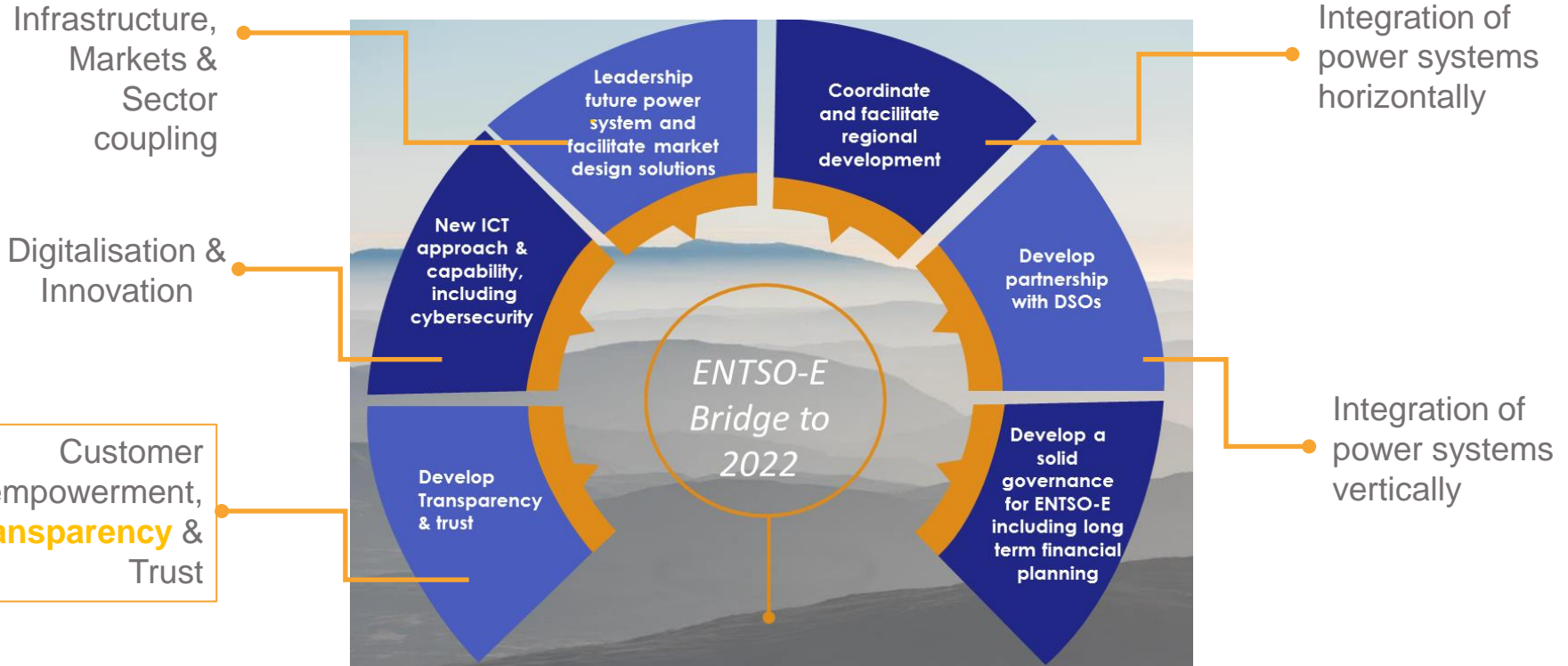


Common Grid Model

Provides regular reporting and recommendations for the development of the network



ENTSO-E ROADMAP **ACTING ON ALL DIMENSIONS** of the ENERGY TRANSITION



The EU network codes: Made-in Europe rulebook for the smart system of the future

3 Market

- Capacity calculation
- Capacity Allocation and Congestion Management (CACM)
- Electricity Balancing

2 Operation

- Emergency and Restoration
- System Operation

3 Connection

- HDVC
- Demand connection
- Requirements for generators

All approved by
Member States

2017

FULL
implementation

2022

5 years

Download the E Codes app



Access all codes

Track implementation deliverables

Codes-related public consultations, events and news



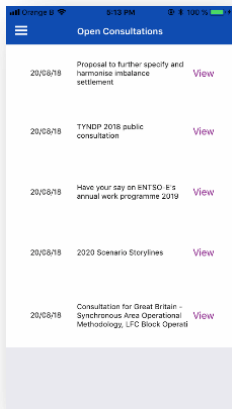


E-codes: App

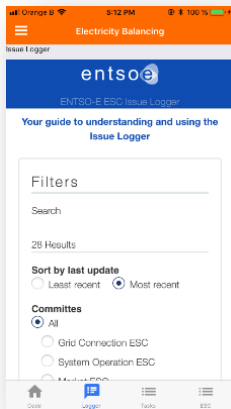
And all this information available in your pocket? **E-Codes App**



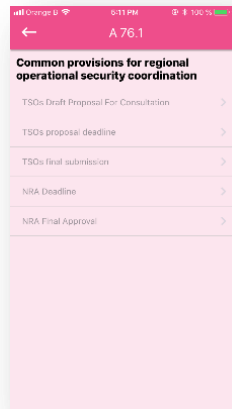
Consultations



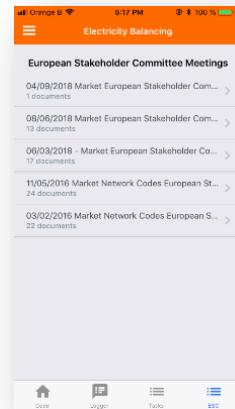
Events



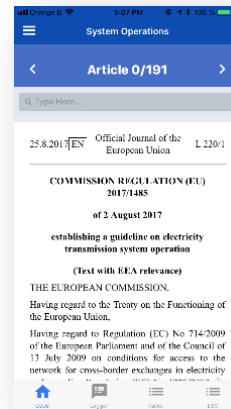
Network codes



Status of deliverables



Issue log



And way more

We recorded 900 downloads since the launch in September 2018
App is available for iOS and Android in [apple store](#) and [google play](#)

ENTSO-E – NCIP: Website

What's new?

- Enhanced ENTSO-E website to facilitate NC monitoring of deliverables released
- Status of Pan-European and regional NC implementation is now easy accessible

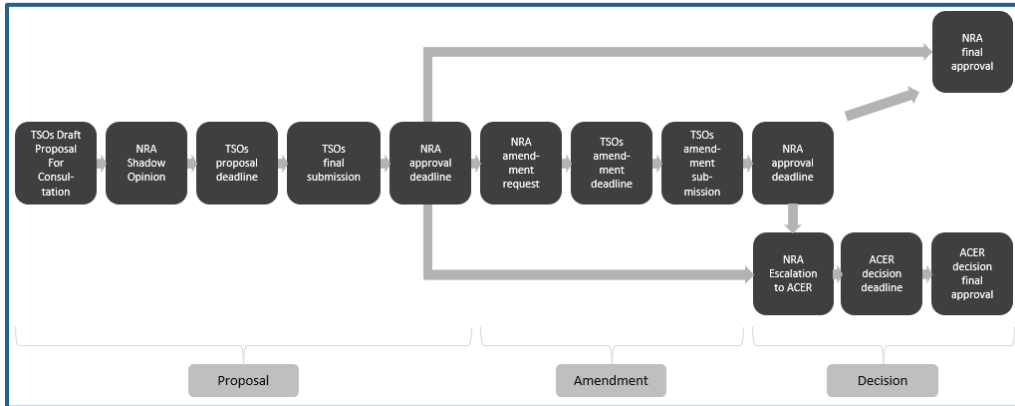
1 Go to <https://www.entsoe.eu/>

2 Click on **Network Codes** and select the **Code Family**

3 Scroll down to see the **Timeline** and the **Overview of each deliverable**

ENTSO-E – NCIP: Website

Operative perspective



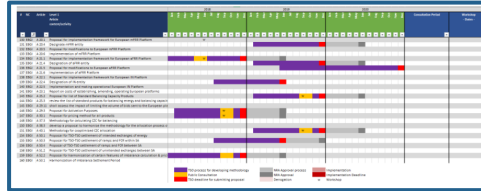
Benefits

- Updated ENTSO-E website to facilitate NC monitoring of deliverables
- Consolidated data with gathered NC requirements and further information on national, regional and Pan-European level
- Standardized and incorporated time planning for each NC
- Quick access to proposal files

ENTSO-E – NCIP: Website

Functions

Integrated **Timeline**, which is automatically updated



CACM Deliverables

A 10 Organize Day Ahead and Intraday coupling - TSOs...	Show
A 15.1 Develop proposal for determination of capacity calculation regions...	Show
A 16.1 Develop proposal for Generation and Load Data Provision...	Show
A 16.6 List of entities to provide information & content...	Show
A 17.1 Develop proposal for Common Grid Model Methodology	Show
A 20.2 Submit a proposal for a common coordinated capacity...	Select

List of deliverables for each code family

Status of each deliverable with corresponding documents

ER Deliverables

A 04.4 Develop a proposal for Terms and conditions to...		CEPS
A 04.4 Develop a proposal for Terms and conditions to...		Select
A 04.4 Develop a proposal for Terms and conditions to...		APG
A 04.4 Develop a proposal for Terms and conditions to...		Ela
A 04.4 Develop a proposal for Terms and conditions to...		EAD
A 04.4 Develop a proposal for Terms and conditions to...		HOPS
A 04.4 Develop a proposal for Terms and conditions to...		Cijss
A 04.4 Develop a proposal for Terms and conditions to...		CEPS
A 04.4 Develop a proposal for Terms and conditions to...		Energinet
A 04.4 Develop a proposal for Terms and conditions to...		HOPS
A 04.4 Develop a proposal for Terms and conditions to...		Fingrid
A 04.4 Develop a proposal for Terms and conditions to...		RTE
A 04.4 Develop a proposal for Terms and conditions to...		German TSO's
A 04.4 Develop a proposal for Terms and conditions to...		National Grid
A 04.4 Develop a proposal for Terms and conditions to...		IPFO
A 04.4 Develop a proposal for Terms and conditions to...		MAVIR
A 04.4 Develop a proposal for Terms and conditions to...		Landsnet
A 04.4 Develop a proposal for Terms and conditions to...		Fingrid

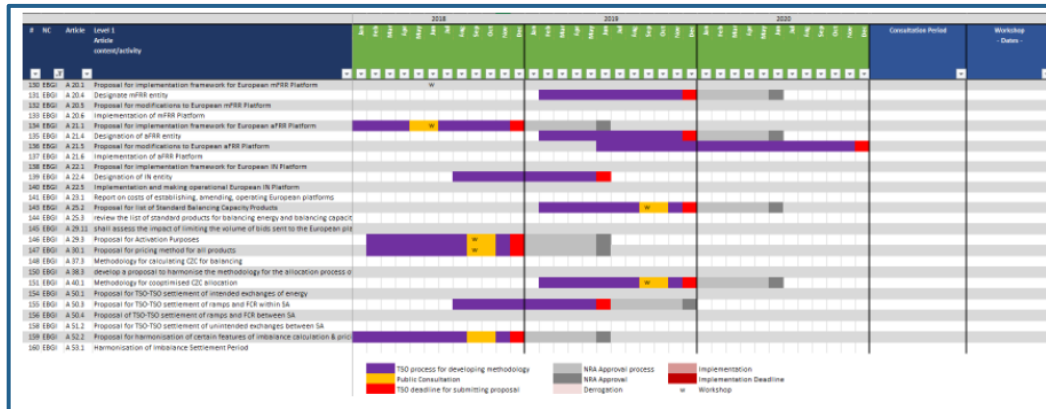
TSO's Draft Proposal For Consultation 1/19/2018	TSO's final submission 18/12/2018	100% approval deadline 18/06/2019
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Description

- Showing NC Pan-European and regional deliverables for each Code Family
- Time planning for each NC available
- NC implementation process incorporated

