Network Code on Demand Connection

CENELEC (Mandate 490)

05 December 2011, Brussels

entsoe

Reliable Sustainable Connected

Topics

- Meeting objective
- ENTSO-E Network Code Development
- Demand Connection Code scope
- Principles of specific topics
- Timeline / next steps

Meeting objective

Meeting objectives

- **Inform of network code development process & timeline**
- **Discuss initial scope of network code and receive feedback**
- **Note CENELEC's perspective on a European network code on demand connection**

ENTSO-E Network Code Development

ENTSO-E has significant role in delivering European energy and climate change objectives

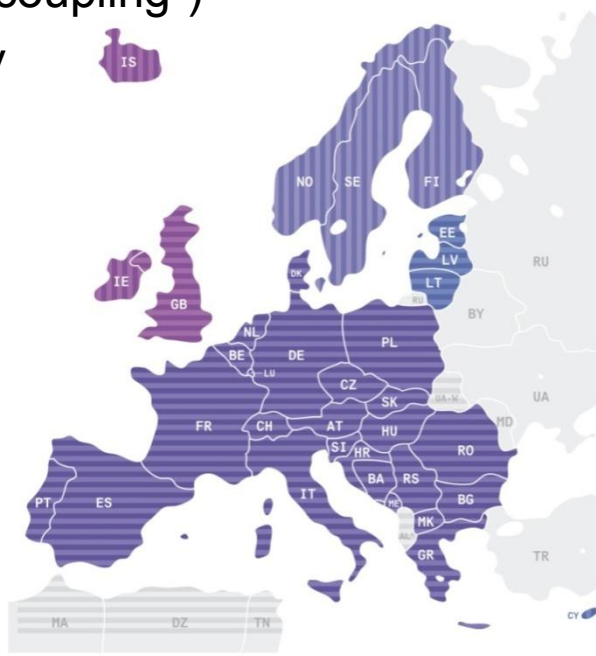
Key activities set out in Regulation 714/2009 (on cross-border electricity trade, part of the 3rd Internal Energy Market Package)

- 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)

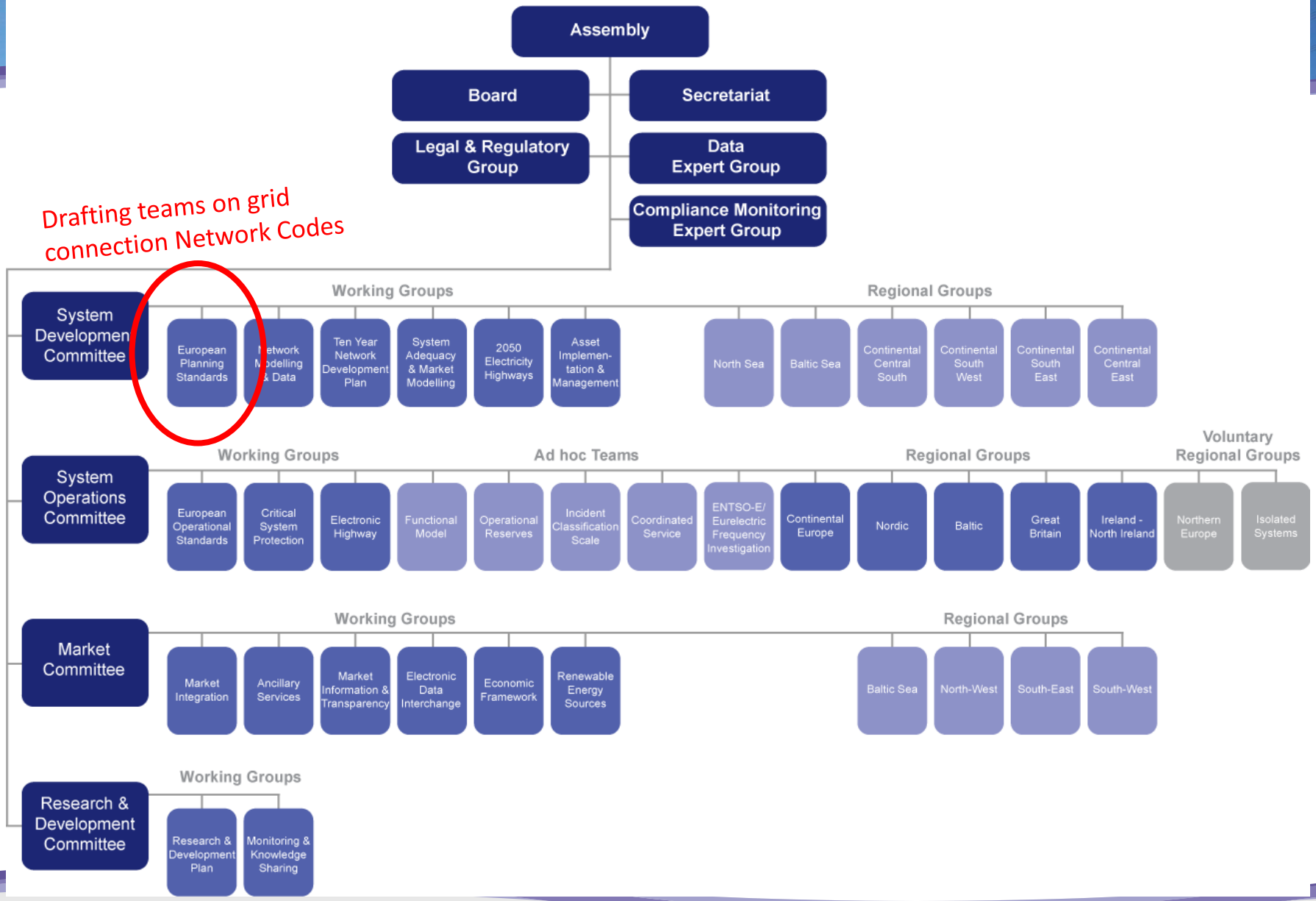
Through its members deliver the **infrastructure** to:

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

Represents **41 members from 34 countries**



ENTSO-E organizational structure



Why European Network Codes?

The development of *European wide Network Codes* in various domains by

- bringing together the expertise of diverse stakeholders
- in an open and transparent process
- creating a coherent approach on common issues

is a crucial enabler of *Europe's Energy goals* in

- increasing the amount of renewables
- guaranteeing an adequate Security of Supply
- contributing to an Internal Energy Market

Article 8 – Tasks of ENTSO-E

6. "The network codes … cover the following areas, taking into account, if appropriate, regional specificities:"

Draft framework guideline

a. network security and reliability rules incl. rules for technical transmission reserve capacity for operational network security;

Final framework guideline

b. network connection rules;

c. third-party access rules;

d. data exchange and settlement rules;

e. interoperability rules;

Draft framework guideline

f. operational procedures in an emergency;

Final framework guideline

g. capacity-allocation and congestion-management rules;

h. rules for trading related to technical and operational provision of network access services and system balancing;

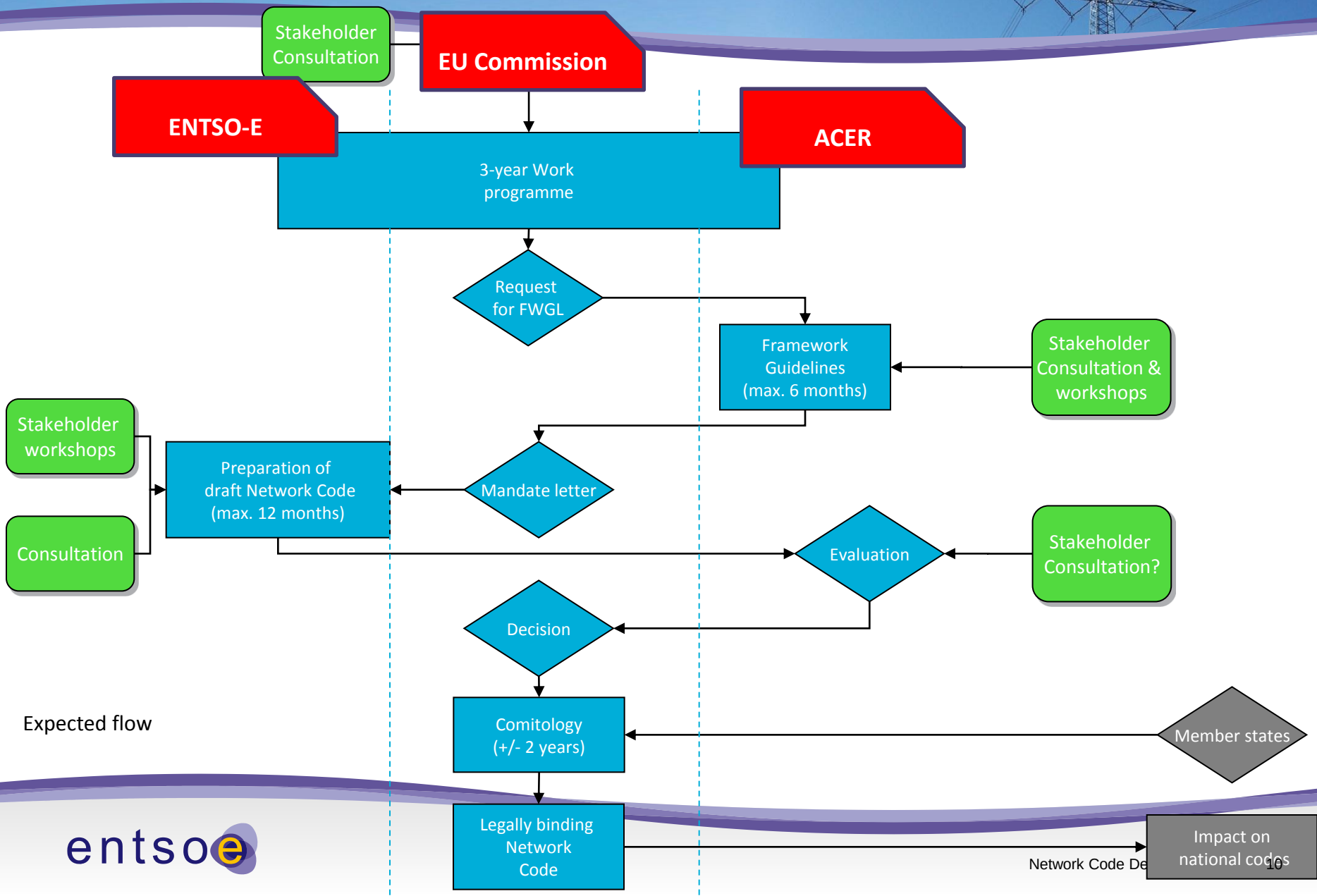
i. transparency rules;

j. balancing rules incl. network-related reserve power rules;

k. rules regarding harmonised transmission tariff structures incl. locational signals and inter-transmission system operator compensation rules; and

l. energy efficiency regarding electricity networks.

