

NETWORK CODES Implementation Monitoring

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EnC SG SoS, 2 July 2019

Network Codes and Guidelines: Intended benefits



SECURE OPERATIONS WITH REGIONAL COOPERATION

Regional Security Coordinators:

1. Capacity calculation
2. Security analysis
3. Common grid model
4. Adequacy forecast
5. Outage planning

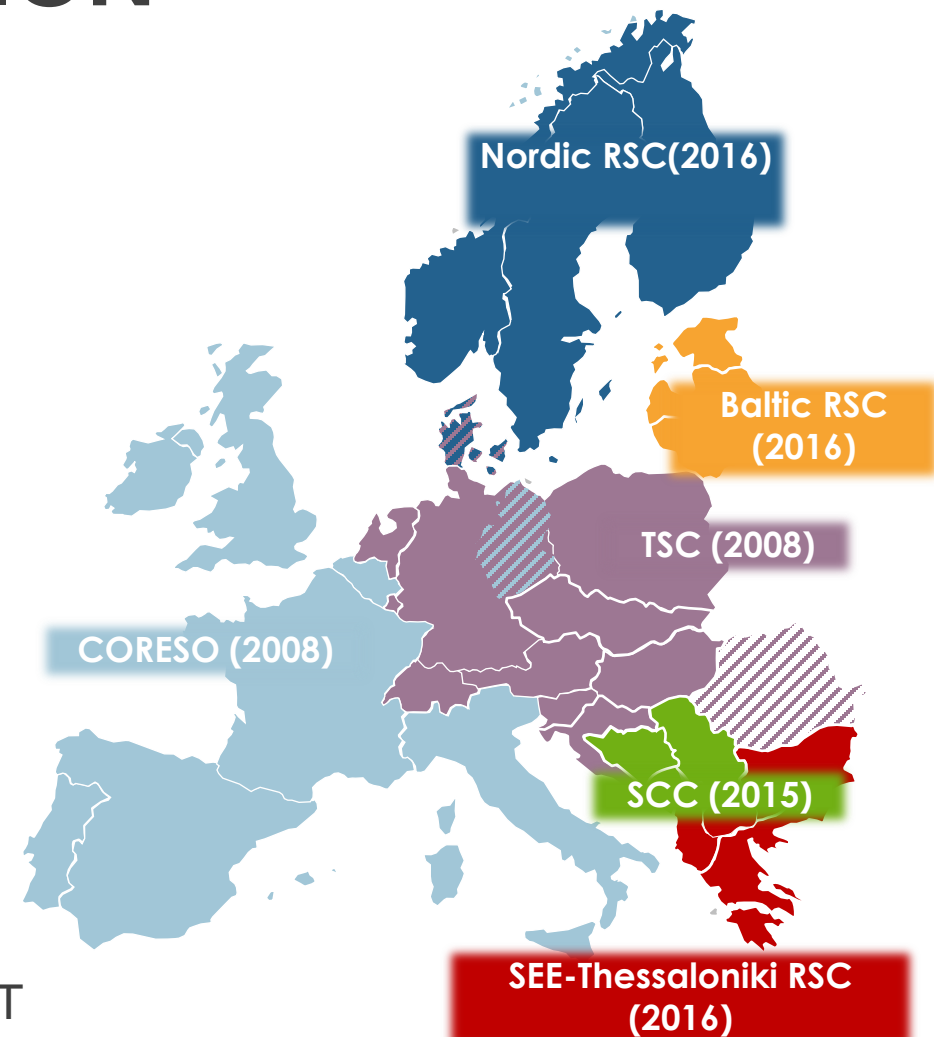
*partially operational
in TSCNET and
CORESO*

➔ Discovered 7 times more potentially critical situations CORESO in 2015 compared to 2014

➔ Mitigate critical grid situations

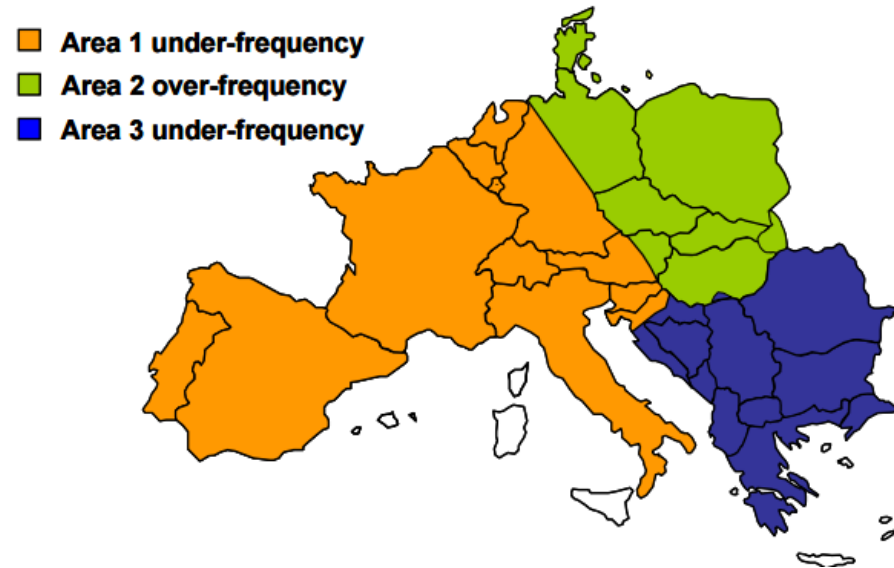
4000 remedial actions proposed/year in CORESO

130 multilateral remedial actions coordinated by TSCNET



AVOID DISTURBANCE – “THE 2006-CASE”

UCTE area split into three areas 4 Nov 2006 22:10



- **15 million households** had a load shed
- **17 GW** of load shedding
- **300-500 M€** of economic losses due to load shedding
- **> 20 GW** of generation tripped or disconnected

Network codes improve coordination and data exchange - and streamline emergency procedures

