



Workshop Smart Grid
Standardisation
May 16th 2013



Impact of the Network Codes

Session 1: DER integration and Grid control

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Agenda

Presentation of ENTSO-E

Network Codes process

Network Codes under development

Focus on Demand Connection Code - DCC

Conclusion



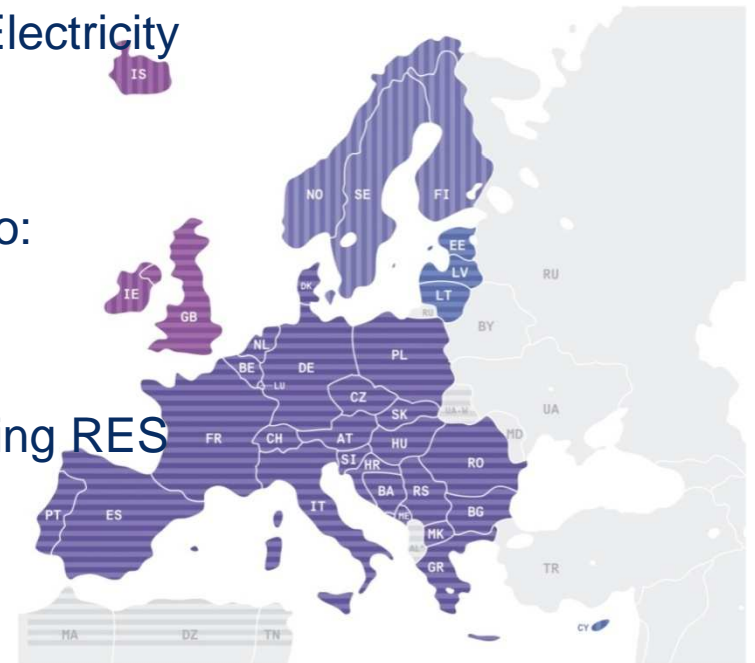
• **Key activities set out in Regulation 714/2009 (on cross-border electricity trade, part of the 3rd Internal Energy Market Package)**

- Deliver **network codes**
- Deliver **network plans** European / regional view of system needs (“TYNDP”)
- Deliver crucial aspects of **market integration** (“market coupling”)
- **R&D Plan** (fully included in EEGI – European Electricity Grid Initiative, part of the SET Plan)

• Through its members deliver the **infrastructure** to:

- enable markets to function,
- secure energy supply,
- meet climate change objectives through connecting RES

- Represents **41 members from 34 countries**



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What is a network code?

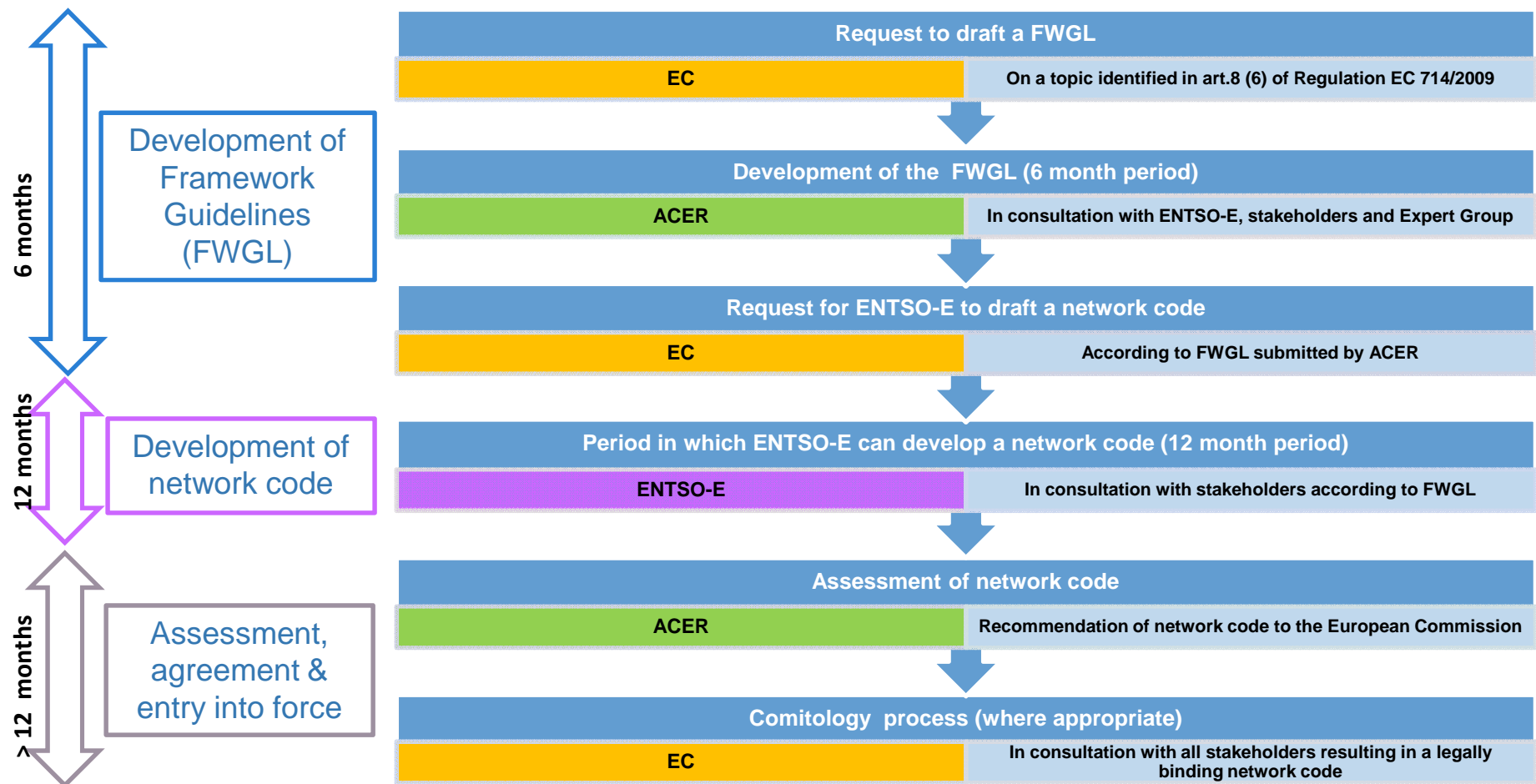
A set of rules applying to one aspect of the energy sector