ENTSO-E – NCIP: Website

Function



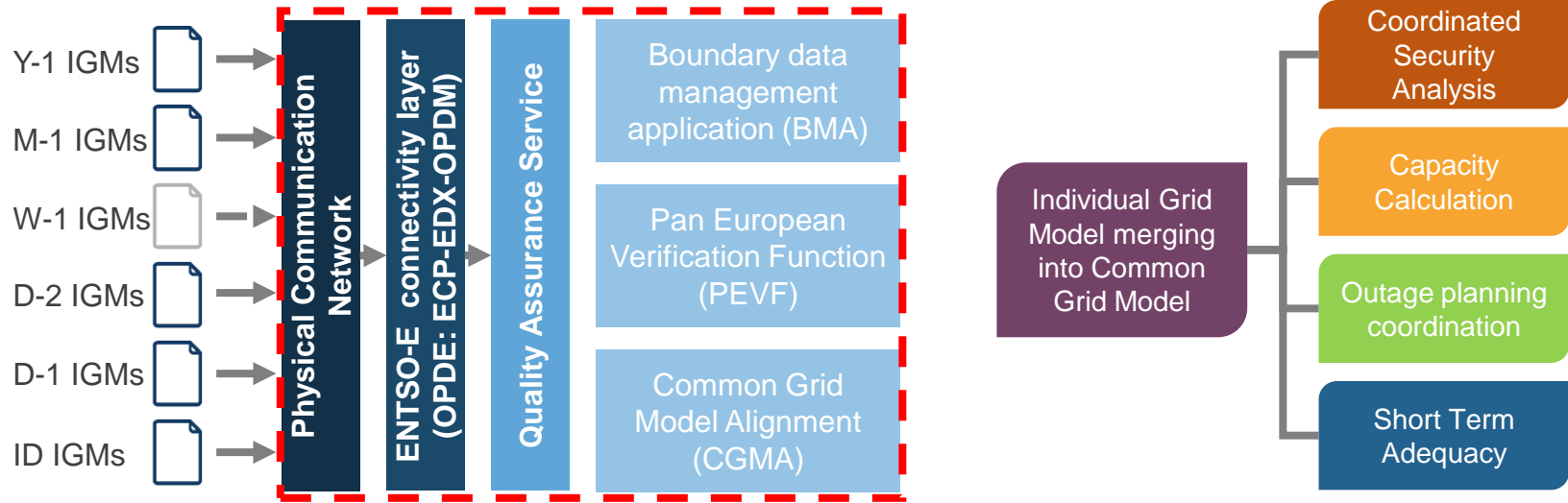
Description

- Time planning for each NC available
 - Color code for all NC established
 - showing drafting process, consultations, workshops, deadline for submission or NRA processes
- Each NC deliverable is scheduled
- Each Stakeholder on regional and national level considered
- Time planning amendments via NC advisor

Regional TSO coordination: springboard for innovation and smart power



CGM Program scope summary



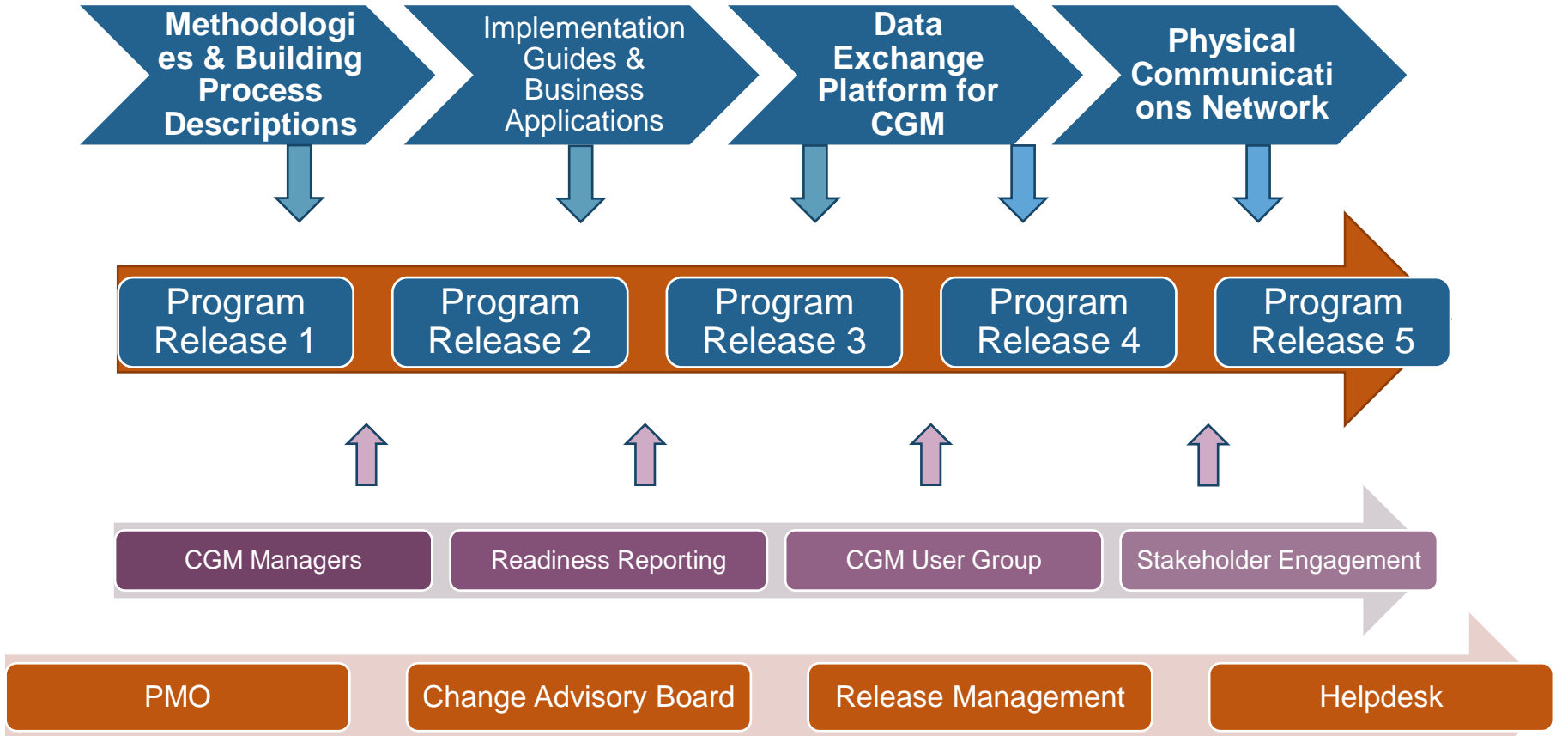
TSOs

CGM Program

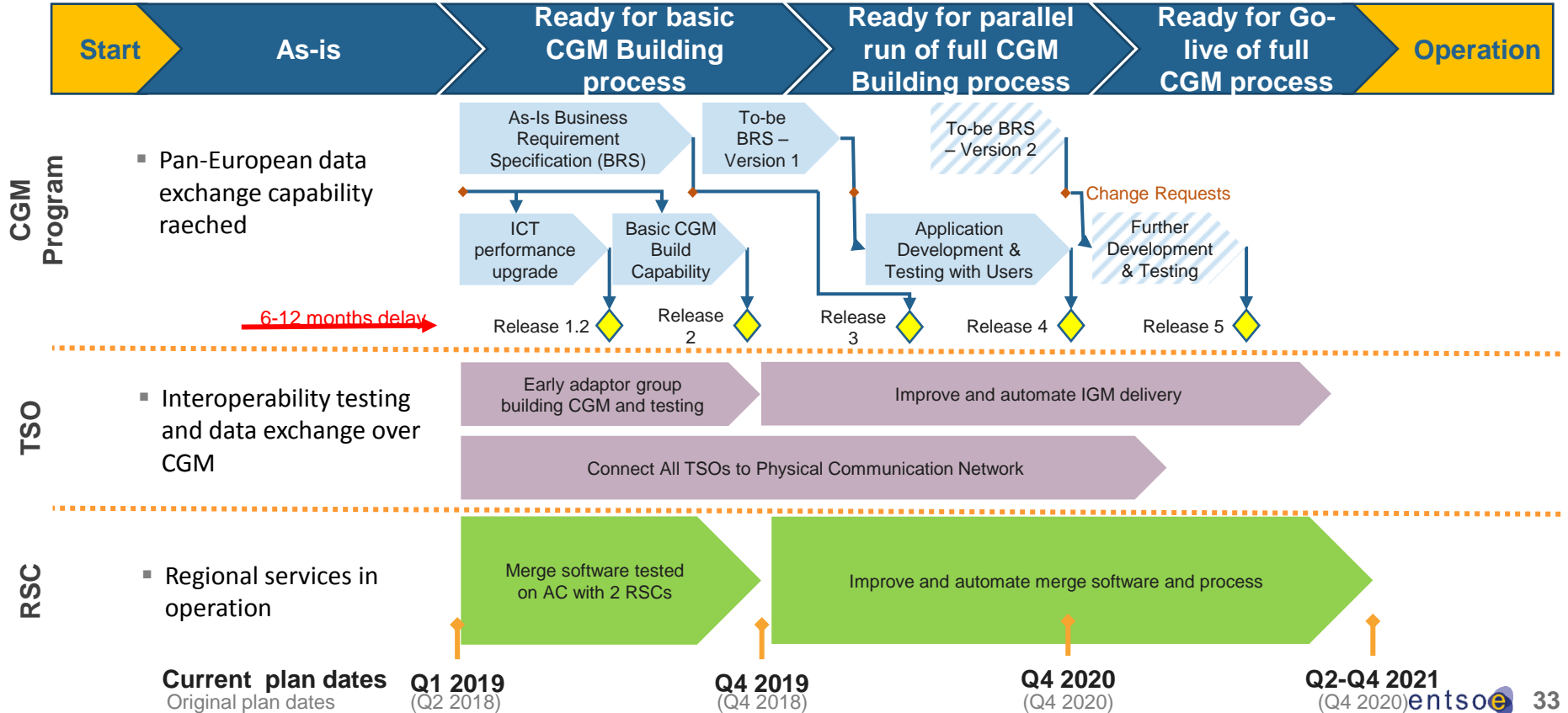
RSCs

Success will only be achieved by the integration of the CGM Program, TSOs and RSCs

CGM Program Plan Structure

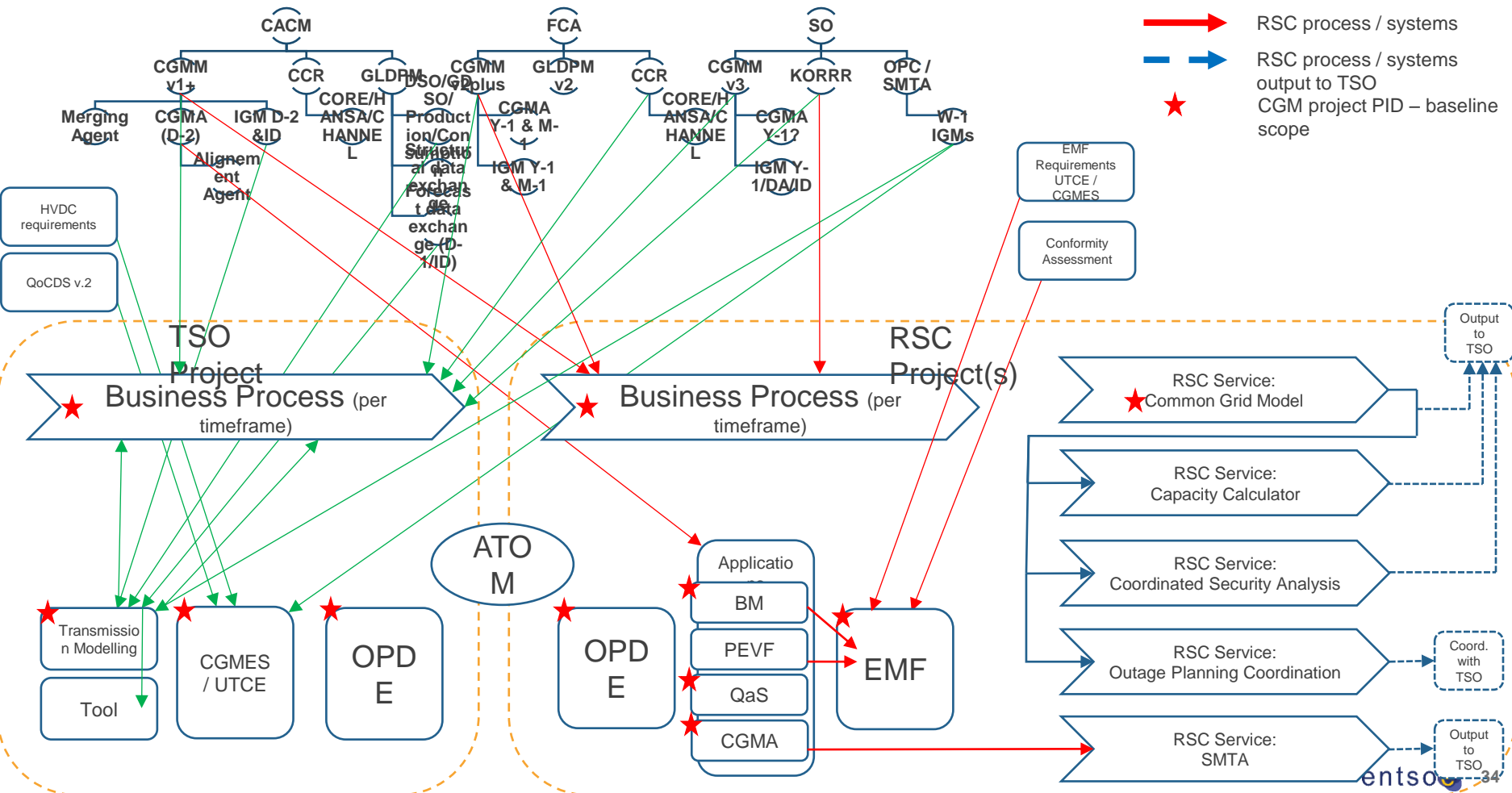


High-level CGM Program plan



Note: End of parallel run - Further analysis and discussion required, before these dates can be agreed for the overall CGM Program plan