IMPLEMENTATION TASKS: OPERATION CODES



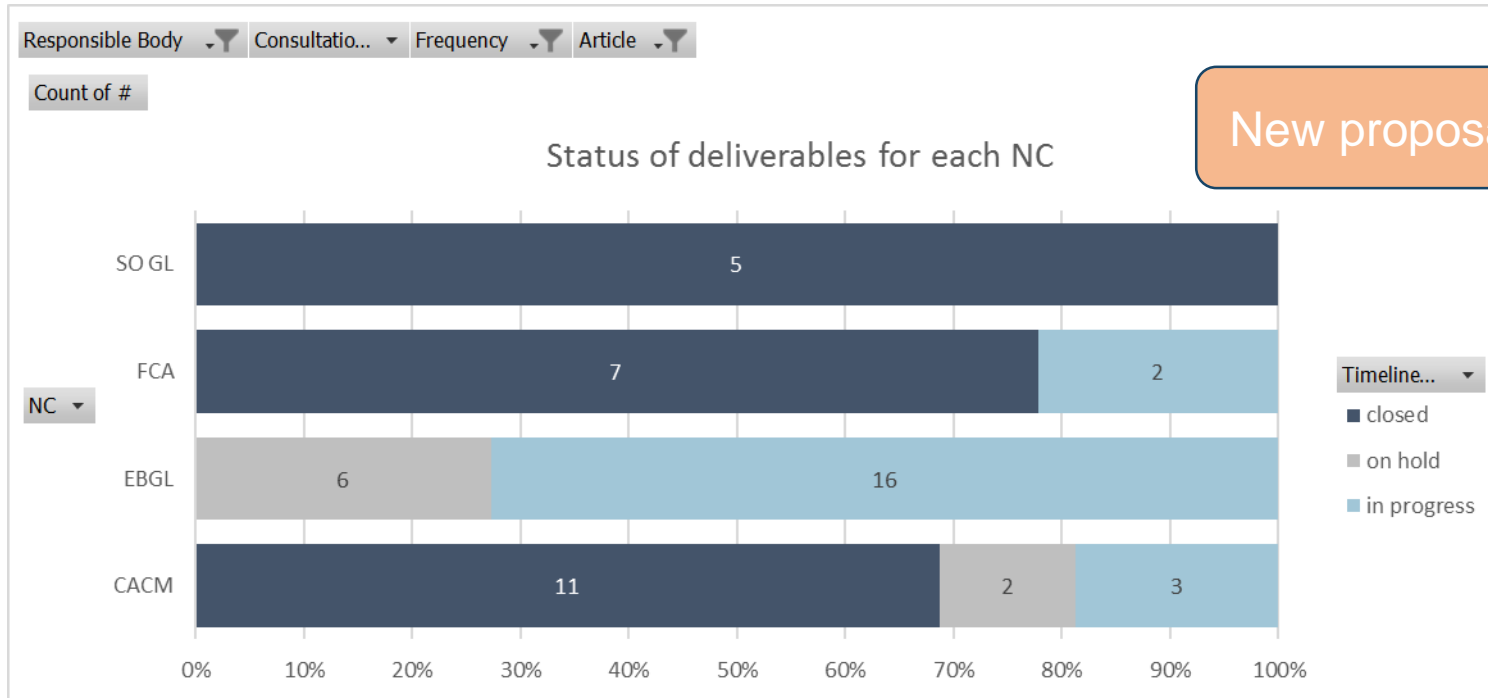
→ Several tasks involving ENTSO-E, all TSOs, regions (*)

(*) regions : synchronous area (SA), outage coordination region (OCR), capacity calculation region (CCR)

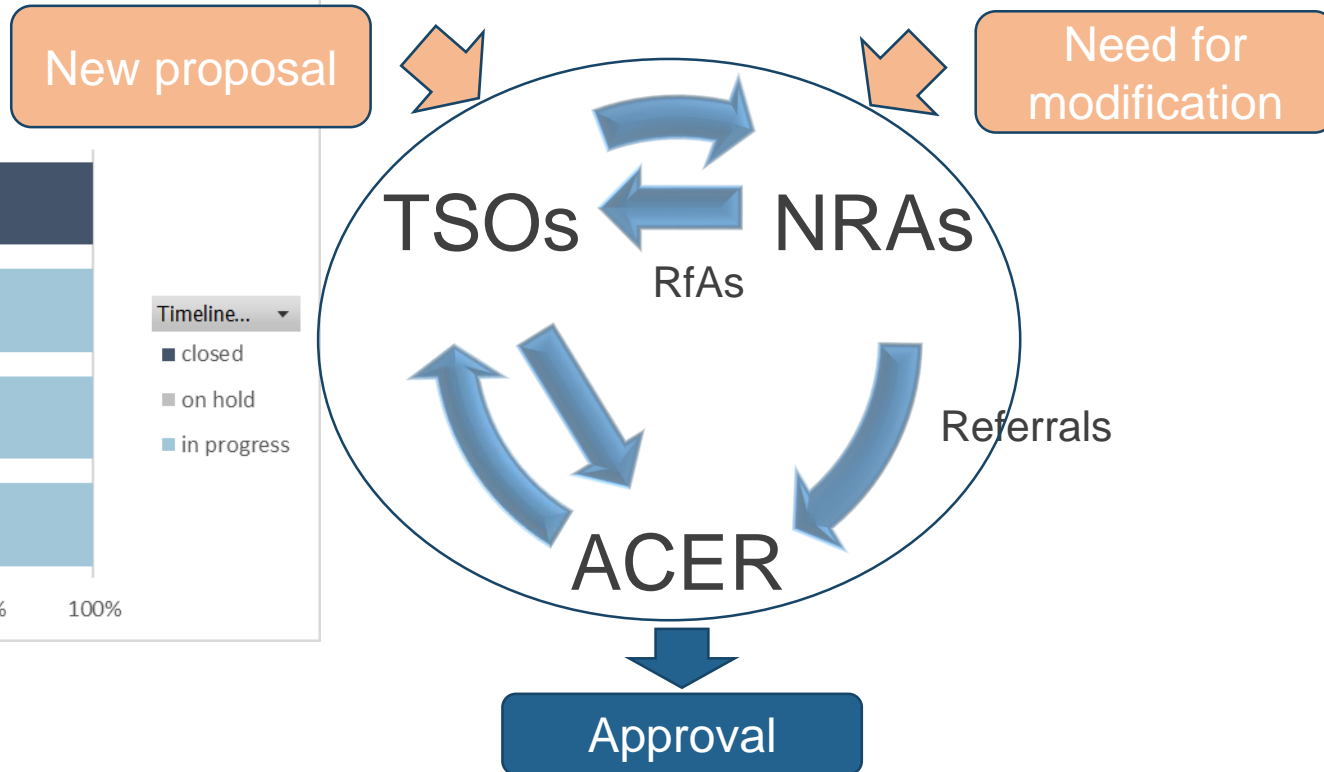
System Operation Guidelines	
Data Exchange	2017
Common Grid Model: methods, data	2018-2019
Coordinated operational security analysis	2019
Operational planning data environment	2019
Regional Security Coordinators	2019
Synchronous area operational agreements	2019