General Framework - Regulation 714/2009



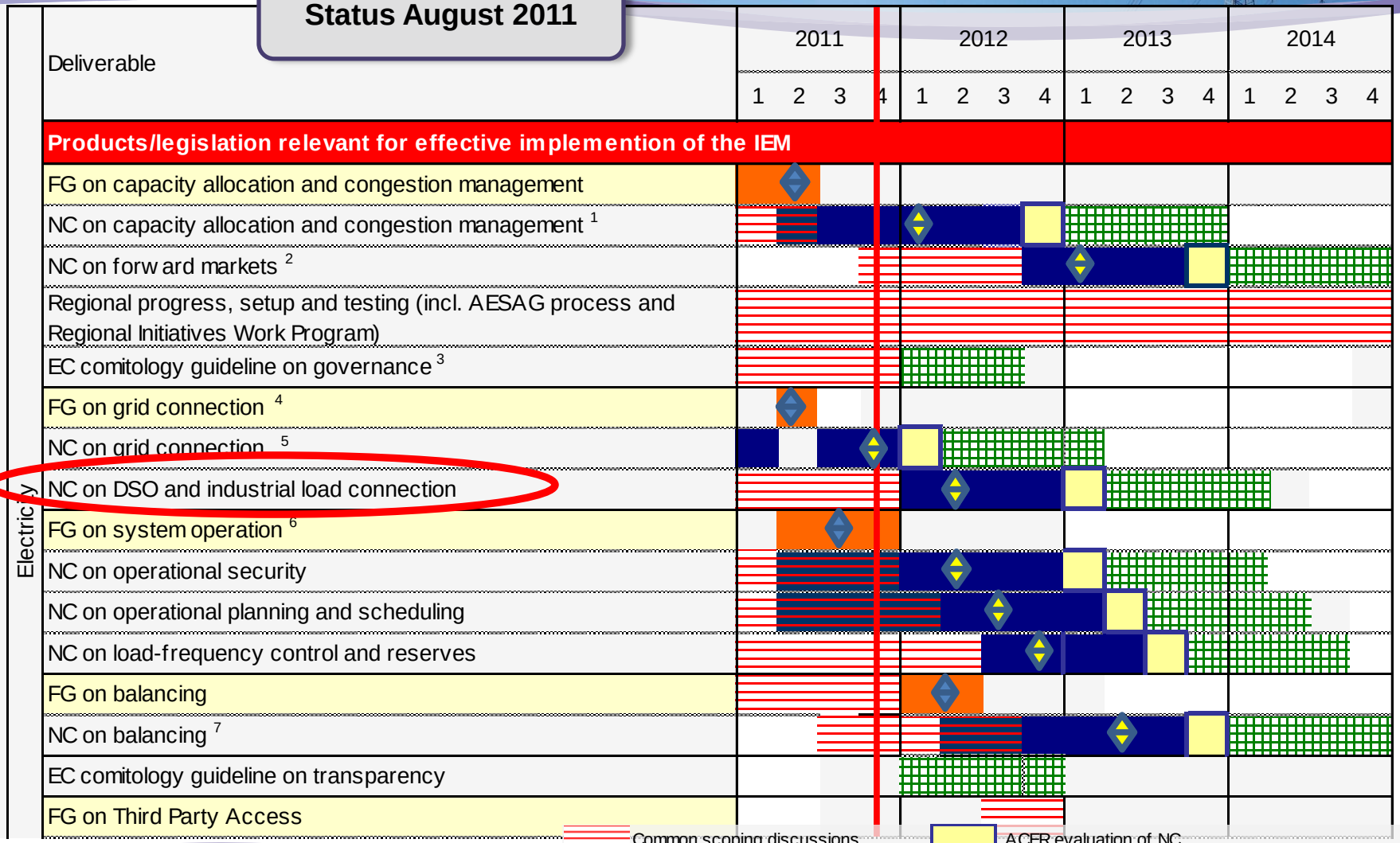
Expected flow

Prioritization of Network Codes

- **Discussed in the Florence Forum with all stakeholders**
- **Regularly discussed by EC / ACER / ENTSO-E**
- **Resulting in a three-year work program**
  - ***High priority***: Listing all Network Codes that are to be finalized by 2014 (creation of the European internal energy market)
  - ***Low priority***: timeline to be discussed
  - Under public consultation by EC (April 2011): http://ec.europa.eu/energy/international/consultations/20110410_external_dimension_en.htm

EC / ACER / ENTSO-E high priority list

Status August 2011



Network Code on Demand Connection – timeline *(provisional)*

- **Drafting team active since May 2011**
- **July 2011: ACER final framework guideline on electricity grid connection**
- **July – December 2011: initial stakeholder discussions**
  - Sequence of meetings with DSO associations
  - IFIEC
  - Relevant working groups of Mandate 490
- **Early 2012: Mandate letter EC**
- **Q1 2012: code drafting / internal ENTSO-E consultation**
- **Q2/Q3 2012: public consultation & review code draft**
- **End 2012: submission code to ACER**

Demand Connection Code scope

Demand Connection Code – Terms of References

based on the high level requirements set out in ACER's Framework Guidelines on Electricity Grid Connections (20 July 2011)

Demand Management Capabilities

- Load shedding

Frequency and voltage parameters;

Requirements for reactive power;

Load-frequency control related issues;

- Low Frequency Disconnection
- When this occurs
- Why it is used

Short-circuit current;

Requirements for protection devices;

Balancing capabilities and provision of ancillary services;

Equipment requirements at connection point;

Demand Connection Code – Terms of References

Disconnection/Islanding/Reconnection

- Methods/Procedures

Instructions provide by TSO/DSO to user;

