EUROPEAN NETWORK CODES
IMPLEMENTATION
ENERGY UK, LONDON - 25 NOVEMBER 2016
nationalgrid
EUROPEAN NETWORK CODES IMPLEMENTATION

ENERGY UK, LONDON - 25 NOVEMBER 2016

MARKETS & BALANCING TEAM
SYSTEM OPERATION
NATIONAL GRID
So what’s on the Agenda?
Welcome – Energy UK
  • Introduction & Welcome
  • European Network Code Process - How does it work in Europe?
  • Market Codes (CACM & FCA, Common Grid Model)
  • EU Balancing Guideline

11:00 Break (15 mins)
  • Operational Codes
  • Connection Codes
  • Joint European Stakeholder Workgroup
  • Proposal for implementation of European Network Codes – European Interface Document (EID)

12:00 Lunch & Networking ‘Come & talk to us’

13:00 Close Out
European Network Codes Implementation GB Delivery
So Who are we & what do we do?
European Network Codes Development Process
How does it work in Europe?
EUROPEAN 3RD PACKAGE DRIVERS

Enable renewables

Ensure supply security

Enhance competition

A Harmonised European Energy Market

Christopher Fox
Markets & Balancing Development
EUROPEAN NETWORK CODES DEVELOPMENT PROCESS

6 Months
ACER develops FWGL

EC
Programme

12 Months
EC invites ENTSO to develop NC

ENTSO develops Network Code

3 Months
ACER reviews Network Code

ACER recommends Network Code to EC

Revisions to code after opinion

ACER revises opinion

Commissions
Revisions
Preparations for Comitology

18 months to 3 years depending on code

Member state implementation

Publication in OJEU

Implementation

Council and Parliament Approval

Preparation for Cross-Border Committee

Cross-Border-Committee Discussion and Voting

†Time scales for the Comitology stages are not specified and under the Commission’s control

Christopher Fox
Markets & Balancing Development

25 November 2016
EUROPEAN NETWORK CODES DEVELOPMENT PROCESS

**Connection Codes**
- Requirement for Generators (RfG)
- Demand Connection Code (DCC)
- High Voltage Direct Current (HVDC)

**Market Codes**
- Forward Capacity Allocation (FCA)
- Capacity Allocation & Congestion Management (CACM)
- Balancing

**System Operation Codes**
- Operational Security (OS)
- Operational Planning (OP)
- Load Frequency Control & Reserve (LFC&R)
- Emergency & Restoration (E&R)

- Set of harmonised rules for new grid connections across EU, with a focus of ensuring system security
- Harmonising allocation rules for Interconnector
- Creating European wide implicit Day-Ahead and Intra-Day markets
- Regionalised cross border capacity calculation
- Development of pan-EU platforms for the exchange of standardised balancing energy products
- Harmonisation of imbalance settlement arrangements
- Setting minimum system security, operational planning and frequency management standards to:
  - Ensure safe and coordinated system operation across Europe, and
  - Create a standardised framework for regional cooperation.
- Harmonisation of system defence and restoration procedures during severe events

Christopher Fox
Markets & Balancing Development
Overview of the European Market Codes
So what does it mean?
OVERVIEW OF THE EUROPEAN MARKET CODES

It establishes a platform for managing capacity & flow around the interconnected system to facilitate a single EU market.

**Market Design**

Capacity Allocation & Congestion Management (CACM) Guideline
- Implicit Day Ahead & Intraday cross border trading
- Bidding zone reporting process and subsequent review

Forward Capacity Allocation (FCA) Guideline
- Long term transmission rights;
  - Physical Transmission Rights (PTRs) with Use It or Sell It (UIOSI)
  - Financial Transmission Rights (FTR) options
  - FTR obligations
- Single Allocation Platform with Harmonised Allocation Rules

**Regional Capacity Calculation**

- CACM and FCA both increase regional TSO coordination with capacity calculation used to determine interconnector capacities
- Calculation underpinned by a pan-EU Common Grid Model (CGM)
OVERVIEW OF THE EUROPEAN MARKET CODES

CACM and FCA have been published and become law within the UK;  
- CACM entry into force 14 Aug 2015  
- FCA entry into force 17 Oct 2016

TSOs, NEMOs to draft, consult, and submit proposals to regulators on detailed design aspects.  
**CACM proposals largely complete by end of 2018, FCA by end of 2019**

Any changes to GB codes to implement CACM and FCA will be raised and consulted on through the normal GB code governance routes

TSO = Transmission System Operator  
NEMO= Nominated Electricity Market Operator
NG and other TSOs will develop new processes to increase regional coordination.