Which are developed by ACER, ENTSO-E & market participants

And become legally binding after the Comitology process

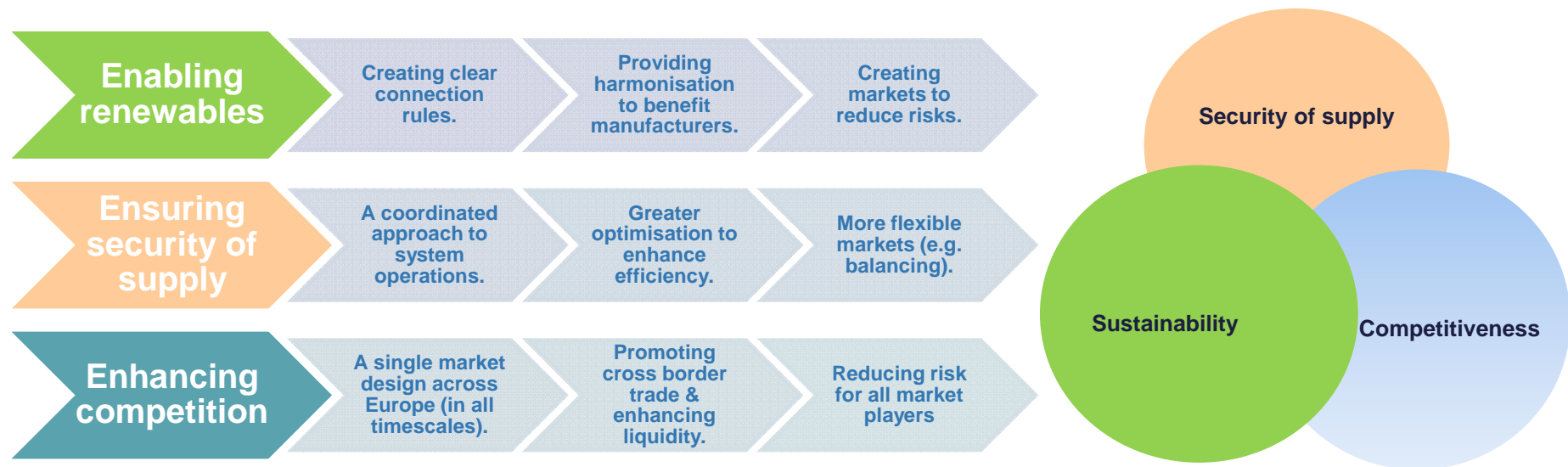
Hence they will have the same status as any other Regulation

How are network codes developed?



