

# EUROPEAN NETWORK CODES IMPLEMENTATION

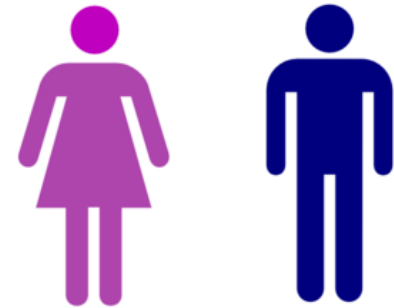
ENERGY UK, LONDON - 25 NOVEMBER 2016



nationalgrid

# FACILITIES

---



# EUROPEAN NETWORK CODES IMPLEMENTATION

ENERGY UK, LONDON - 25 NOVEMBER 2016



MARKETS & BALANCING TEAM  
SYSTEM OPERATION  
NATIONAL GRID

# WELCOME

---

So what's on the Agenda?



Teresa Thompson  
Markets & Balancing Development

## 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

# WELCOME

---

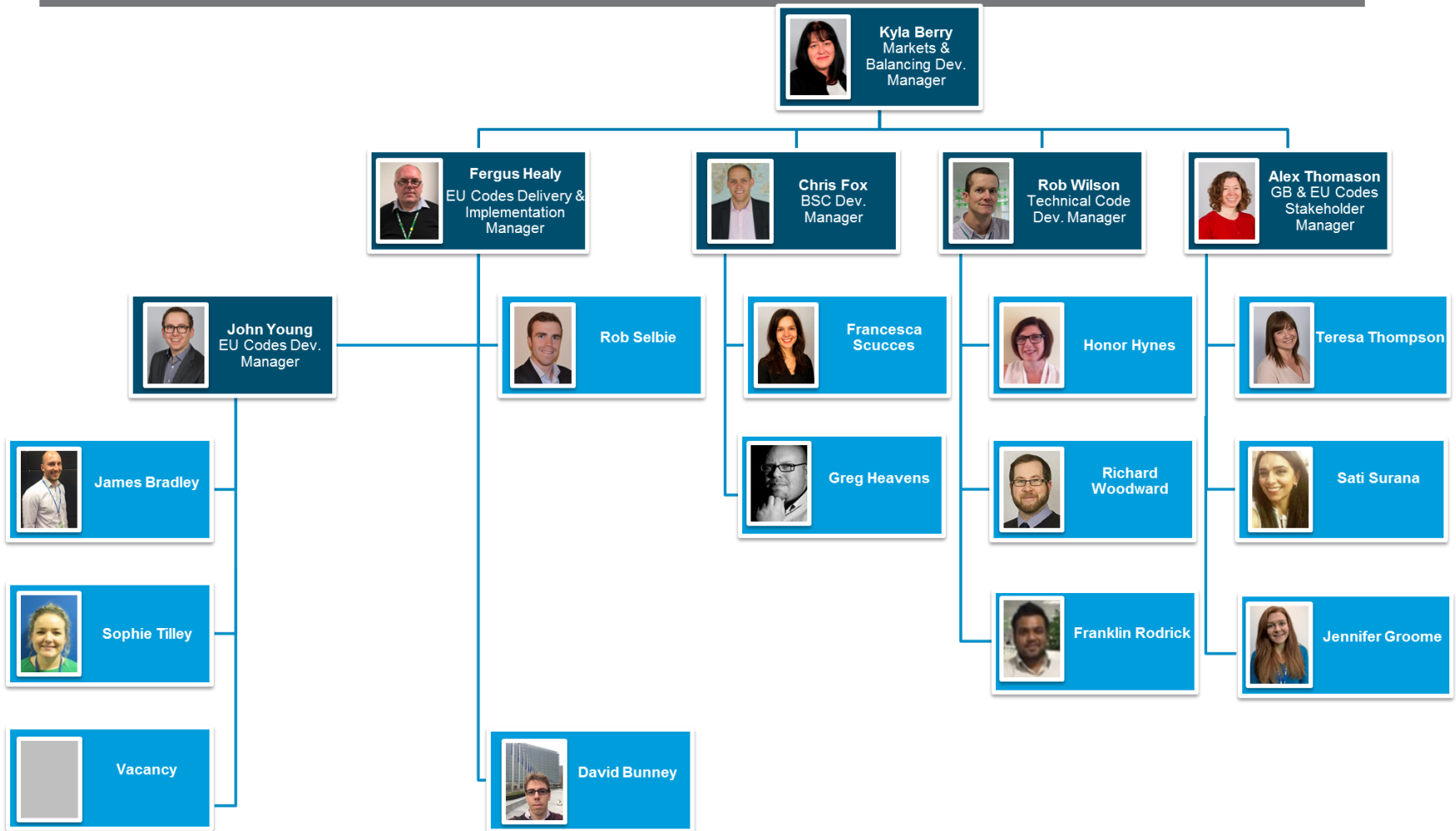
## European Network Codes Implementation GB Delivery So Who are we & what do we do?