Anyone trading Interconnector capacity in the forwards markets or trading cross border energy in the day ahead and intraday timeframes.

Generators and demand to provide information on which TSO decisions are made on a regional basis (see Common Grid Model).

Power exchanges (in their new role as NEMOs) will develop new processes to deliver a pan-EU marketplace.

Interconnector owners (current and future) will operate under new rules, including new requirements on interconnector firmness.
Common Grid Model (CGM)
So what is the Common Grid Model?
OVERVIEW OF THE EUROPEAN MARKET CODES

Common Grid Model (CGM)

- A European-wide network model assembled from each TSO’s individual grid model (IGM)
- Realistic and accurate representation of the Transmission & Distribution networks
- One scenario for each market time unit (1 hour)
- Built to a common standard with a harmonised modelling approach
- Used as a key tool for many new coordinated European processes – including capacity calculation

Rolling Daily Process that supports target model

Each TSO’s IGM is built using the latest available data from market participants for specific delivery times

TSO A IGM

TSO B IGM

TSO C IGM

TSO A IGM

TSO B IGM

TSO C IGM

Day Ahead Market (Auctions)

Intraday Market (Continuous)
So when does it come into effect?

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Key: Project, Proposal, Deadline

James Bradley
Markets & Balancing Developments

25 November 2016
Overview of the EU Balancing Guideline
OVERVIEW OF THE EUROPEAN MARKET CODES

Pan-EU Balancing Energy Market
- Development of pan-EU platforms for the exchange of standard balancing energy products
- 6 year implementation period
- Replacement Reserves (RR)
- Manual Frequency Restoration Reserves (mFRR)
- Specific products retained nationally

Harmonisation of Market Design & Settlement
- Harmonised Gate Closure Time for standard products
- Harmonisation of ISP at Synchronous Area level
- Harmonisation of imbalance arrangements (preference for single imbalance pricing)
- Harmonisation of reserve procurement arrangements

Cross Zonal Capacity Reservation (CZC)
- Opens the possibility for TSOs to reserve XB capacity for the exchange of balancing energy
- Co optimisation with market timeframes
- TSOs to develop detailed methodologies

Early Implementation – Project TERRE
So when is it going to happen?

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Key: Project, Proposal, Deadline

EIF = Entry into Force

Christopher Fox
Markets & Balancing Development
OVERVIEW OF THE EUROPEAN MARKET CODES

**TSOs:** Access to a wider pool of flexibility EU Platforms procurement closer to real time

**Balancing Service Providers:** New standard products; Access to EU market; Level playing field

**Balance Responsible Parties:** Harmonised imbalance settlement; Imbalance Adjustment; More accurate price signals

**Interconnectors:** Facilitation of exchange of A/S; More variability
BREAK

Lets have a 15 minute Break!
Overview of the EU System Operation Codes

John Young
Markets & Balancing Development
Harmonises the processes that TSO have to manage their systems, including system operation

**Transmission System Operation Guideline (TSOG):** system security, operational planning and frequency management standards

**Operational Security**
- Data Exchange
- System States
- System Management

**Operational Planning**
- Regional security coordination
- Outage coordination
- Adequacy

**Load Frequency Control & Reserves**
- Operational agreements
- Quality targets

**Emergency & Restoration Code (E&R):** Harmonisation of system defence and restoration procedures during severe events

John Young
Markets & Balancing Development
## OVERVIEW OF THE EU SYSTEM OPERATION CODES

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**Key**

- **Project**: Green
- **Proposal**: Blue
- **Deadline**: Red

---

John Young  
Markets & Balancing Development  
25 November 2016
OVERVIEW OF THE EU SYSTEM OPERATION CODES

So am I impacted?