... through a collaborative process

Intended benefits



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Overview of current & future network codes

Grid Connection Related Codes

- Requirements for Generators (RfG)
- Demand Connection Code (DCC)
- HVDC Connection Code (HVDC)
- Connection Procedures (CP)

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System Operation Related Codes

- Operational Security Network (OS)
- Operational Planning & Scheduling (OPS)
- Load Frequency Control & Reserves (LFCR)
- Operational Procedures in an Emergency (EP)

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Market Related Codes

- Capacity Allocation & Congestion Management (CACM)
- Forward Capacity Allocation (FCA)
- Balancing Network Code (EB)

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 $\Sigma = 15$

Order of work

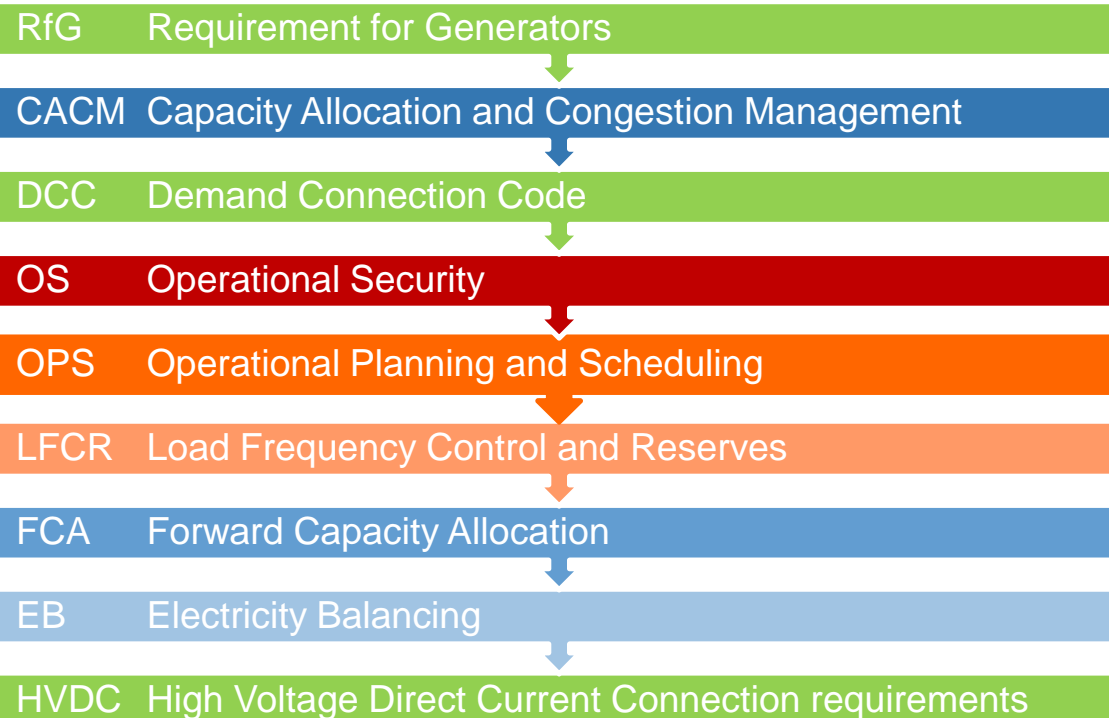
Decided by the EC

Through a 'Priority List' agreed upon through consultation

Influenced by and informs

ENTSO-E's Three- Year Work Plan

The current network codes are developed in this order



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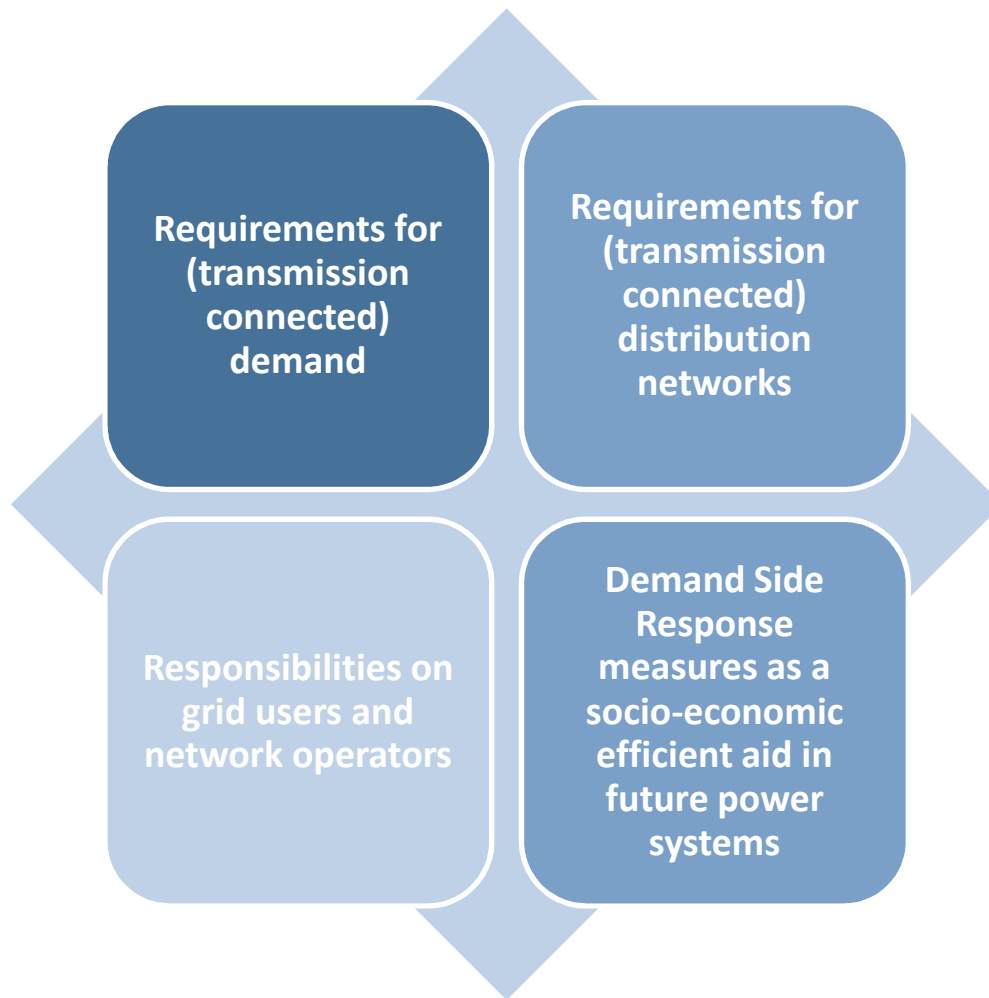
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Demand Connection Code



Limited number of non-exhaustive requirements for transmission connected demand

Functional capabilities for Demand Side Response measures

- To be further specified in detail and for specific appliances

Demand Connection Code - Demand Side Response

DCC Art 22/23 specifies a set of functional capabilities for Demand Side Response that could also be mandatorily fitted into appliances in the European market

DCC prescribes a process on how appliances are identified – including consultation open to e.g. standardization bodies and implementation in line with Ecodesign directive

More detailed technical specifications for product design needed

DCC requirements developed to not lock-in certain demand response solutions

Ongoing standardization in general demand response schemes (not only cross-border) can use DCC requirements as an enabler

Demand Connection Code - Demand Side Response

DSR for active/reactive power control and transmission constraint management

- If a user volunteers to provide this, the DCC prescribes basic functional capabilities (e.g. need for communication, time delay constraint, controllability)