- TSO process / systems
- RSC process / systems
- RSC process / systems output to TSO
- ★ CGM project PID – baseline scope



OPDE connection status R1.0

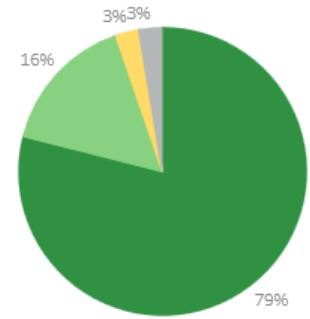
CGM Program Status for OPDE Roll-out Completeness

Due : 8/1/2018

Last update: 1/25/2019 4:25:47 PM



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Status Legend

Fully Compliant - passed connectivity test



All component registered



ECP & EDX registered



NA

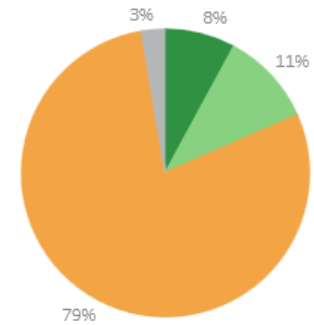
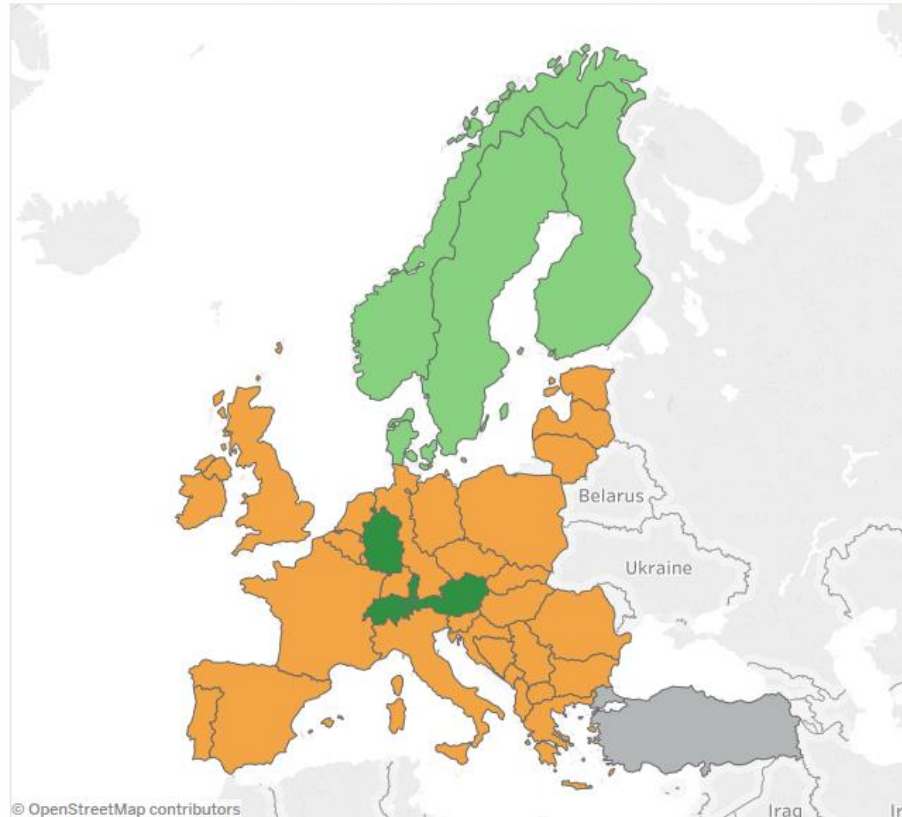


Physical Network connection Status

CGM Program Status for Current Network connection

Due : 8/1/2018

Last update: 1/25/2019 4:25:47 PM



Status Legend

Atom Core 

Nordic RPN 

Internet 

NA 

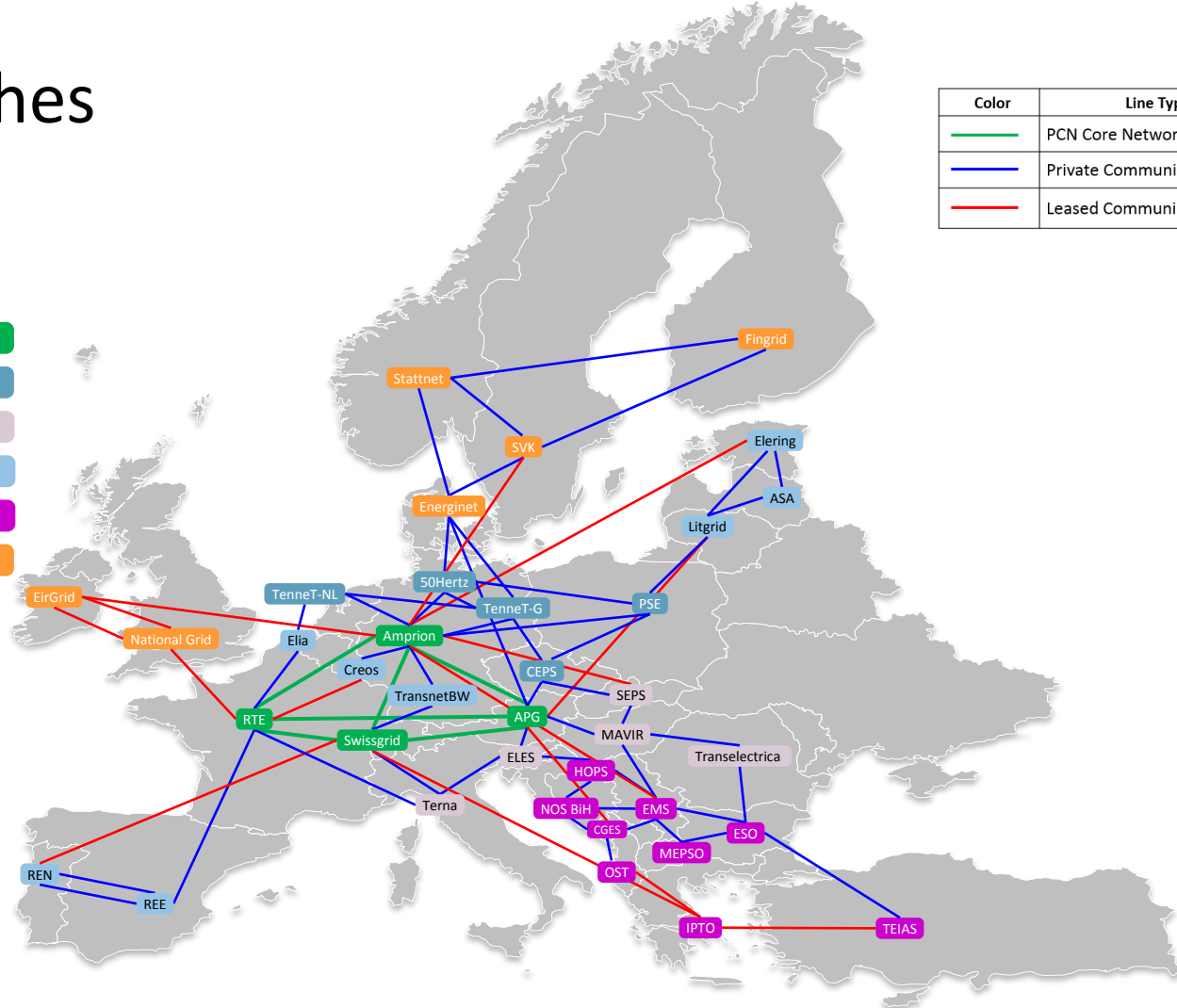
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PCN Batches

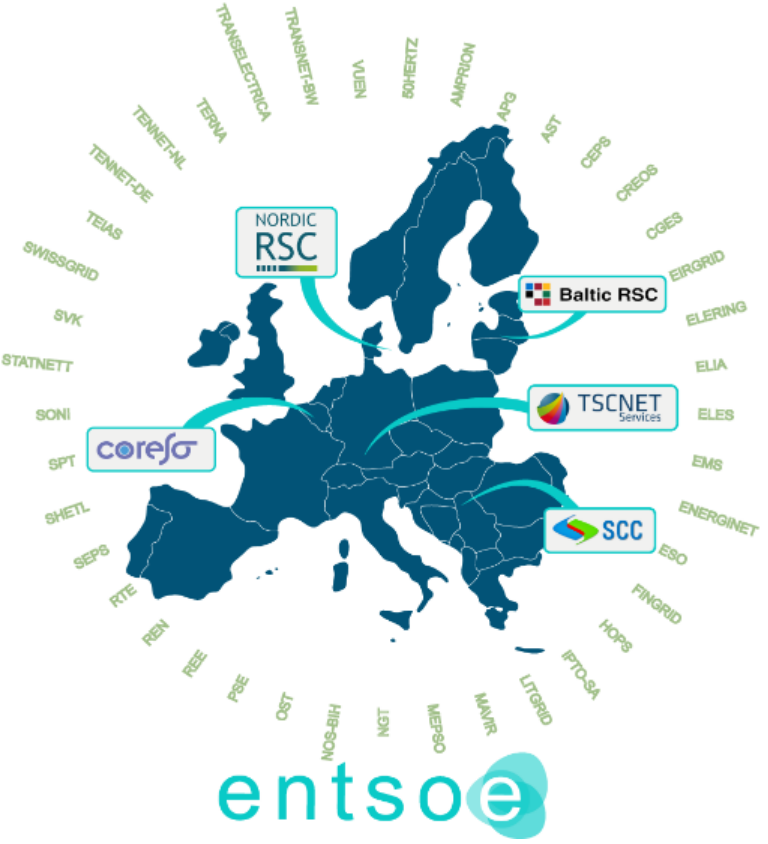


- ATOM Core – 4 TSOs - In place
- BATCH 1 – 5 TSOs – Q3/Q4 2019
- BATCH 2 – 5 TSOs – Q1/Q2 2020
- BATCH 3 – 8 TSOs – Q2/Q3 2020
- BATCH 4 – 9 TSOs – Q3/Q4 2020
- BATCH 5 – 6 TSOs – Q1 2021

Color	Line Type	Status
—	PCN Core Network	In operation
—	Private Communication Line	To be Implemented
—	Leased Communication Line	To be Implemented



The new faces of TSO regional coordination



entsoe

Transformative changes



Clean Energy Package

Paris agreement



THANK YOU FOR YOUR ATTENTION

Our values define who we are, what we stand for
and how we behave.

We all play a part in bringing them to life.





DSO update

Tony Hearne



ESB Networks : RfG

- Modifications with CRU (Pre-RfG)
 - Mod 36 - 1 MW threshold for controllability and inclusion of PPMs, to cover Solar Farms and Batteries.
 - Mod 43 - Proposed Distribution Code structural changes to facilitate adoption of RfG.
- Transposition of RfG requirements into the D-Code
 - Transposition of D-Code very near completion, on the assumption that mod 43 will be approved.
 - It is important to ensure visibility of the requirements to generators from November 2018. Until there is a full re-work of the D-Code it is considered inappropriate to circulate a separate document outlining RfG mandatory and exhaustive parameters. It is planned to use the D-code mailbox to liaise with generation customers seeking clarification on RfG standards.