25 November 2016

Kyla Berry  
Markets & Balancing Development Manager  
Markets & Balancing Development

# MEET THE TEAM – MARKETS & BALANCING DEVELOPMENT



25 November 2016

Kyla Berry  
Markets & Balancing Development Manager  
Markets & Balancing Development

## EUROPEAN NETWORK CODES DEVELOPMENT PROCESS

---

### European Network Codes Development Process How does it work in Europe?



25 November 2016

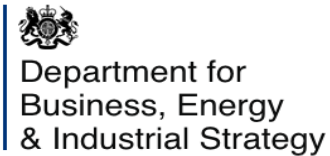
Christopher Fox  
Markets & Balancing Development



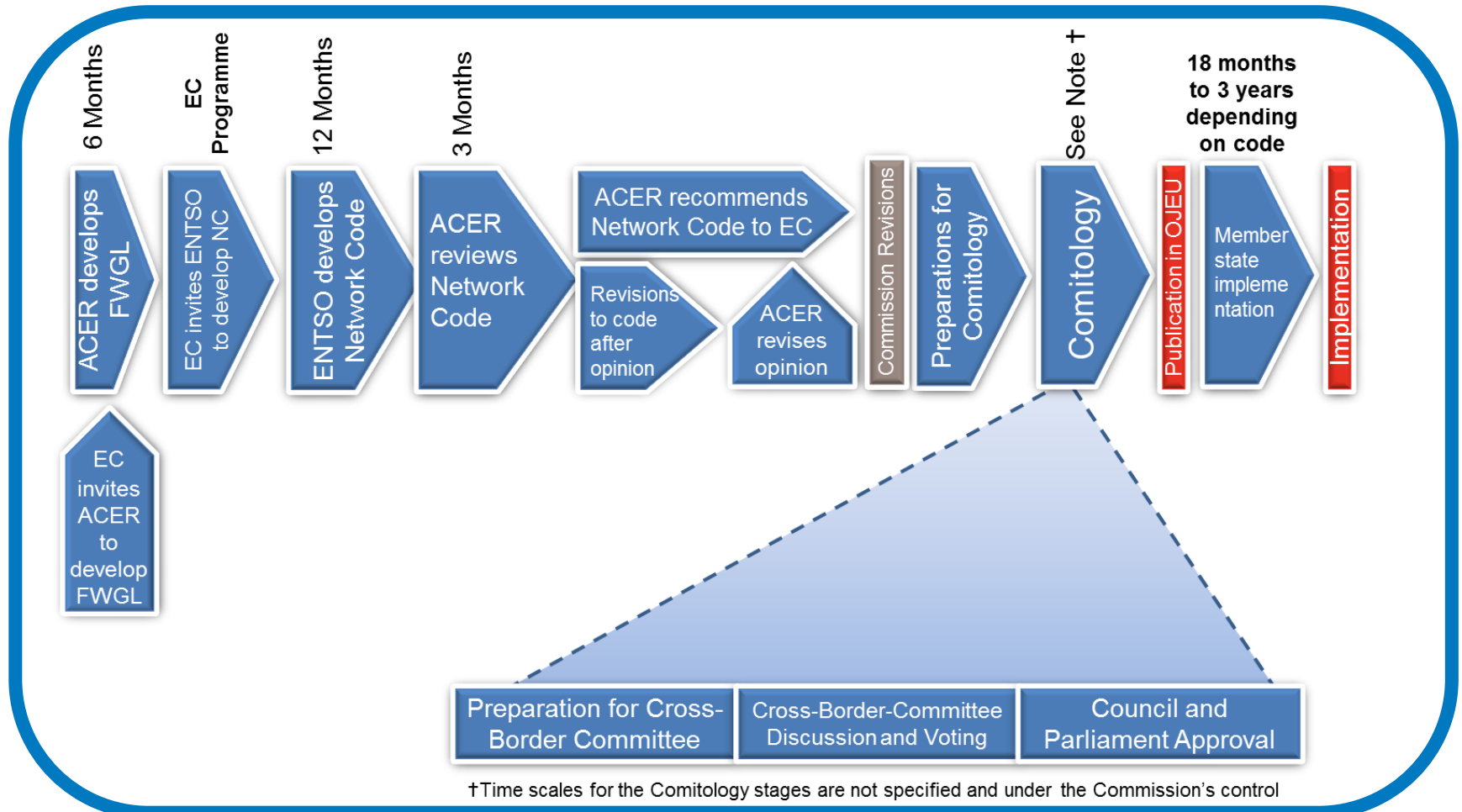
## EUROPEAN 3<sup>RD</sup> PACKAGE DRIVERS