**TSOs**
- More transparency in system operation
- Operational security analysis
- Cross-border processes

**Generators**
- New data exchange requirements
- Including for distribution connected SGUs

**Distribution Network Operators**
- New data exchange requirements and outage coordination responsibilities

**Interconnectors**
- Facilitation of exchange of A/S
- Including agreements for cross-border processes
Overview of the EU Connection Codes

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25 November 2016
OVERVIEW OF THE EU CONNECTION CODES

Requirement for Generation (RfG)

New Generation connections to Distribution & Transmission systems in Europe

High Voltage Direct Connect (HVDC)

New High Voltage Direct Connections to Transmission Systems in Europe

Demand Connection Code (DCC)

New Demand Connections to GSP to Transmission systems in Europe. Provisions on Demand Side Response (DSR).

RfG – Current Banding Levels permitted for GB

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Current Great Britain Definitions

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Rob Wilson
Markets & Balancing Development
OVERVIEW OF THE EU CONNECTION CODES

So am I impacted?

**RfG**
Generators
Any Generators over 800W in size who buy equipment after May 2018

**HVDC**
New HVDC Schemes
(Including DC Connected Wind Farms). New HVDC equipment bought after September 2018

**DCC**
New Distribution Networks
Transmission Connected Demand Facilities
New HVDC equipment bought after September 2018 (including connected Windfarms)
## Overview of the EU Connection Codes

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### Key
- **Milestone**
- **Project**

**EIF** = Entry Into Force

- **17/05** Applies to new users
- **29/09** Applies to new users
- **07/09** Applies to new users

**25 November 2016**

Rob Wilson
Markets & Balancing Development
So how do I get involved?

- **Requirements for Generation (RfG):** GC0048 Workgroup (Grid code & Distribution Code)

- **High Voltage Direct Connect (HVDC):** GC0090 Workgroup (Grid Code)

- **Demand Side response (DCC):**
  GC0091 Workgroup (Grid Code & Distribution Code)
The Joint European Stakeholder Group is a GB Stakeholder forum which will cover the development, Comitology process and implementation of European Network Codes (ENC). It provides a single group for GB stakeholders to engage on all aspects of European Policy.

Want to get Involved?
- WebEx/teleconference facilities available
- Weekly update – sign up on feedback form
- Monthly meetings – come along, held at Elexon offices, London
- Next meeting: 13 December 2016 – EID discussions.
- Come and talk at lunch should you want to know anymore
ENC IMPLEMENTATION APPROACH

CURRENT APPROACH MULTIPLE INTERACTIONS TO MANAGE

Alex Thomason
Markets & Balancing Development
# ENC IMPLEMENTATION APPROACH

**CURRENT APPROACH: MULTIPLE INTERACTIONS TO MANAGE**

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* This is an initial view produced by National Grid. This needs to be validated with Code Administrators and stakeholders and as such does not represent an agreed plan.

Alex Thomason  
Markets & Balancing Development  
25 November 2016
ENC IMPLEMENTATION APPROACH
ALTERNATIVE OPTIONS – FULL EID

Connection Codes
- DCC
- HVDC
- RfG

Operational Codes
- TSOG
- E&R

Market Codes
- FCA
- CACM

Balancing Code
- New EU Processes (e.g. TERRE)
- XB Reservation
- General Compliance
- Imbalance Settlement

European Interface Document (EID)

- Grid Code
- STC
- CUSC
- SQSS
- DCode
- DCUSA
- BSC

Alex Thomason
Markets & Balancing Development

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WHAT ARE THE OPTIONS?

Are there other options that avoid licence changes and creating a whole new code?

Option 1: Create new EID section in corresponding GB codes

Option 2: Create new EID covering all new EU processes and append to only one existing GB code

Option 3: Append the same new EID to all existing codes

Option 4: Incorporate most new EU processes into new, non-legally binding document

Alex Thomason
Markets & Balancing Development

25 November 2016
- JESG is seeking views on the options
- Responses welcomed by 7 December 2016
- Discuss responses at December JESG
- Scoring matrix available to help frame responses
LUNCH & NETWORKING

Come & talk to us!
Thank you

Have a safe Journey