ESB Networks : RFG

- Content category indication
- Intention to provide subtle indication to reader of content that is:
 1. New content driven by EUNC
 2. Existing content changed by EUNC
- Existing “Types” re-defined as “Topologies
- Opportunity taken to make better graphics
- Tweak text and graphics to clarify queries that have arisen over the years

DCC11.5.3.2 Power Factor Control Mode

For the purpose of power factor control mode, the PPM shall be capable of controlling the power factor at the Connection Point within the required Reactive Power Range with a target power factor in steps no greater than 0.01. The target power factor shall, with a tolerance of 0.01, be the value specified in the PPM's MEC. The period of time to achieve the target power factor following a change of Active Power output are specified in Table 17.

Parameter	Value	Type	Applicability
Target power factor	Site-specific		
Time period to reach the set point	90% within 1 s		C and D PPMs
Tolerance	0.5%		

The Reactive Power requirements are determined by local factors and depend highly on the subset of generators and loads connected to local transmission/distribution system and the supplementary Reactive Power consumption of overhead lines and cables. To meet the local needs in terms of Reactive Power requirements, the power factor control mode the target power factor shall be site-specific.

DCC11.6 SIGNALS, COMMUNICATIONS & CONTROL

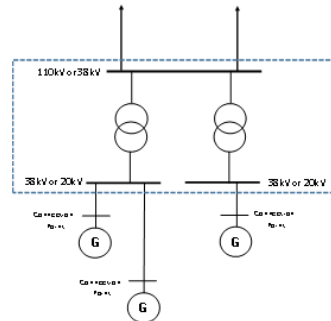
DCC11.6.1 Signals from the PPM to TSO

Signals from the PPM to the TSO shall be broken up into a number of logical groups. There are different requirements for PPMs depending on the PPM's MEC size. Refer to Table and Table x for a summary of the signal requirements for different PPM MEC.

The following groups shall apply:

Connection Topology

PPMs are classified as being connected to the TSO at 2 connection topologies when connected at a Distribution System voltage ($\leq 38 \text{ kV}$) to a dedicated PPM(s) 110kV station. There are no load Customers connected to the DSO open at 38/20/10kV busbar(s).



ESB Networks : RFG

- Intention remains to have a first draft of RfG D-Code ready for consideration by the DCRP once outstanding modifications have been approved.



ESB Networks : DCC

Background

- DCC code established and in effect 7th September 2016
- Requirements come into effect three years after above date.
- Requirements on General Frequency, Voltage, Short Circuit Level, Reactive Power, Protection, Control, Power Quality, Demand disconnection and Demand reconnection
- Demand response services provided to system operators shall be distinguished based several categories

Applies to:

- New distribution systems, including new closed distribution systems
- New demand units used by a demand facility or a closed distribution system to provide demand response services to relevant system operators and relevant TSOs
- Existing facilities if cost benefit analysis deems it suitable

ESB Networks : DCC

Work completed:

- Joint SO consultation on relevant parameters completed and closed August 2018
- DSO parameters submitted to CRU for their consideration and approval September 2018

Next:

CRU approval of parameters / Meetings with CRU as required

Progression of Distribution Code mods post approval of parameters by CRU – June 2019

ESB Networks : ER

Background (As of the last Update):

- 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration
- Code fixes the processes that the TSO/DSO must follow when they face an incident on their grid.
- Regulation deals with the establishment of ‘crisis scenarios plans’ both at regional and at national levels.
- The Network Code on Emergency and Restoration deals with National System defence plans with consultation between countries.
- Part of the System Operation Code Family – A number of overlaps with SOGL Code

ESB Networks : ER

Updates November 2018 – January 2019

- System Defence Plan: Open Consultation
- System Restoration Plan: Open Consultation
- November 2018 - Eirgrid published Open Consultation Documents on an Irish System Defence and System Restoration Plan. During this consultation, ESN engaged with Eirgrid on the documents and worked closely on getting full clarity on the wording of the proposed text.
- The consultation closed on the 13th of December 2018 – ESN are largely in agreement with Eirgrid on the content for these consultation documents – minor changes were accepted by both parties.
- On the 4th of February 2019 Eirgrid published the System Defence and Restoration Plans as Proposals – this included a number of clarifications requested by ESN.
- ESN will engage further with Eirgrid in 2019 on the design of an updated Blue Alert and Black Start Plan.

ESB Networks : ER

SGU (Significant Grid Users) Update

- SGU List – Special Conditions Apply for DSO connected Generators
- In January Eirgrid provided ESNB with the DSO connected ER SGU list
- Type C and D Generators > 5 MW
- <5 MW – 100 kV TSO Connected Type C and D
- The list includes DSO connected Generator / Aggregator SGUs and also Wind/PV SGUs
- ESNB need to clarify how these DSO generators will be notified

ESB Networks : ER

Next:

- 2019: Response from CRU on the Open Consultation for System Defence and Restoration Plans
- 2019: Continued Engagement between Eirgrid, ESNB and the CRU to ensure targets timeline is met
- 2019: Development of an updated Blue Alert and Black Start Plan between Eirgrid and ESNB
- 2019: Clarification for ESNB requirements on Article (40) Data Exchange and also Article (41) Communication Systems

ESB Networks : SOGL

Background

- 2017/1485 of 2nd August 2017 and came into force on 14th September 2017 establishing a Guideline on Electricity Transmission System Operation
- Network Operators or Users defined are TSOs, DSOs, CDSOs, SGUs & NEMOs
- Part of the System Operation Code Family: Overlaps within this code with all of the other 7 network codes, including Emergency Restoration [Regulation 2017/2196]

Methodologies which involve DSO

- Article 40: KORRR [Key Organisational Requirements, Roles & Responsibilities]
- Article 75: CSA[Co-Ordination of Security Analysis]
- Article 84: RAOC [Relevant Assets for Outage Co-ordination]

ESB Networks : SOGL

Updates: KORRR

Approved by TSOs: March 2018

Amendment request by NRAs: July 2018

We welcome the changes proposed in amendment; in particular:

- Continued use of language requiring agreement between TSOs and DSOs across all articles.
- Clarity around responsibilities for communication links being defined at national level
- Reduction in listed timeframe for notification of changes for all parties under Articles 8, 11 & 15 back to 3 months from 6 months.

Implementation processes in progress between DSO & TSO [More on this later]

- TSO & DSO Co-ordinated Requirements of SGUs : In Public Consultation
- DSO and TSO Requirements for each other: Not started yet. Kicking off shortly

Processes for Data Exchange to be determined by 14th March 2019

ESB Networks : SOGL

Updates: CSA & RAOC Methodologies

Approved by TSOs: Oct 2018

Approved by NRAs:?

By 3 Months after approval by NRAs:

- Lists of relevant power generating modules and relevant demand facilities
- Lists of relevant grid elements

However, this ties in directly with KORRR, as KORRR applies to these assets

Observability Area to first be assessed qualitatively

In synergy with KORRR, DSO and TSO Requirements : Not started yet. Kicking off shortly

From 2019 and every year thereafter.....by 1st July

- Update of the lists of relevant power generating modules and relevant demand facilities
- Update of the list of relevant grid elements

ESB Networks : SOGL

DSO Views

- We welcome a proportionate and balanced approach to Relevant Assets
- For ROI, scope of KORRR to be determined utilising Article 40.5
- To be proportionate, suitability of B,C & D Generators [under RFG] that are to be included is to be determined. CSAM & RAOCM employed.
- We recognise synergies between the CSA SGU List and the ER SGU List, the latter of which is now available.
- For Outage Planning, we recognise the flexibility in the SOGL allowing for adherence to alternative delivery dates if another synchronous area is not affected.

ESB Networks : SOGL

DSO Views

- For data exchange, we look to build and innovate upon processes and technologies that we already utilise
- For new processes, synergies and balance between compliance, requirements, suitability & costs
- We recognise the role that Data Exchange plays across all the Network Codes

Next

- Continue with KORRR & CSA/RAOC assessment & implementation to dates presented
- Identify amendments to ROI distribution code

EU NETWORK CODES

- All Island Forum Update 20/02/19

EU Codes that affect NIEN & its Customers

- Requirements for Generators (RfG) – significant impact for new generation connections
 - EIF May 2016, Generators connecting after 27th April 2019 must comply with RfG
- Demand Connection Code (DCC) – Only applies to new demand at distribution which intends to provide demand response
 - EIF Aug 2016, compliance required by Aug 2019
- System Operation Guide Lines (SOGL) – Mainly deals with how TSO operates the transmission system
 - EIF August 2017, majority of articles become active at 12, 18 and 24 months, small number of articles effective immediately

- Emergency & Restoration – Consultations complete on System Defence and Restoration plans



RfG Implementation - Update

- TSO/DNO consultation report on the proposals for General Application of RfG Requirements for NI approved by UR on 16th November 2018
- The agreed parameters have been updated to the draft G98/NI, G99/NI, D Code & PPM Setting Schedule documents
- Joint consultation on all 4 documents was issued early 10th January 2019 and closed on 15th February 2019
 - Consultation focused on document structure and new legal text only:
 - New RfG requirements are now required by law
 - The parameters have already been consulted on and approved
- Responses received are currently being reviewed
- Consultation report to UR early March
- Approved documents to be in place for 27th April 2019

G98/NI Drafting Update

- G98/NI replaces G83
 - Covers type tested generators up to 16A/phase
 - Also covers multiple premises in a close geographic area
 - Also covers generators <800W and storage but RfG specific requirements will not apply to these types
 - Non-type tested generators will be referred to G99/NI (G59 replacement)
 - Drafting has taken account of feedback from GB G98 consultation
 - Drafting includes parameters from the RfG consultation
 - Document circulated to DCRP members

G99/NI Drafting Update

- G99/NI replaces G59/1/NI
 - Covers type tested generators >16A/phase and <100kW
 - Covers all non-type tested generators
 - Will include all technical and compliance requirements for Type A and Type B generators
 - Will include all technical requirements for Types C & D generators, PPM compliance requirements will be detailed in the PPM setting schedule
 - Drafting includes changes as a result of feedback in GB
 - Drafting includes parameters from the RfG consultation