## EUROPEAN NETWORK CODES DEVELOPMENT PROCESS



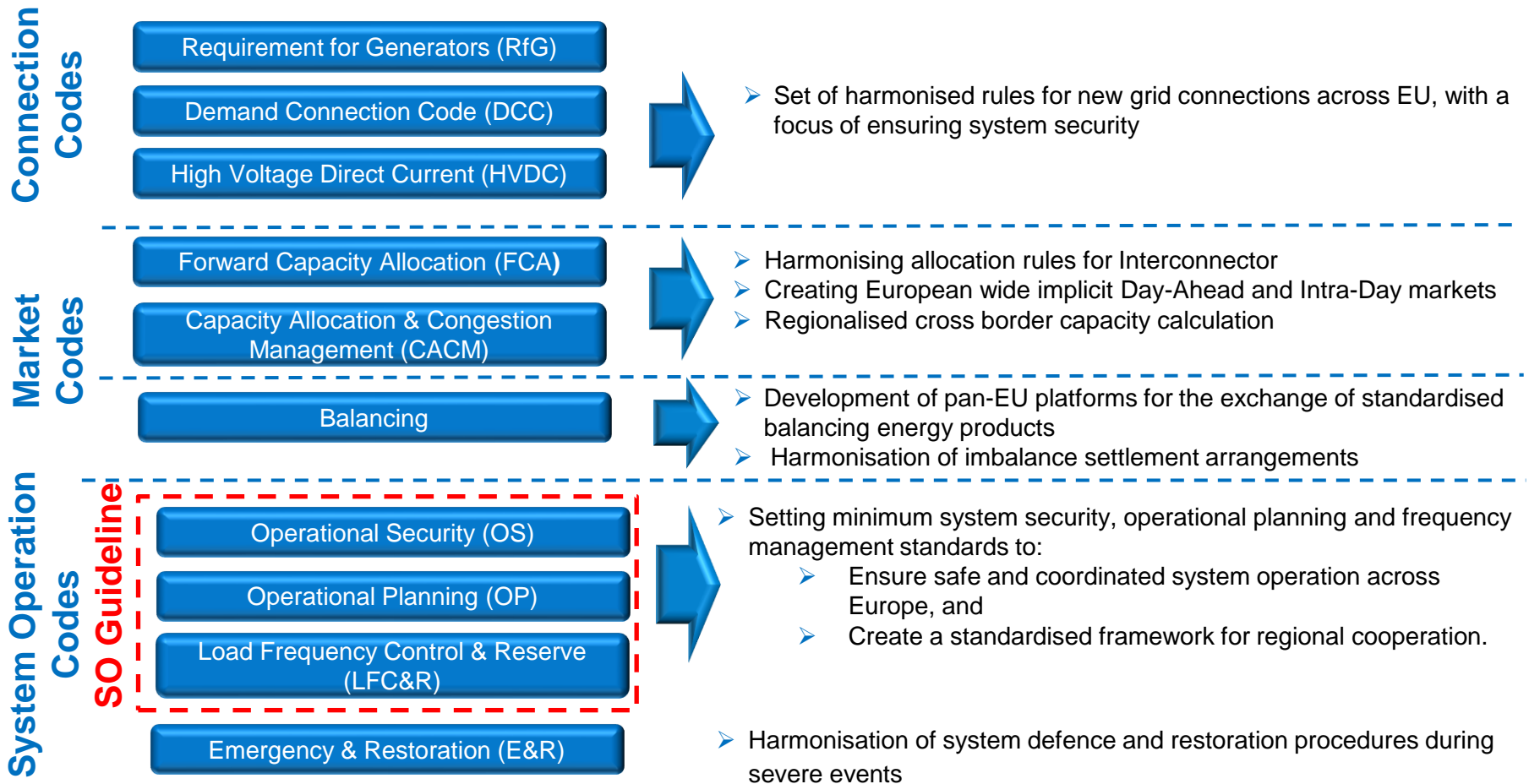
# EUROPEAN NETWORK CODES DEVELOPMENT PROCESS