Emergency & Restoration	
Regionally coordinated system defence and system restoration plans	2019
Coordinated automatic over-frequency control	2019

Status on implementation of Network Codes

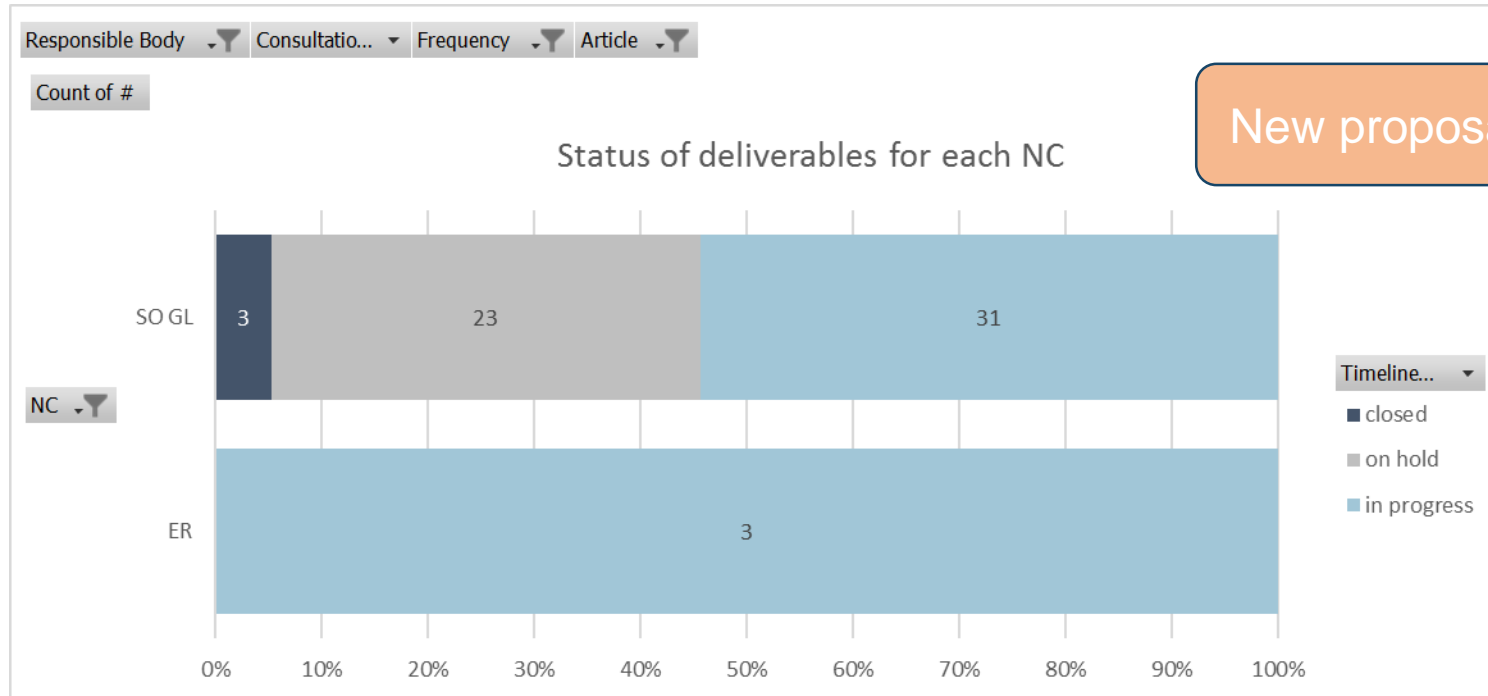


All TSO, one-time deliverables

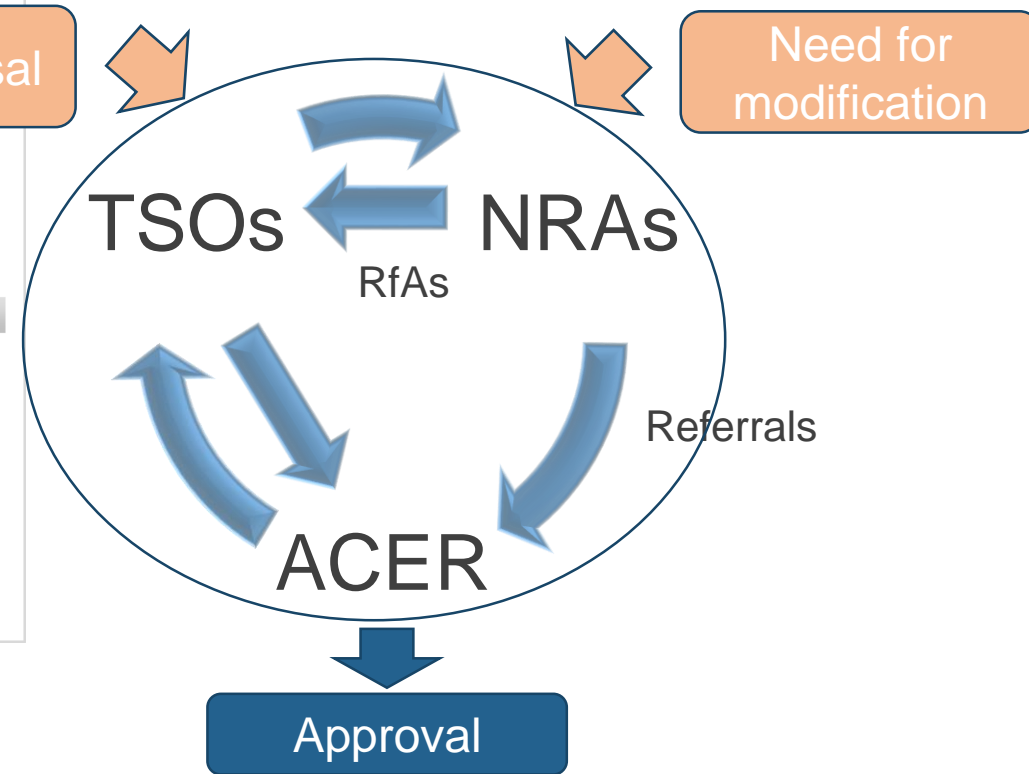


- Implementation still requires a lot of resources
- Amendments will require further resources from all stakeholders
- Decisions on new Network codes to be taken wisely considering limitation on resources