- Manual/Auto
- How they are provided/received

Information/Data exchange

- What is required
- By whom
- When
- How it is provided

Compliance;

- What is tested
- How testing takes place
- Stages of Compliance testing

Derogation;

- What it is
- Whom it applies to
- How it is applied
- Exemptions

Enforcement period

- No longer than 3 years

Network Code for Generator Connection

– Based on same ACER Framework Guideline

– Trajectory started in Summer 2009

– To allow parallel work with different timeline and avoid confusion the Demand and Generator code are based on superposition of requirements

– Demand code will follow similar principles for existing users, derogations, compliance testing

– Codes developed within same ENTSO-E WG

Network Codes on System Operation aspects

– Final ACER Framework Guideline expected end of 2011

– ACER acknowledges overlap in guidelines

– Operational codes deal with operational issues

– Connection codes set functional requirements necessary to meet the needs of secure operation of the Transmission network (cross-border impact)

Market Network Codes

– Distinction between mandatory requirements of capabilities (grid connection codes) and the provision of ancillary services based on these capabilities (market / system operation codes)

Table of Contents *(preliminary)*

Principles of specific topics, relevant for industrial demand

Principles – Frequency and voltage parameters

– Follow NC RfG requirements for frequency and voltage ranges over Europe

– If generation is staying connected demand should also be able to do so for stability reasons

– Say nothing on standard voltages issues below 110kV

– Use RfG requirements rather than replicate in DCC for embedded industrial generation

– Flexibility for wider ranges on Frequency due to geographic differences - Islanding

Principles – Low Frequency/Voltage Disconnection and On Load Tap Blocking

– Existing requirements in Grid codes across Europe for LFDD

– LVDD used in some countries recent ENTSO-E work expects much wider use across Europe

– LVDD and OLTC Blocking expected to be required in tandem

Principles – Short-circuit current

– Short circuit ratings of equipment must not be exceeded

– Short circuit contribution must be provided for protection operation/quality (i.e. EMC)/stability

– Short circuit information must be given to TSO/DSO

– Inform users of what to expect from system

Principles – Disconnection/Islanding/Reconnection

– Islanding varies and therefore applications should be flexible

– Reconnection should be allowed following agreement with Relevant System Operator

– Synchronism devices to be fitted as specified by Relevant System Operator

– Automatic Disconnection from network must be able to be fitted application will be specified and method also

Principles – demand management capabilities, balancing capabilities and provision of ancillary services

Some services are voluntary driven by market, but once volunteered requirements will be mandatory

- System reserve
- Frequency Response (LFDD i.e. binary on/off)
- Frequency Response (Active power modulation control autonomous)
- Frequency Response (Active power control SO controlled)
- Very fast Frequency Response (Active power controlled SO controlled)
- Voltage Control (LVDD i.e. binary on/off)
- Voltage Control (Reactive power modulation control autonomous)
- Voltage Control (Reactive power control SO controlled)

Principles on requirements for reactive power

- Reactive compensation most cost effectively provided at point of use
- For equitability a maximum European reactive power range should be set
- Specific local driven reactive requirements should be permissible (within the maximum range)
- Reactive power ranges should allow for the effective use of capability requirements of embedded generation

Principles for equipment requirements at connection point

- Standard of connection not included i.e. 1 or 2 circuits, capacity of circuits, etc – Left to relevant SO and national standards/ regulation/procedures

- Equipment specified not separate section but as part of each requirement, i.e.
  - Need for communications equipment within signals section
  - Automatic disconnection under controls
  - Relays within protection
  - Monitoring equipment within monitoring requirements
  - etc

- Equipment specified at highest functional level allowing most technological variation

Principles for Instructions provided to end user

- Instructions themselves will be covered in Operation Code

- DCC Code will specify capabilities to provide/receive instruction and as a consequence some of the principles/rights for instructions i.e.
  - Set points for voltage control
  - Disconnection/Reconnection
  - Compliance – tests/procedural steps
  - Monitoring

- Not exclude manual operation only specify response times

– In line with requirements in Network Code for Generators (cfr. working draft version 27/10/2011)

- **First draft network code**
- **Public consultation (Q2/2012)**
- **Final submission end of 2012 (subject to EC mandate)**

Stakeholder interaction throughout the development process

Thanks for your attention