25 November 2016

Christopher Fox  
Markets & Balancing Development

# EUROPEAN NETWORK CODES DEVELOPMENT PROCESS



## OVERVIEW OF THE EUROPEAN MARKET CODES

---

### Overview of the European Market Codes So what does it mean?



Rob Selbie  
Markets & Balancing Development

# 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

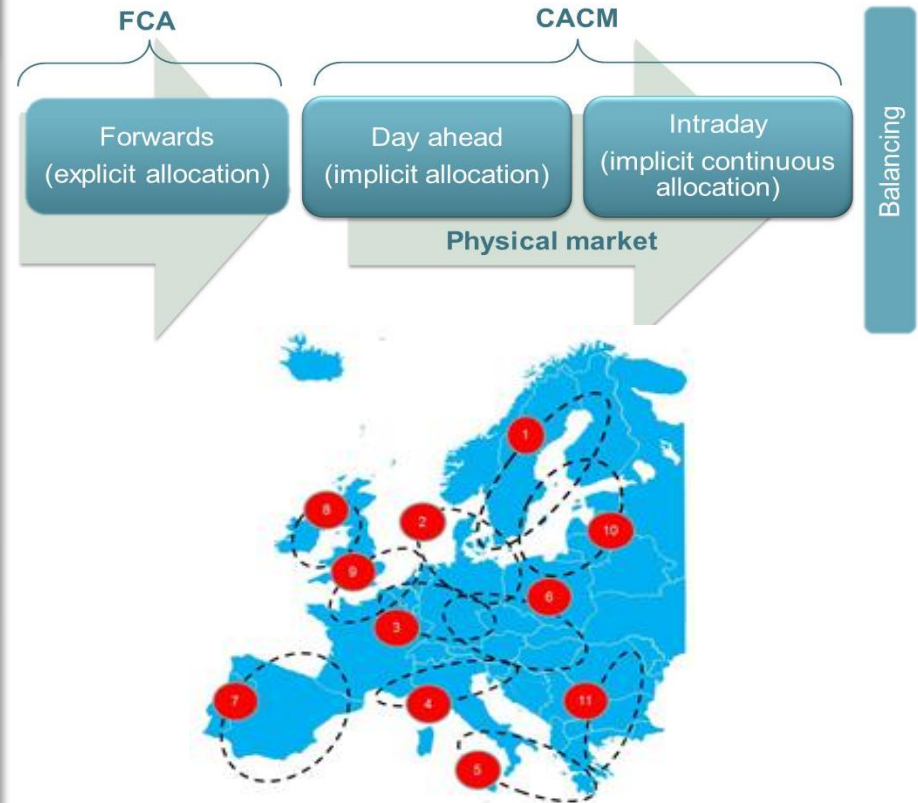
- Implicit Day Ahead & Intraday cross border trading
- Bidding zone reporting process and subsequent review

### 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

## OVERVIEW OF THE EUROPEAN MARKET CODES



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



## OVERVIEW OF THE EUROPEAN MARKET CODES

---

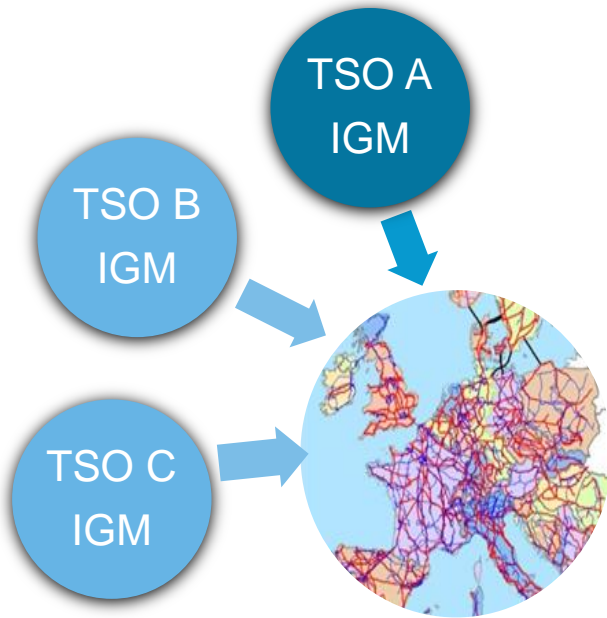
### Common Grid Model (CGM) So what is the Common Grid Model?