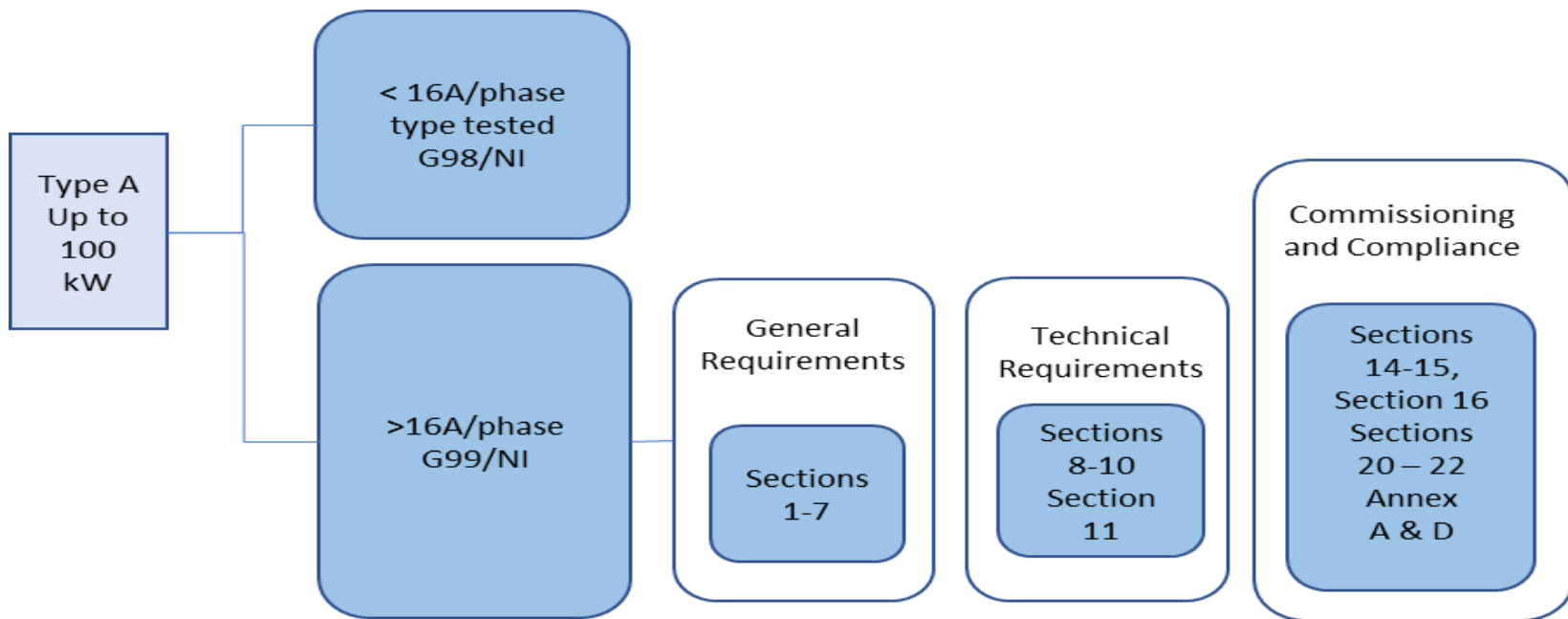
– Document circulated to DCRP members

– Joint consultation with G98/NI & D Code – 10th January to 15th February 2019

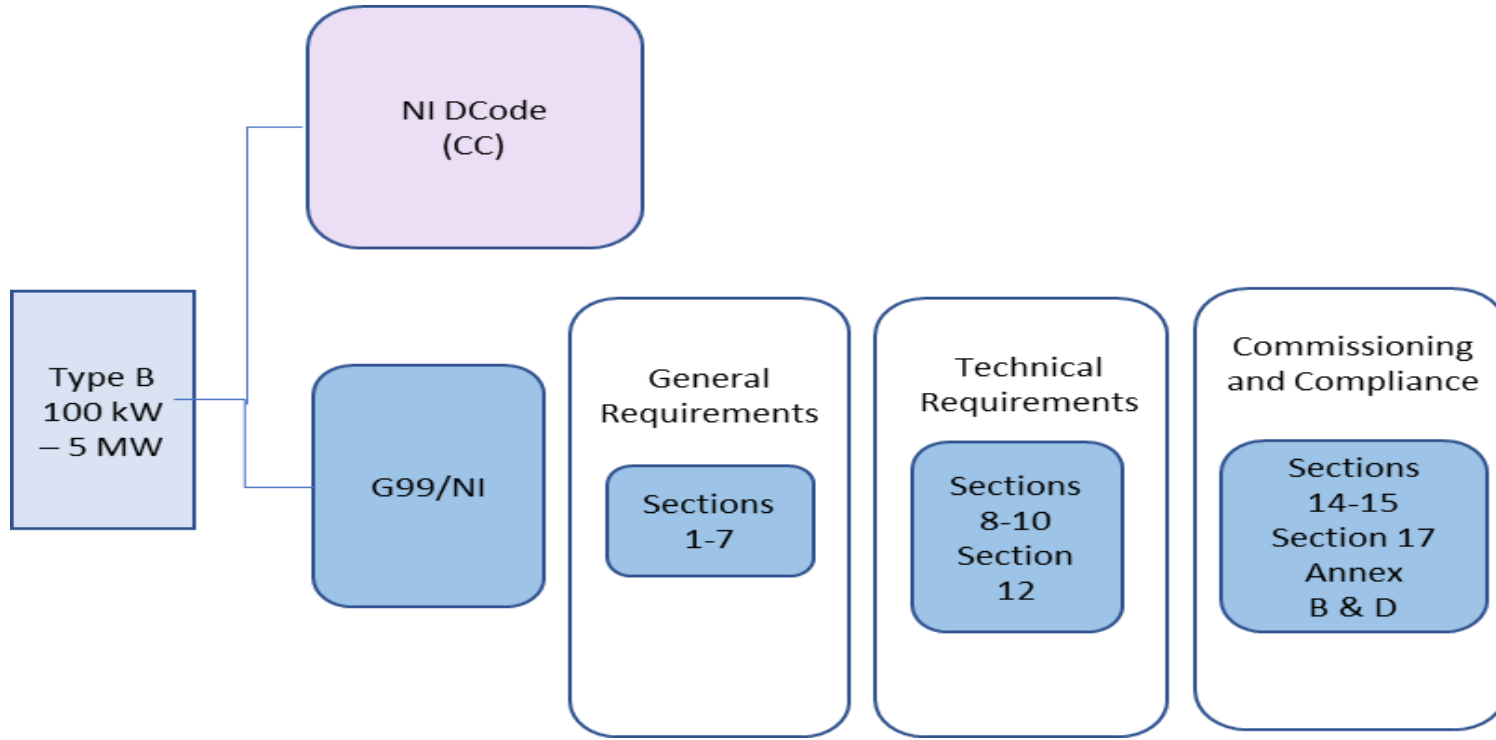
D Code Drafting Update

- D Code legal text changes required to take account of RfG
 - Drafting includes changes as a result of feedback in GB
 - Drafting includes parameters from the RfG consultation
 - Document circulated to DCRP members
 - Joint consultation with G98/NI & G99/NI – 10th January to 15th February 2019

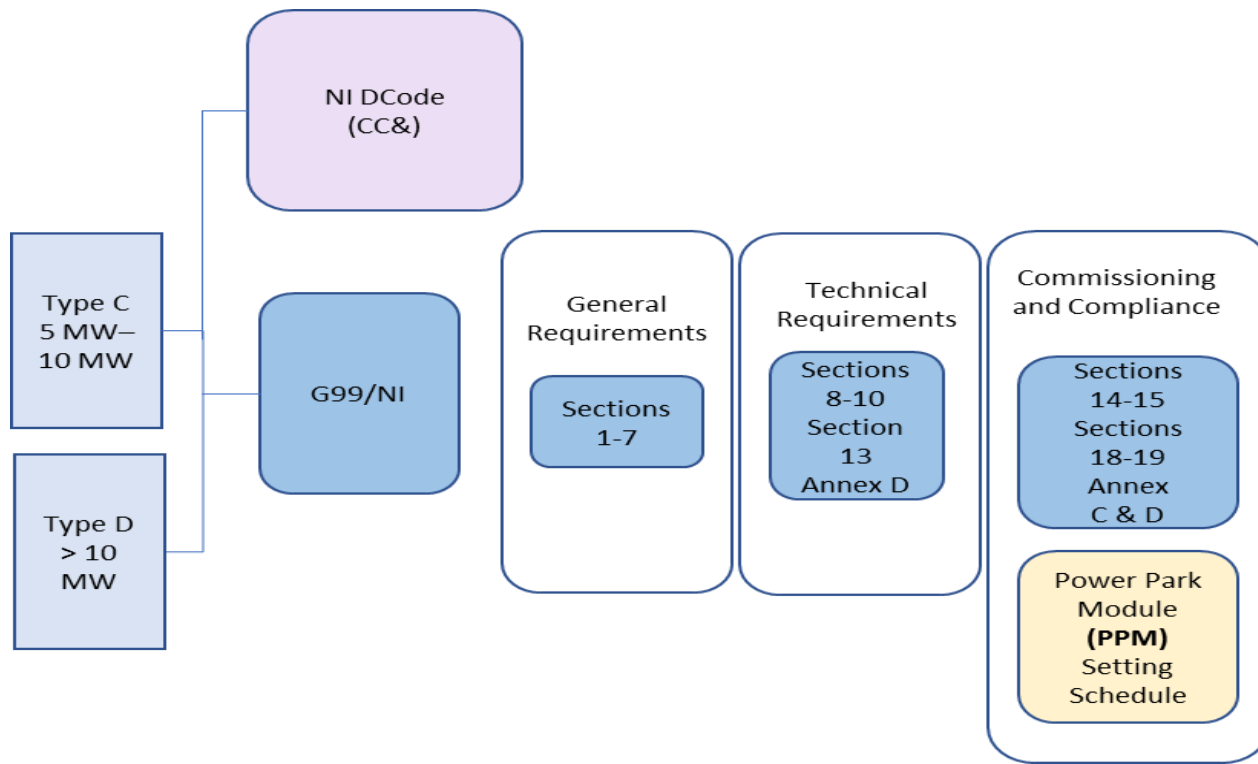
RfG Type A (800W – 100kW)



RfG Type B (100kW – 5MW)



RfG Type C & D (5MW – 10MW & >10MW)





The electricity balancing Guideline

John Young

What's it all about?

European
Balancing
Markets

Market &
Settlement
Harmonisation

Cross-border
Capacity
Reservation

- European platforms for exchange of **Standard Products**
- Implementation over several years (at least out to 2021)
- Harmonisation of gate closure time, pricing etc. for Standard Products
- Harmonisation of Imbalance Arrangements
- Opportunity for reservation of cross-border capacity for the use of balancing services



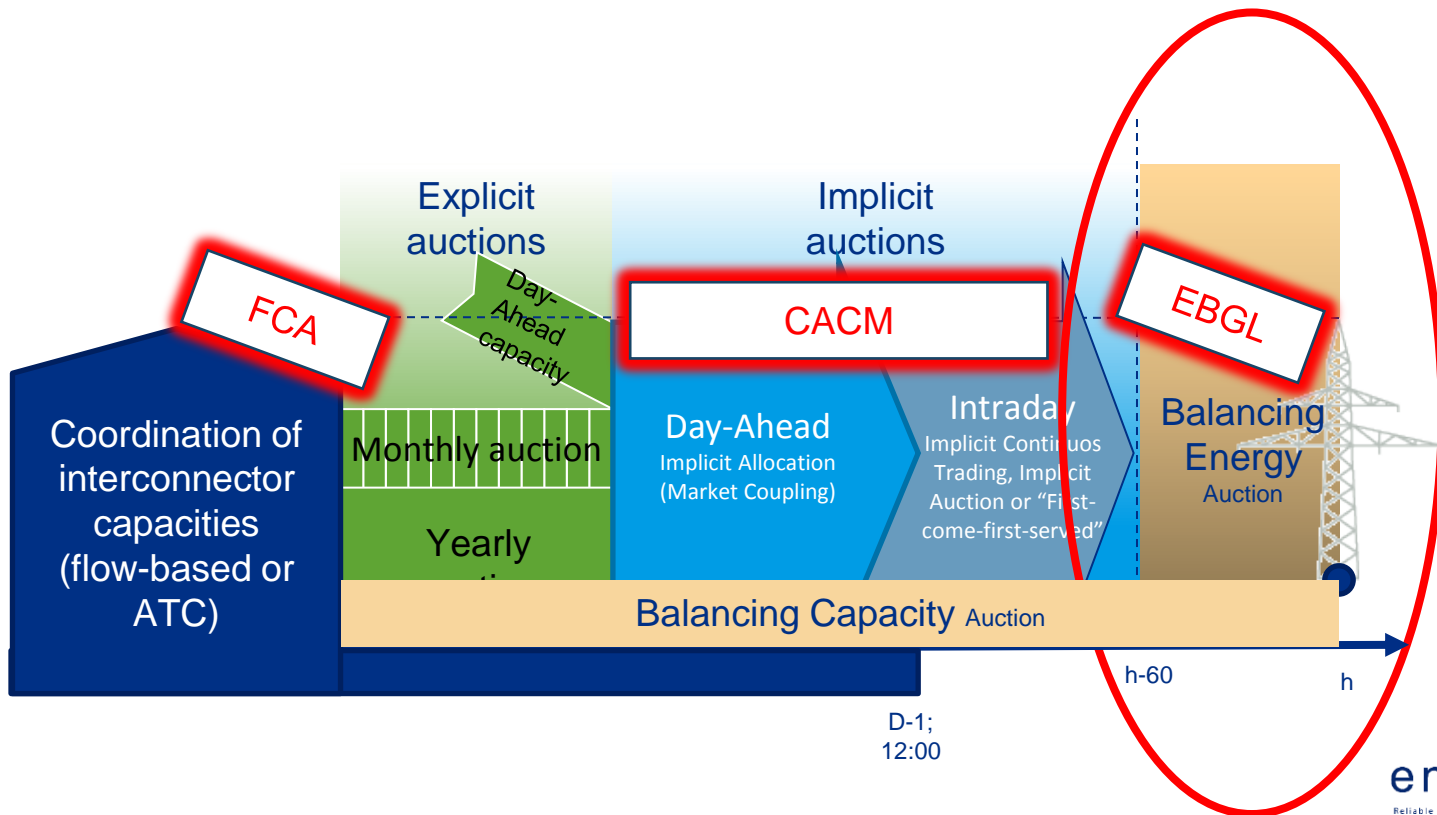
£/€





**INTRODUCTION:
Electricity Balancing Guideline (slides from ENTSO-E)**

The Internal Energy Market (IEM) and guidelines



Ancillary Services

Ancillary services are all services required by the transmission or distribution system operator to enable them to maintain the integrity and stability of the transmission or distribution system as well as the power quality in order to tackle:

- **Electric load** is greater or less than foreseen at the time of market-clearing
- **Renewable energy** generation is greater or less than foreseen at the time of market-clearing
- **Outages** (operational difficulties) of production units or from the transmission equipments
- **Internal congestion** (within market/balancing zone)