- Procurement of the service: out of scope of this code, but can be captured in LFC&R or Balancing NC or other mkt mechanisms
- The code gives a process by which appliances could be mandatorily fitted with these capabilities to facilitate mkt uptake, in line with market based, consumer focused vision of smart grids
- Further technical specifications expected by standardization

DSR for system frequency control

- Mandatory capability for temperature controlled devices with inherent heat storage to react to frequency disturbances
- The code gives a process by which appliances could be addressed
- In the context of increased intermittent generation, and stronger needs for ancillary services, this offers a pragmatic, mature solution to partly address this change.

Demand Connection Code - Demand Side Response

The DCC defines **remotely** controlled **voluntary services** for :

- active power control,
- reactive power control,
- transmission constraint management,

**Market-based
incentives**

The DCC defines a **voluntary** but **autonomous operation** for:

- very fast active power control.

The DCC proposes a **mandatory service** for :

- temperature-controlled devices, reacting autonomously to the frequency (*air conditioners, water heaters or heat pumps with autonomous operation for system frequency control*).

↳ following Eco-design requirements.



Network Code on: Demand Connection

Code Overview

Purpose: To set requirements for new demand users and DSO connections and to outline demand side response requirements related to system frequency.

Status: An ACER opinion and recommendation to adopt the code was made on 27 March 2013.

Contents:

- Requirements
- Operational Notification Procedure
- Compliance
- Derogations

Links to other codes/areas

- **RfG/ HVDC** – Balance between demand and generation requirements and coherence in processes.
- **LFCR** – Impact of DSR SFC on system reserve calculations.
- **OS** – Technical requirements to strengthen coordination and enhance system security.
- **EB** – Demand Response will be an ever more needed building block in balancing products.
- **Ecodesign/labelling Directive** – Vehicle to develop DSR requirements.
- **Cenelec M490** – Work on-going to develop DSR standards.