25 November 2016

James Bradley  
Markets & Balancing Developments

# OVERVIEW OF THE EUROPEAN MARKET CODES



## Common Grid Model (CGM)

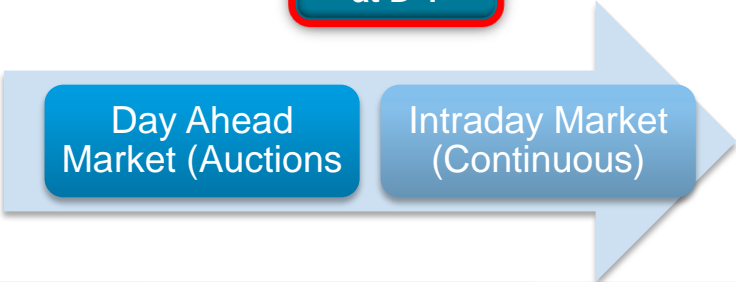
- A European-wide network model assembled from each TSO's individual grid model (IGM)
- Realistic and accurate representation of the Transmission & Distribution networks
- One scenario for each market time unit (1 hour)
- Built to a common standard with a harmonised modelling approach
- Used as a key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

**CGM built at D-2**

**CGM built at D-1**



# OVERVIEW OF THE EUROPEAN MARKET CODES

So when does it come into effect?

Obligations	2016			2017				2018		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
ENC deadlines	↓ CACM EIF Aug 2015	FCA EIF		TSOG EIF	Update CGMM & GLDPM for FCA (Long-term timescales)		Update CGMM & GLDPM for TSOG			
CGM Methodology		DA & ID CGM Requirements (for CACM) delivered	NRA approval	TSO develop IGM capability	Early testing and parallel run of CGM process		CGM process fully operational			
GLDP Methodology		DA & ID data requirements for CACM) delivered	NRA approval	TSOs publish list of parties required to provide data			Data Provision process fully operational			

Key	Project	Proposal	Deadline
-----	---------	----------	----------

25 November 2016

## OVERVIEW OF THE EUROPEAN MARKET CODES

---

### Overview of the EU Balancing Guideline



25 November 2016

Christopher Fox  
Markets & Balancing Development

## 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

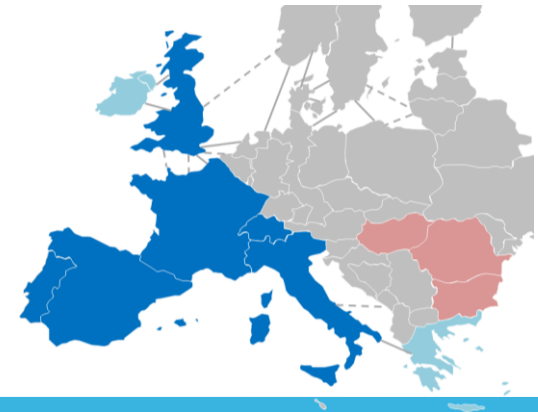
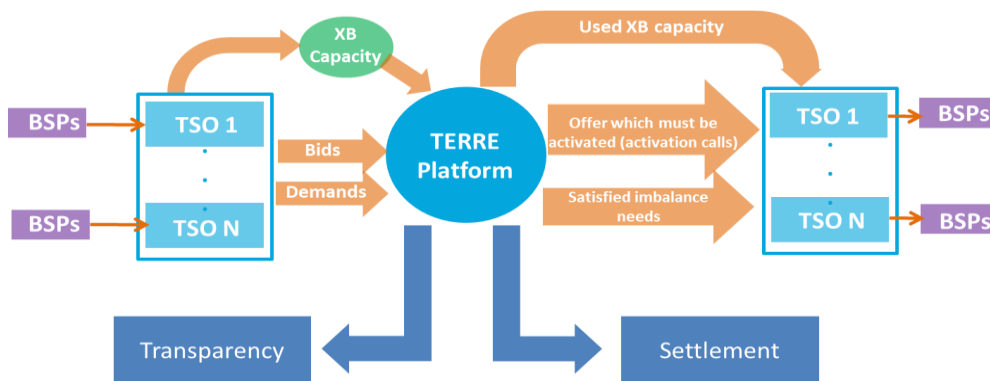
## Harmonisation of Market Design & Settlement