- Blackstart capability
- Reactive power
- Frequency control
- Ramping requirements
- Transient stability
- Rate of change of Frequency
- Inertia
- Virtual inertia

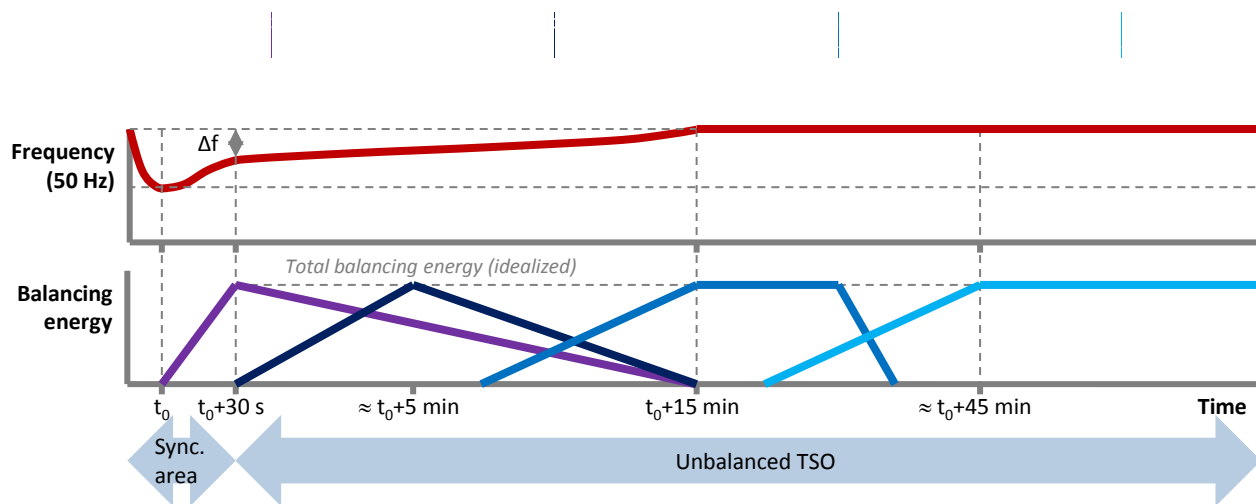
OUT of
SCOPE

Balancing

Electricity Balancing Guideline covers

- Frequency Containment Process
- Frequency Restoration Process with automatic activation (aFRR)
- Frequency Restoration Process with manual activation (mFRR)
- Replacement Process (RR)

Load-frequency control processes

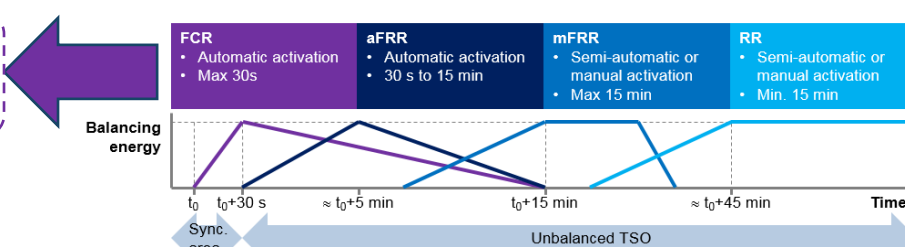


Up to 5 steps:

- Frequency containment reserves (**FCR**);
- Imbalance netting (**IN**);
- Frequency restoration reserves with automatic activation (**aFRR**);
- Frequency restoration reserves with manual activation (**mFRR**);
- Replacement reserves (**RR**).

Balancing platforms per product/process

No Common platform for FCR foreseen in EBGL



Each process has different specifications

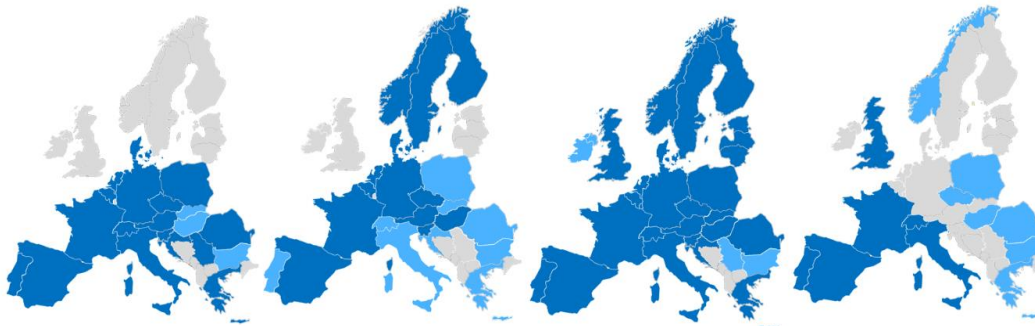
Each process has different timing

Imbalance netting:
IGCC

aFRR: PICASSO

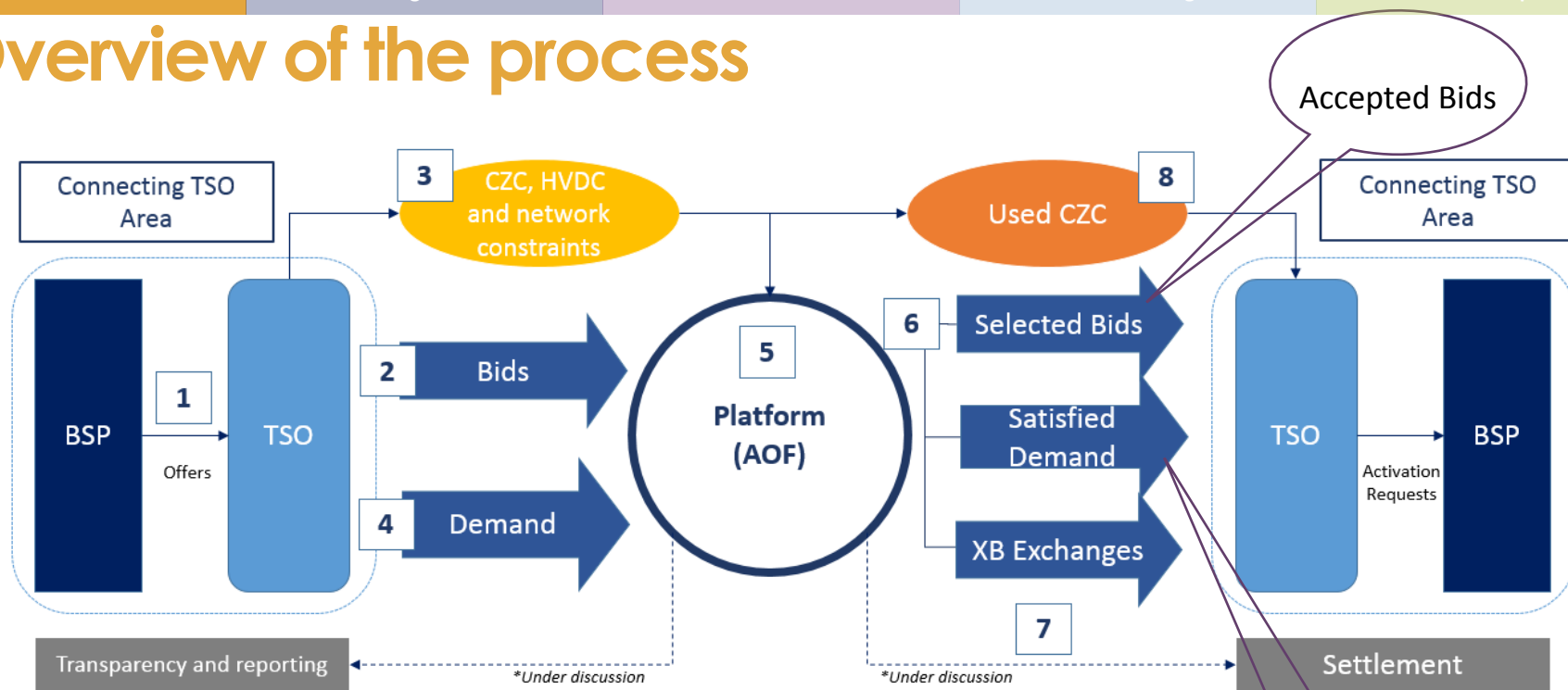
mFRR: MARI

RR: TERRE



Each process has different geographical scope

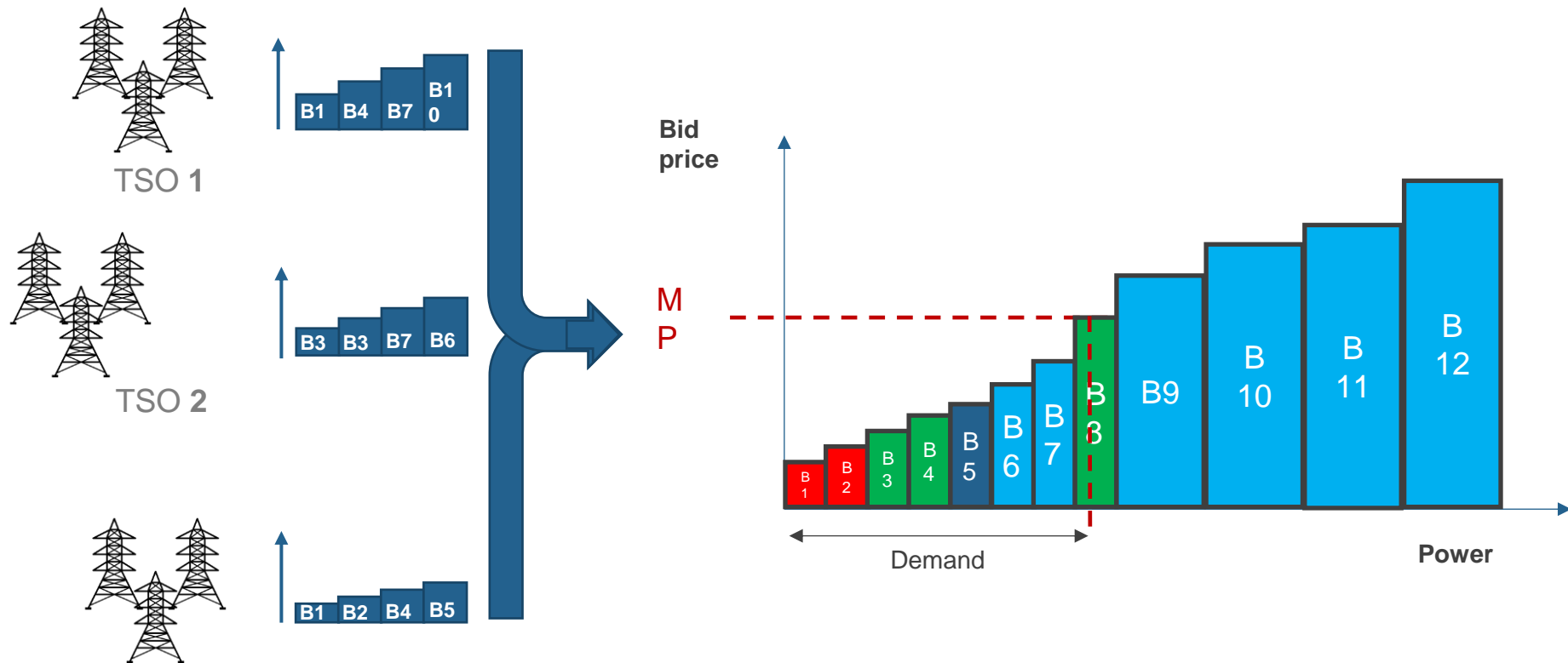
Overview of the process



List of abbreviations:

- **CMOL:** Common Merit Order List
- **AOF:** Activation Optimisation Function
- **CZC:** Cross-Zonal Capacity

Bids, demand and Needs: CMOL and Pricing



Bids, demand and Needs: CMOL and Pricing

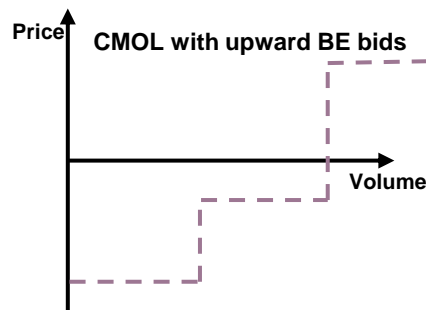


Figure 1. Downward demand
(Negative imbalance demands)