Status on implementation of Network Codes



Regional (SA, CCR, etc.), one-time deliverables



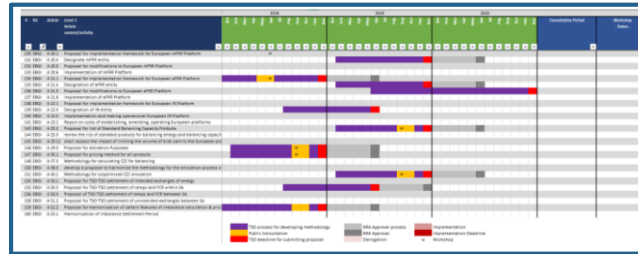
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Region / SA	SPOC	SAOA Status
Nordic	Erik Bruun (Statnett)	<ul style="list-style-type: none"> • LFCR methodologies that have been sent to NRAs by 14 September 2018 were approved by the Nordic NRAs on 14 March except for the FRR/RR exchange/sharing between SA (SOGL 176-179): amended proposal submitted 14 May. • TSOs are working on the methodologies that do not require NRA approval. • Approval of main agreement and annexes planned for mid of August 2019.
Great Britain	David Bunney (NG ESO)	<ul style="list-style-type: none"> • Public consultation on methodologies completed 26/08/2018 • Methodologies submitted to Ofgem in September 2018 • On 14 March, Ofgem [approved contents but rejected the form, and] asked the technical texts to be in national regulation and produce a mapping document linking SOGL 118 and 119 requirements to articles in GB regulations. Completed 14/5 after consultation.
Ireland and Northern Ireland	<i>(ad interim)</i> Emma Fagan (Eirgrid)	<ul style="list-style-type: none"> • Public consultation completed 8/11/2018: no industry response but significant NRA comments. First submission to NRAs on 21/12/2018. • Workshop held with both NRAs 13th March 2019. Request for amendment from NRAs expected 21 June 2019 and NRAs have indicated that they will request another round of public consultation on the revised version arising. • SAOA expected to be concluded Nov'19 and enter into force Jan'20.
Continental Europe	Andreas Walczuch (Amprion)	<ul style="list-style-type: none"> • All methodologies submitted by <u>2 October 2018</u> and approved by NRAs <ul style="list-style-type: none"> • Except: FCR additional properties sent to NRAs by 22 March 2019 (SOGL Art. 154(2)) • SAFA approved 27/02/2019 and Entry into force 14/04/2019 (termination MLA OH) • Ongoing work on implementation: <ul style="list-style-type: none"> • SAFA project team turned into permanent advisory team to RG CE • Decision by end 2019: Sub-Group creation for compliance monitoring

• 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			
FULL TITLE	Develop a proposal for Terms and conditions to act as defence contractual basis			
RESPONSIBLE	Each TSO			
CLUSTER	Activities on national level - subject to public consultation			
GEOGRAPHICAL SCOPE	National			
<table border="1"> <tr> <td>TSOs Draft Proposal For Consultation 1/10/2018</td> <td>TSOs final submission 18/12/2018</td> <td>NRA approval deadline 18/06/2019</td> </tr> </table>		TSOs Draft Proposal For Consultation 1/10/2018	TSOs final submission 18/12/2018	NRA approval deadline 18/06/2019
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A 36.1 Develop a proposal for rules for suspension and...	CEPS			
A 39.1 Develop a proposal for rules for imbalance settlement	CEPS			



Description

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

Download the E Codes app



Access all codes

Track implementation deliverables

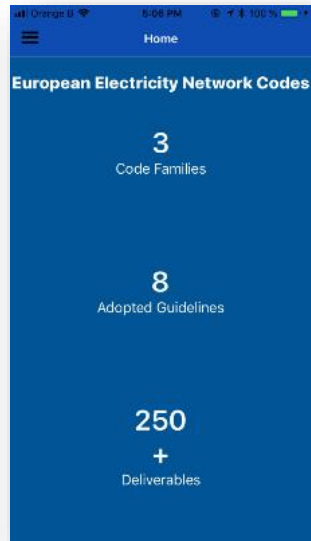
Codes-related public consultations, events and news



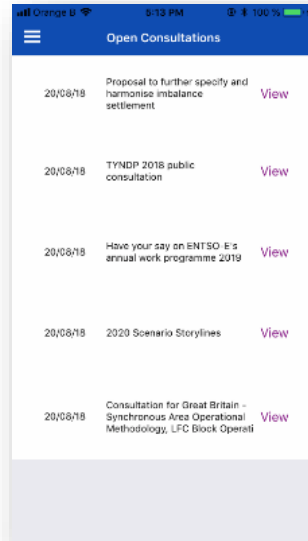


E-codes: App

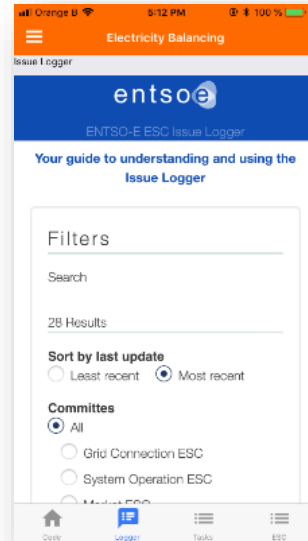
And all this information available in your pocket? **E-Codes App**