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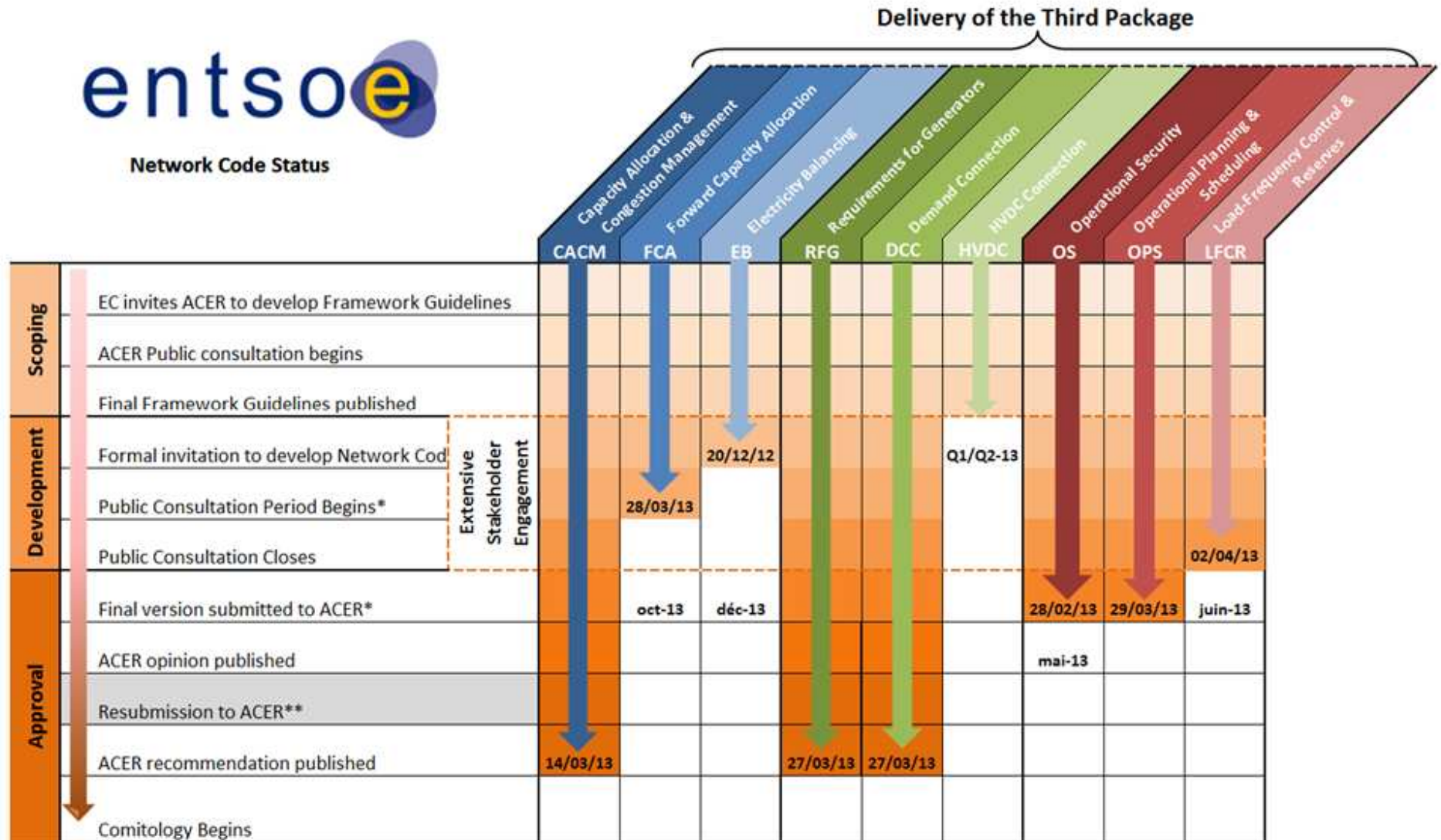
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Network codes on electricity under development



Network Code Status



Network Codes – Key messages

- Development of a wide set of network codes is ongoing with the aim of becoming **binding European Regulation** in the coming years
- Network codes are urgent tools to **ensure systems security** and European market integration in a rapidly changing power system.
- The process of network code development counts on **input from the wider industry** and welcomes the contribution of standardization bodies to take up this role.
- Standards can **complement** network codes in various areas, e.g. compliance, non cross border issues, harmonization for cost efficiencies.
- **Coordination** between network codes and standardization activities is key to ensure both tools reach their objective.



Thank you for your attention

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www.entsoe.eu