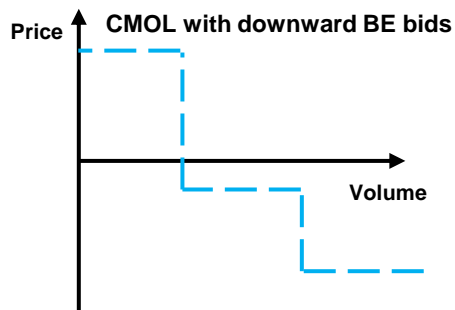
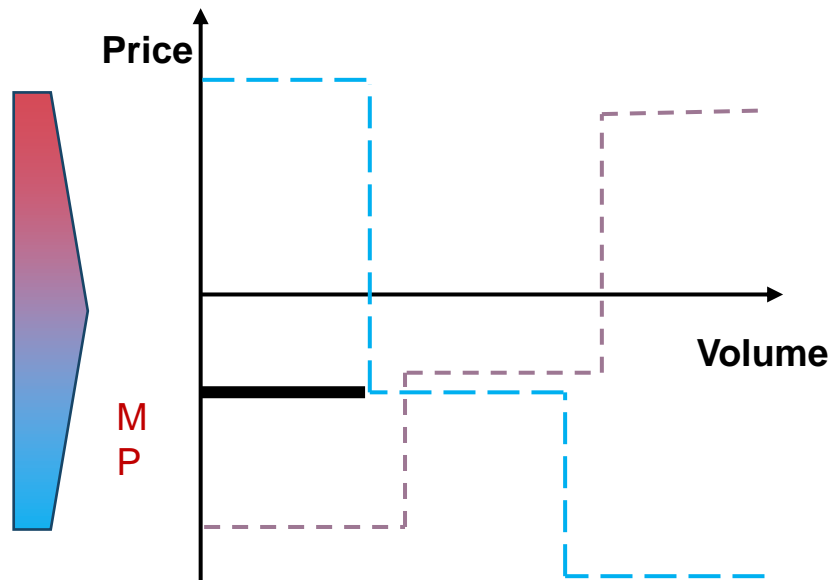


Figure 2. Upward demand
(Positive imbalance demands)

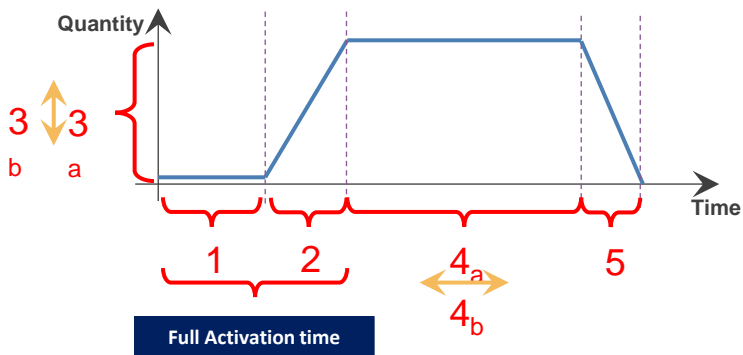
Upward regulation price → BSPs **sales** price of balancing power
→ TSOs **purchase** electricity to the market players



Downward regulation price → BRPs **purchase** price of balancing power
→ TSOs **sales** electricity to the market players

STANDARD PRODUCTS: fixed characteristics

Fixed characteristics of the standard balancing energy product bids



Mode of activation

Activation type

1- Preparation period

2- Ramping period

1+2- Full Activation time

6- Deactivation period

3_b- Min quantity

Bid granularity

3_a- Max quantity

4_b- Min delivery period

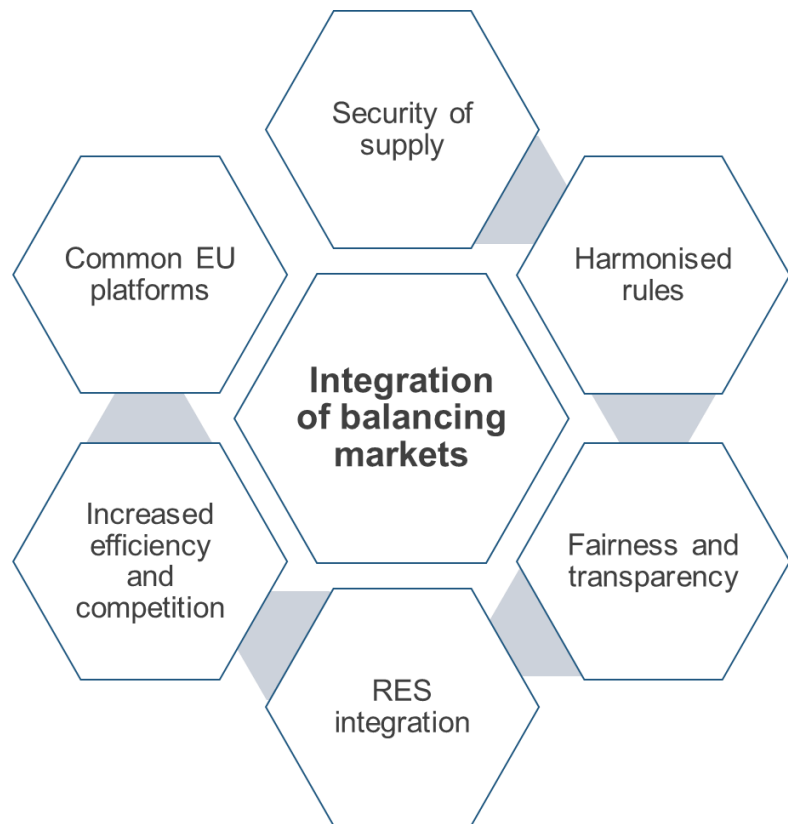
4_a- Max delivery period

Validity period

aFRR	mFRR	RR
Automatic	Manual	Manual and scheduled
	Direct or scheduled	
-		From 0 to 30 min
-		From 0 to 30 min
5 minutes (as of 18 Dec 2025)	12.5 minutes	30min
No longer than FAT		Under national responsibility
1 MW	1 MW	1MW
1 MW	1 MW	
9,999 MW	9,999 MW	In case of divisible bid, no max is requested only technical limit (IT limit). In case of indivisible bid, national rules will be implemented
No minimum delivery time shall be permitted.	5 minutes	15min
		60 min
15 minutes The first validity period of each day shall begin at 00:00. The validity periods shall be consecutive and not overlapping.	A scheduled activation can take place at the point of scheduled activation only. A direct activation can take place anytime during the 15 minutes after the point of scheduled activation.	Defined by BSP and respecting the min and max delivery period

What is the purpose of the guideline?

The main target of EBGL is to **integrate** and **harmonise** balancing energy markets through a **TSO-TSO model**, facilitated by **European platforms**





Key Organisational Requirements, Roles and Responsibilities (KORRR)

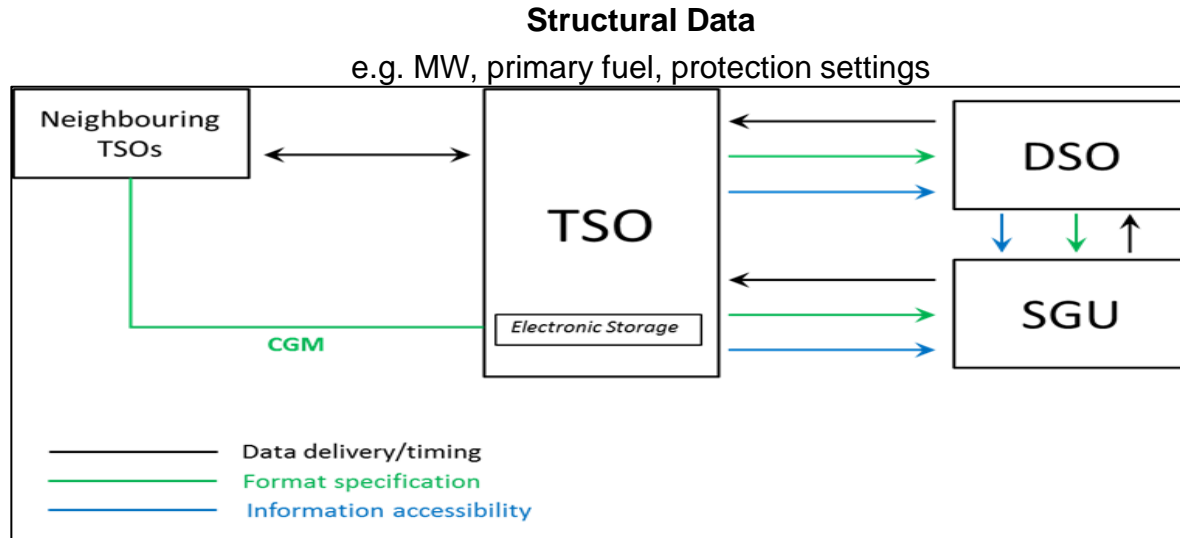


KORRR

- What is KORRR?
- Significant Grid User (SGU)
- Timeline
- Stakeholder Engagement
- Current Status of Data Exchange
- KORRR SGU Consultation
- Next Steps

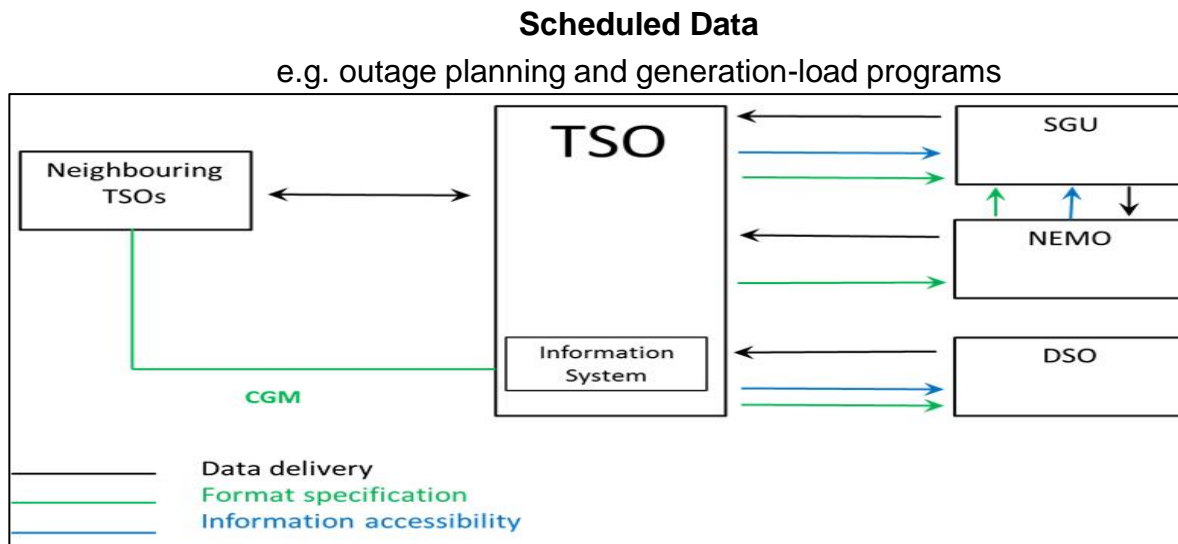
What is KORRR?

The purpose of KORRR is to define a common framework for **data exchange** between different parties to ensure the **operational security** of electricity systems.



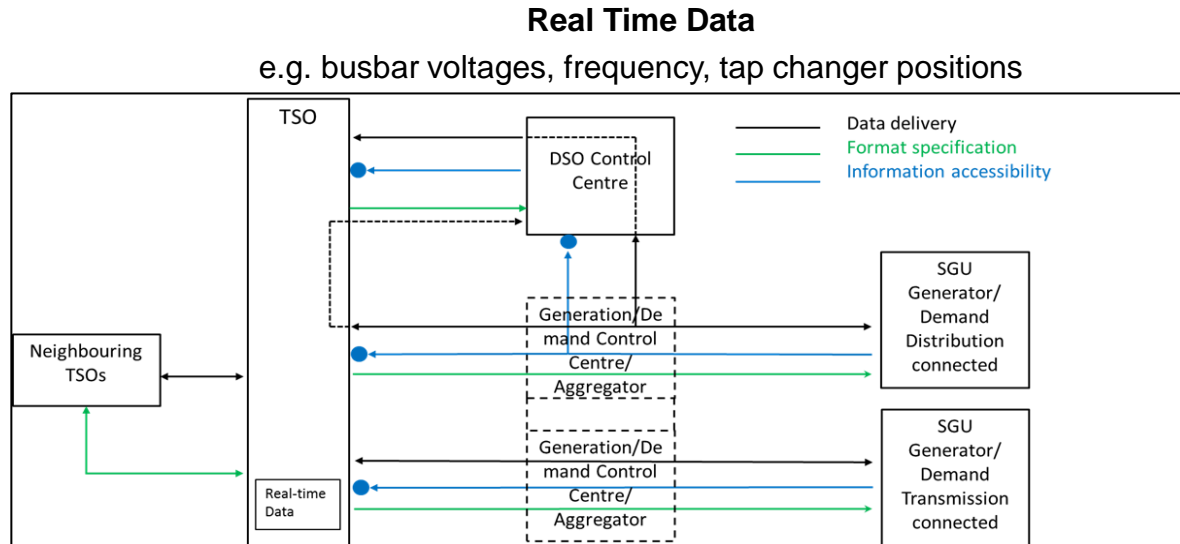
What is KORRR?