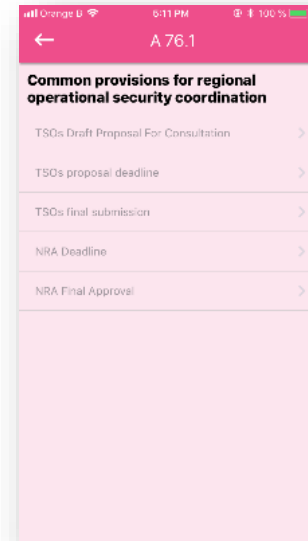
Consultations



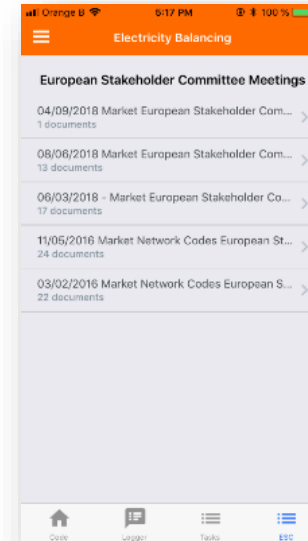
Events



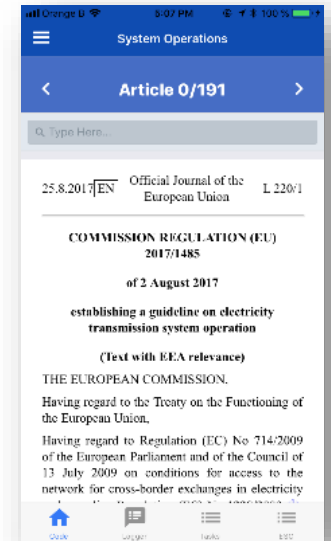
Network codes



Status of deliverables



Issue log



And way more

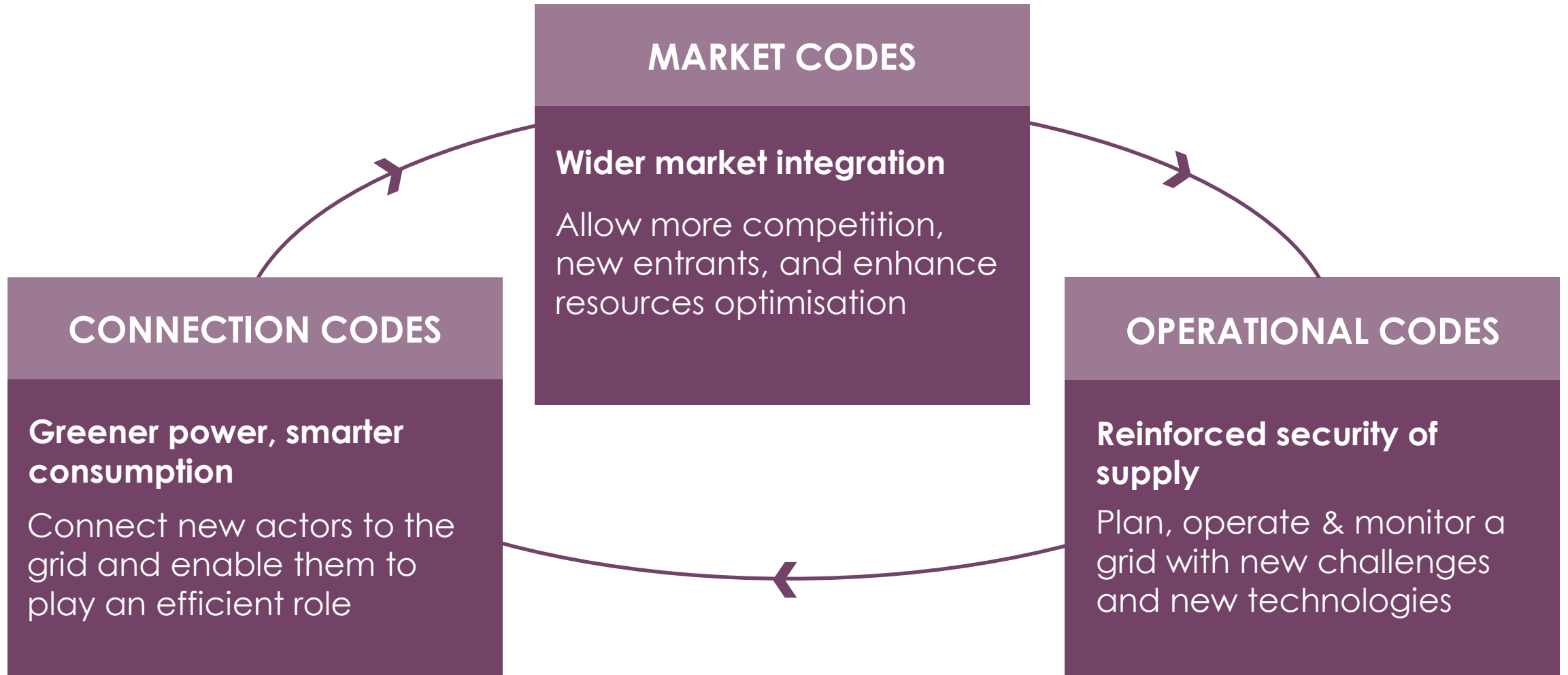
We recorded 900 downloads since the launch in September 2018
App is available for iOS and Android in [apple store](#) and [google play](#)

Backup slides

WHAT IS A NETWORK CODE/GUIDELINE?

- 1** A set of rules applying to a cross-border or market integration issue in the electricity sector
- 2** Developed by the European Commission, ACER, ENTSO-E & market participants under Art. 8 of the Electricity Directive
- 3** Going through a EU law-making process called 'Comitology'
- 4** Which at the end make network codes and guidelines binding EU regulations to be implemented in all member states

STRIVING FOR EUROPEAN HARMONISATION OF OUR PROCESSES



NETWORK CODES/GUIDELINES: THE FOUNDATIONS OF THE INTERNAL ENERGY MARKET

3 CONNECTION CODES

Requirements for:

- Generators
- Demand side
- HVDC connections

...paving the way for
offshore wind...

3 MARKET CODES

Rules for:

- Capacity calculation
- Day ahead / Intraday
- Forwards
- Balancing

...market coupling...

2 OPERATIONAL CODES

Rules for:

- System Operation
- Emergency situations

...regional cooperation
to increase security...

NETWORK CODES FACILITATE EU POLICIES



Sustainability

- **260 GW** of RES connected
- **25 GW** in 2016
- **>10 GW** of EU demand side response

Network codes



Competitiveness & Social Welfare

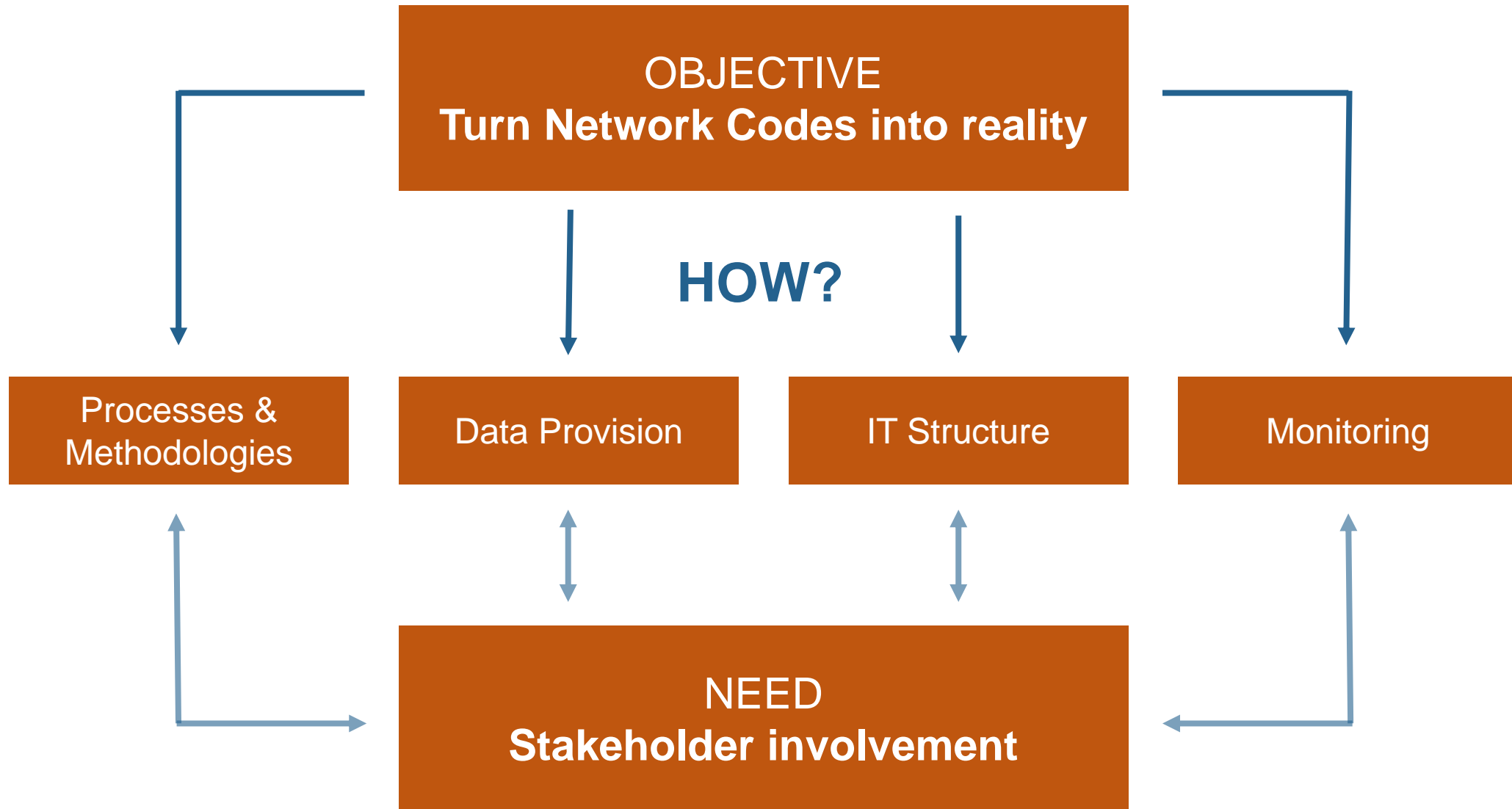
- **23 states** and **85%** of European consumption market coupled
- **10 million** data files made available yearly for **2500** daily users of ENTSO-E transparency platform



Security of supply

- **NO** multi-state interruptions recent years
- **Up to 300** coordinated tasks/day in a RSC
- **Hundreds** trained employees in RSCs programs and offices

AND NOW?



STAKEHOLDER COMMITTEES



- One stakeholder committee per family of codes.
- Grid connection and market already in place.
- ACER chairs.
- ENTSO-E in charge of secretariat.
- All information publically available on entsoe.eu

WHICH ROLE FOR TSOs?

DIFFERENT LEVELS OF RESPONSIBILITIES AND HARMONISATION

Task	Responsibility	Approval
ENTSO-E	ENTSO-E	ACER
Pan-European “All TSOs”	EU TSOs	All NRAs
Regional “All TSOs”	TSOs of the regions	NRAs of the region
National	Depending on national legislation (TSO, DSO, ...)	National NRAs