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What is KORRR?

The purpose of KORRR is to define a common framework for **data exchange** between different parties to ensure the **operational security** of electricity systems.



Significant Grid User (SGU)

- Existing and new:
 - type B, C and D PGMs as per RfG;
 - transmission-connected demand facilities;
 - transmission-connected closed distribution systems;
 - demand facilities, closed distribution systems and third parties providing demand response directly to the TSO as per Article 27 of DCC; and
 - HVDC systems as per HVDC.
- Providers of re-dispatching of PGMs or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of SOGL.

Timeline

- **19/12/18** – KORRR approved by All NRAs
- **25/01/19** – KORRR SGU Consultation launched in NI and IE
- **25/02/19** – KORRR SGU Consultation closing
- **14/03/19** – Agreement due with DSOs on processes and formats for data exchange

Stakeholder Engagement

- **SONI & EirGrid**
 - Telecoms
 - Access Planning
 - Network Planning
 - Innovation
 - Near Time Operations
 - SOGL SME
 - System Support
 - Real Time
- **ESB Networks**
 - KORRR WSL
- **NIE Networks**
 - KORRR WSL
- **National Grid ESO**
 - KORRR WSL
- **ENTSO-E**
 - KORRR Working Group
- **SGUs**
 - KORRR SGU Consultations

Current Status of Data Exchange

- Data exchange requirements under KORRR are largely complied with already
- Compliance due to Grid Code, Distribution Code and current processes
- Some gaps in data exchange exist e.g. type B PGMs
- KORRR SGU Consultation held to gather feedback on proposed solutions to close data exchange gaps

KORRR SGU Consultation

Proposals

Section Heading	Article	Changes to SGU Activities due to KORRR?
4.1.	KORRR Article 3(2)	No
4.2.	KORRR Article 3(3)	No
4.3.	KORRR Article 6(5)	Situation Dependent
4.4.	KORRR Article 7(2)	No
4.5.	KORRR Article 9(3)	No
4.6.	KORRR Article 9(4)	No
4.7.	KORRR Article 10(2)	No
4.8.	KORRR Article 10(5)	No
4.9.	KORRR Article 11(2)	No
4.10.	KORRR Article 14(1)	No
4.11.	KORRR Article 14(2)	No
4.12.	KORRR Article 15(1)	Yes
4.13.	KORRR Article 16(1)	Yes
4.14.	KORRR Article 16(2)	Yes
4.15.	KORRR Article 17(1)	Situation Dependent
4.16.	KORRR Article 17(2)	Situation Dependent

4.4 KORRR Article 7(2)

Requirement

"Each TSO shall specify the format and may publish templates for the structural data that transmission connected SGUs and distribution connected SGUs that exchange data directly with the TSO shall provide, in line with Article 40(7) of the SO GL. The agreement between each TSO and the relevant DSOs referred to in Article 40(7) of the SO GL shall only be required for the involved DSOs. The format or template has to include the detailed content of the structural data that have to be provided."

KORRR Article 7(2)

Proposal

SGUs providing structural data directly to the TSO shall provide it in compliance with the applicable Distribution Code or Grid Code, unless otherwise agreed.

Justification

Structural data requirements for SGUs in KORRR are captured in the Distribution Code and Grid Code. This data is gathered during the connection offer process. The existing format in the Distribution Code or Grid Code will be used.

In consideration of Article 1(5) of KORRR, the highest overall efficiency and lowest total cost will be achieved for new and existing SGUs by following data transfer requirements of the applicable Distribution Code or Grid Code, and those requirements documented between an SGU and SO e.g. Connection Agreement, Derogations.

4.4 KORRR Article 7(2)

Ireland

Grid Code

- Requirement met under Planning Code section

Distribution Code

- Requirement met under Distribution Planning Code section

Northern Ireland

Grid Code

- Requirement met under Planning Code section

Distribution Code

- Requirement met under Planning Code section

4.3 KORRR Article 6(5)

Requirement

"Subject to approval of the competent regulatory authority or approval of the entity designated by the Member State in accordance with Article 40(5) of the SO GL, each TSO, in coordination with the DSOs and SGUs, shall define which SGUs in its control area shall provide the real-time data."

KORRR Article 6(5)

Proposal

All SGUs connected to the Transmission System shall provide real-time data as per Grid Code and current TSO processes.

Power generating modules connected to the Distribution System shall provide real-time data as per Table 2.

Table 2: Real-time data exchange requirements for power generating modules connected to the Distribution System

Power generating module	Requirement
RTU or other means as specified by the RSO, is in place to give effect to provision of real-time data.	Provide real-time data as per the applicable Distribution Code or Grid Code, to the RSO, unless otherwise agreed.
No RTU or other means as specified by the RSO, is in place to give effect to provision of real-time data.	Provide data to the connected SO to enable a real-time approximation model, unless otherwise agreed.

4.12 KORRR Article 15(1)

Requirement

“Each SGU shall review the structural information it shares with the DSOs or TSOs of the control area the SGU belongs to, at least every 6 months. Each SGU shall provide updated information to the TSO and/or DSO as defined at a national level or, if it’s not defined at a national level, in the following situations, however in both cases not less than 3 months before:

- a. the planned commissioning of a new network element or SGU;*
- b. the planned final removal from service of the network element or SGU; and*
- c. the planned significant modifications in the network element or SGU.*

Moreover, each SGU shall provide updated information as soon as an error in the data set transmitted earlier is detected and in case of an unforeseeable modification, the SGU shall inform the TSO without delay.”

KORRR Article 15(1)

Proposal

SGUs shall provide updated structural information to the TSO or DSO to which they are connected 3 months before:

- a. the planned commissioning of a new SGU;
- b. the planned final removal from service of an SGU; and
- c. the planned significant modifications in an SGU.

Updated structural information will not be required from SGUs every 6 months.

4.13 KORRR Article 16(1)

Requirement

"All SGUs within the control area of the TSO shall provide scheduled data to the TSO. Transmission connected SGUs shall provide data directly to the TSO. Distribution connected SGUs shall provide data directly to the TSO or through its connecting DSO or to both, as defined in Article 3(3) of KORRR."

KORRR Article 16(1)

Proposal

SGUs connected to the transmission system or providing services to the TSO shall provide scheduled data to the TSO directly in compliance with Grid Code, unless otherwise agreed.

SGUs connected to the distribution system shall provide scheduled data to both the TSO and DSO where an outage results in the loss of 5 MW of generation or greater, unless otherwise agreed.

The TSO and DSO shall exchange between them the data related to an SGU upon request by a System Operator (SO), to comply with the requirements of the SO GL provisions.

4.14 KORRR Article 16(2)

Requirement

“SGUs shall comply with the requirements defined by the relevant TSO, and/or by the DSO when the SGU is required to provide data through the DSO according to Article 3(3) of KORRR, to exchange scheduled data. The frequency of delivery of scheduled data shall be defined at a national level.”

KORRR Article 16(2)

Proposal

SGUs connected to the transmission system or providing services to the TSO shall provide scheduled data to the TSO directly in compliance with Grid Code, unless otherwise agreed.

SGUs connected to the distribution system shall provide scheduled data to both the TSO and DSO where an outage results in the loss of 5 MW of generation or greater, unless otherwise agreed. This shall be provided at least 3 weeks in advance of real-time, and as the information is available.

The TSO and DSO shall exchange between them the data related to an SGU upon request by a System Operator (SO), to comply with the requirements of the SO GL provisions.

4.15 KORRR Article 17(1)

Northern Ireland

Requirement

"Subject to Article 6(5) of KORRR, all concerned SGUs connected to the transmission system shall provide the real-time data directly to the TSO. Subject to Article 6(5) of KORRR, all concerned distribution connected SGUs shall provide the real-time data to the TSO directly or through its connecting DSO or to both, as defined in Article 3(3). All SGUs which are power generating modules not subject to the NC RfG, or which are HVDC systems not subject to the NC HVDC, or which are demand facilities not subject to the NC DCC, shall inform to the TSO about their technical capabilities for real-time data provision. The evaluation process to exempt particular SGUs, in case of non-compliance with the requirement to provide real-time data, shall be defined at a national level."

KORRR Article 17(1)

Proposal

SGUs connected to the transmission system or providing services to the TSO shall provide real-time data directly to the TSO.

SGUs connected to the distribution system shall provide real-time data directly to the DSO, unless otherwise agreed.

SGUs which are power generating modules not subject to the NC RfG, or which are HVDC systems not subject to the NC HVDC, or which are demand facilities not subject to the NC DCC, will be assumed to be compliant with Article 6(5) of KORRR unless the RSO is notified.

The evaluation process to exempt particular SGUs, in case of non-compliance with the requirement to provide real-time data, will be on a case-by-case basis.

Ireland

Requirement

"Subject to Article 6(5) of KORRR, all concerned SGUs connected to the transmission system shall provide the real-time data directly to the TSO. Subject to Article 6(5) of KORRR, all concerned distribution connected SGUs shall provide the real-time data to the TSO directly or through its connecting DSO or to both, as defined in Article 3(3). All SGUs which are power generating modules not subject to the NC RfG, or which are HVDC systems not subject to the NC HVDC, or which are demand facilities not subject to the NC DCC, shall inform to the TSO about their technical capabilities for real-time data provision. The evaluation process to exempt particular SGUs, in case of non-compliance with the requirement to provide real-time data, shall be defined at a national level."

KORRR Article 17(1)

Proposal

SGUs connected to the transmission system or providing services to the TSO shall provide real-time data directly to the TSO.

SGUs connected to the distribution system shall provide real-time data directly to the DSO, unless otherwise agreed.

SGUs which are power generating modules not subject to the NC RfG, or which are HVDC systems not subject to the NC HVDC, or which are demand facilities not subject to the NC DCC, shall notify the TSO and the DSO if they are non-compliant with Article 17(1) of KORRR. The evaluation process to exempt particular SGUs, in case of non-compliance with the requirement to provide real-time data, will be on a case-by-case basis. The evaluation process will be defined at a later date.

4.16 KORRR Article 17(2)

Requirement

“Each SGU providing data directly to the TSO or the DSO when the data is directly provided to the DSO shall fulfil the requirements defined by the TSO in terms of:

- a. logical connections between parties and protocols used;*
- b. network architecture including redundancy;*
- c. network security rules;*
- d. identification code (ID) and/or naming convention and data quality;*
- e. data transmission parameters and performance;*
- f. rules of conduct in the case of planned outages and disturbances of communication equipment.”*

KORRR Article 17(2)

Proposal

SGUs shall fulfil their requirements for real-time data exchange as defined in the proposals of this consultation and in line with the Grid Code and Distribution Code and existing processes as relevant..

KORRR SGU Consultation

KORRR SGU Consultation Northern Ireland

- Responses should be submitted to SONI at gridcode@soni.ltd.uk before 5pm on **25th February 2019**, with the subject title “KORRR SGU Consultation Northern Ireland”.
- If you require any further information please email SONI at gridcode@soni.ltd.uk.
- Consultation link: http://www.soni.ltd.uk/customer-and-industry/european-integration/integration/index.xml?_toolbar=1#comp_00005bd16a3e_0000001d23_7017

KORRR SGU Consultation Ireland

- Responses should be submitted to EirGrid at gridcode@eirgrid.com before 5pm on **25th February 2019**, with the subject title “KORRR SGU Consultation Ireland”.
- If you require any further information please email EirGrid at gridcode@eirgrid.com or ESB Networks at DistCodePanel@esb.ie.
- Consultation link: <http://www.eirgridgroup.com/customer-and-industry/european-integration/integration/>

Next Steps

- Gather feedback from today's AIF
- Assess SGU consultation responses
- Incorporate necessary changes for the TSO-DSO Agreements
- Publish a position paper online for SGU requirements under KORRR



Thank you! Any questions?