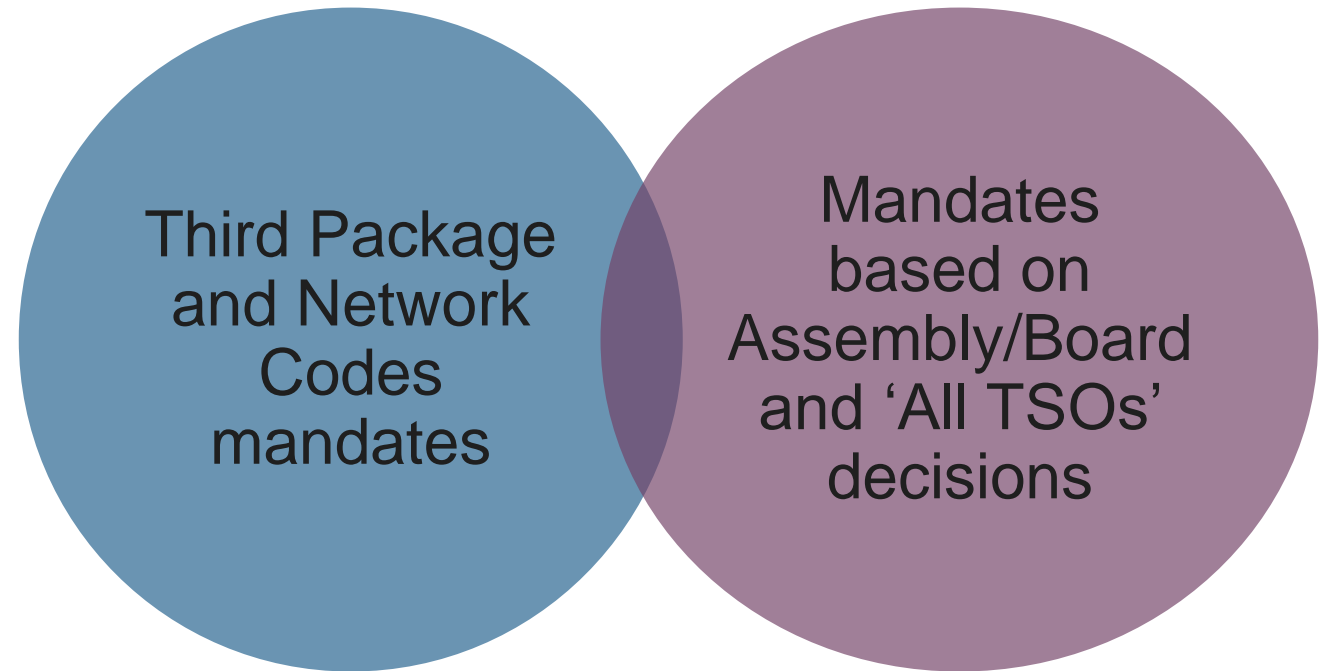
Stakeholders involvement, from European and regional groups, until national bodies

Monitoring by
ACER, EC, ENTSO-E

“All TSOs” PROCESS: WHICH ROLE FOR ENTSO-E?

→ Responsibility on the TSOs

- Facilitation of “all TSOs” tasks
 - Established for pan-EU tasks
 - Can be applied for regional tasks
- Specific rules apply
 - ToRs approved by the TSOs
- Use of ENTSO-E as platform
 - Gather TSOs, Secretariat support
- Inter-operability, stakeholders engagement and communication



ESSENTIAL EUROPEAN MILESTONES

Intraday coupling
go-live
Q1/2018

RSCs implemented
12/2019 and
Synchronous Area
Operational
Agreement
03/2019

All connection
codes
implemented
09/2019

Common platform for
balancing implemented
Q3/2019

Day-ahead market
coupling fully
implemented
12/2020

And more
to come...

Integrate wholesale
and retail markets

Realize demand
side response

DSO-TSO
cooperation

Cybersecurity

CASE STUDIES

CASE #1: PROMOTE WHOLESALE MARKETS

DAY-AHEAD MARKETS

- **1 B€** in social welfare
- **~100 M€/year** of benefits from flow-based in CWE
- **84%** efficient use of capacity given to the market
- **1500 TWh** (~50% of consumption) traded on exchanges



INTRADAY MARKETS

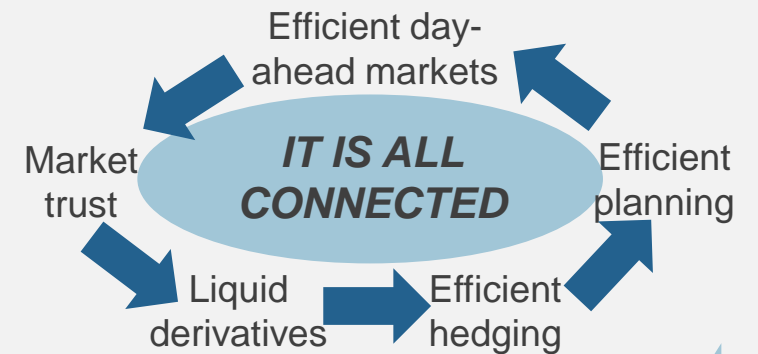
- **120 TWh** traded on main power exchanges in 2016
- **3,6%** average annual volume growth last 5 years

STATES WITH INTRADAY MARKETS

- ✓ **Continuous trading**
- ✓ **15 minutes auctions**



DERIVATIVES MARKETS



CASE #2: INTEGRATE BALANCING MARKETS (1)

Annual benefits:

~ 220 M€

Replacement reserves in the Nordics since 2003

~ 260 M€

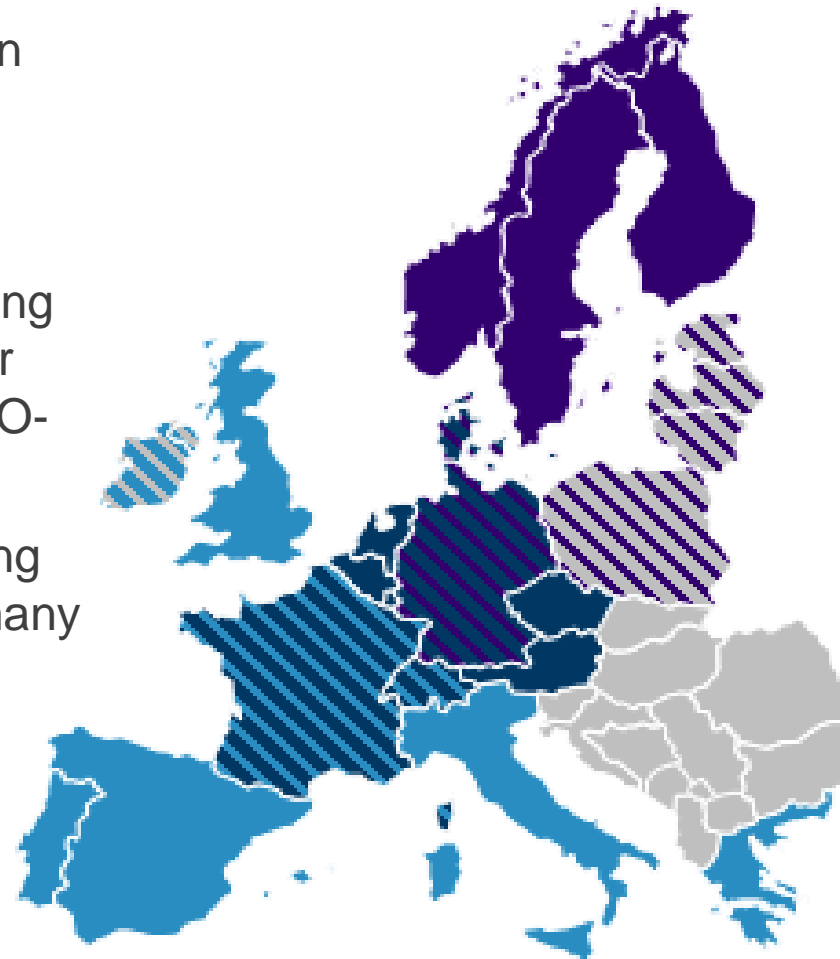
Common reserves, netting and common merit order implemented across TSO-areas in Germany

~ 80 M€

Pilot on imbalance netting within and around Germany (IGCC)

~ 120 M€

Pilot on replacement reserves across the Continent (TERRE)



Theoretical benefits of full integration of balancing markets

Up to 3 Bn€

CASE #2: INTEGRATE BALANCING MARKETS (2)

BALANCING MARKET MILESTONES



CASE #3: SECURE OPERATIONS WITH REGIONAL COOPERATION

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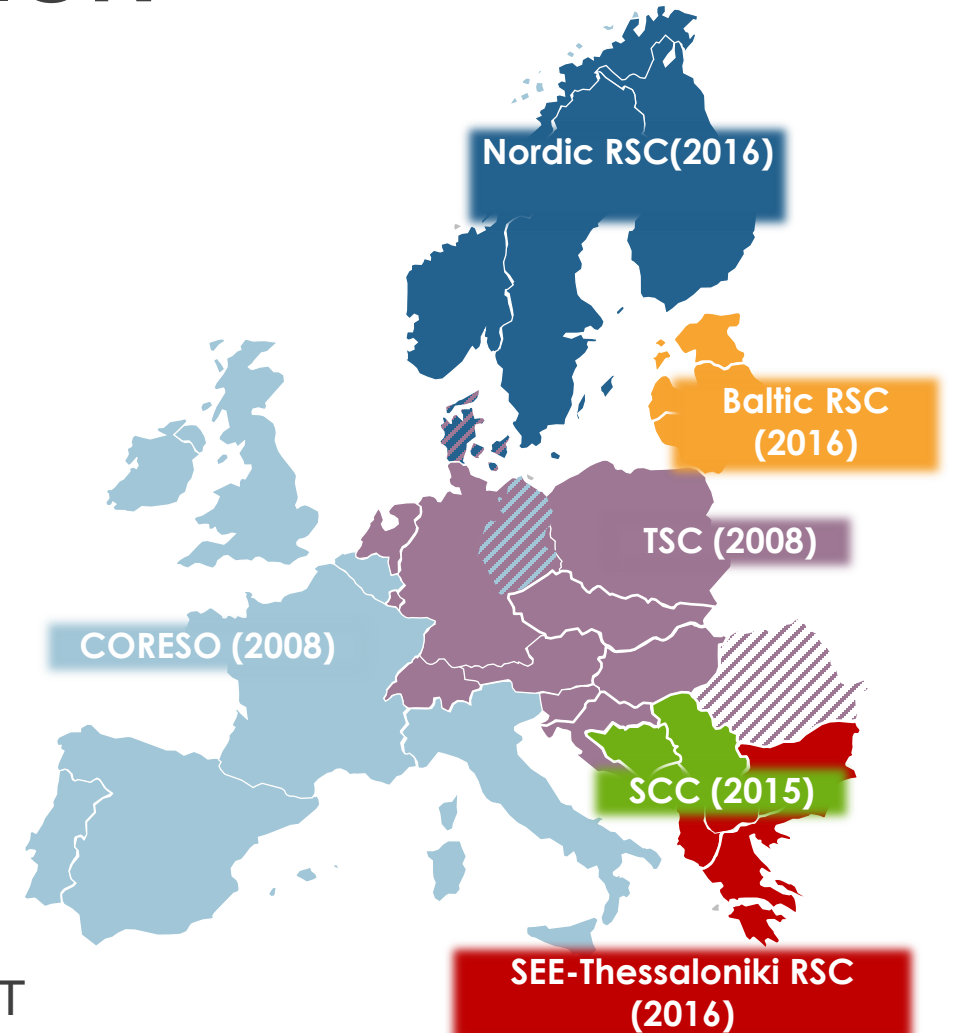
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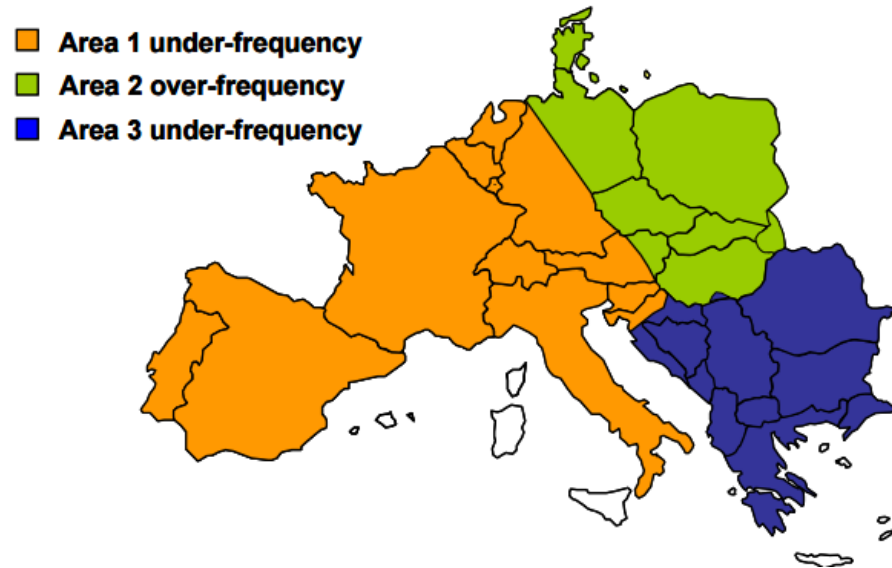
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THANK YOU FOR YOUR ATTENTION



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