- 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

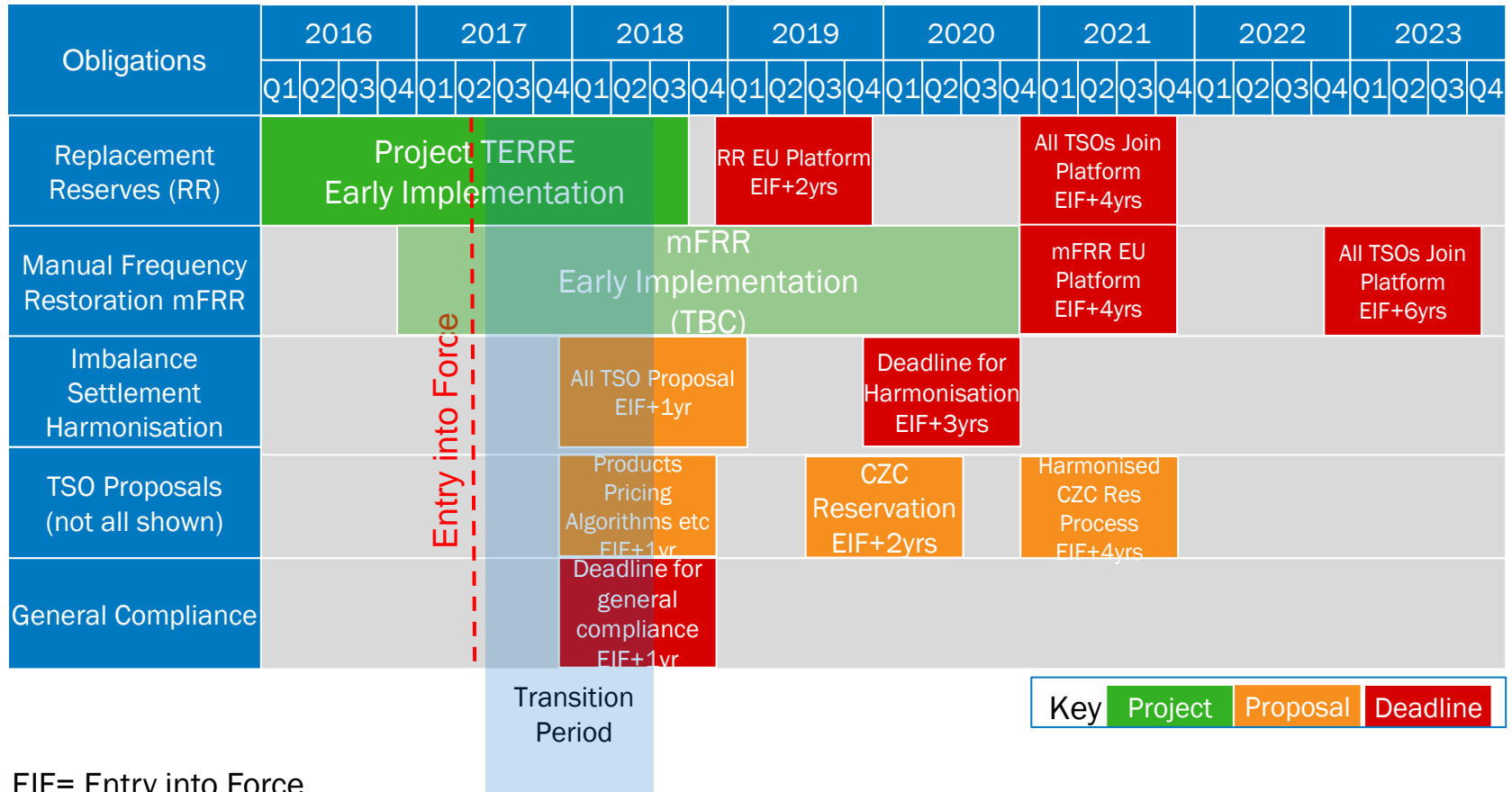
### Early Implementation – Project TERRE



25 November 2016

# OVERVIEW OF THE EUROPEAN MARKET CODES

So when is it going to happen?



25 November 2016

Christopher Fox  
Markets & Balancing Development

## OVERVIEW OF THE EUROPEAN MARKET CODES

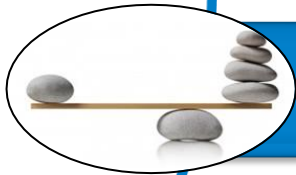
---



**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

Lets have a 15 minute Break!





## Overview of the EU System Operation Codes



John Young  
Markets & Balancing Development

# OVERVIEW OF THE EU SYSTEM OPERATION CODES

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

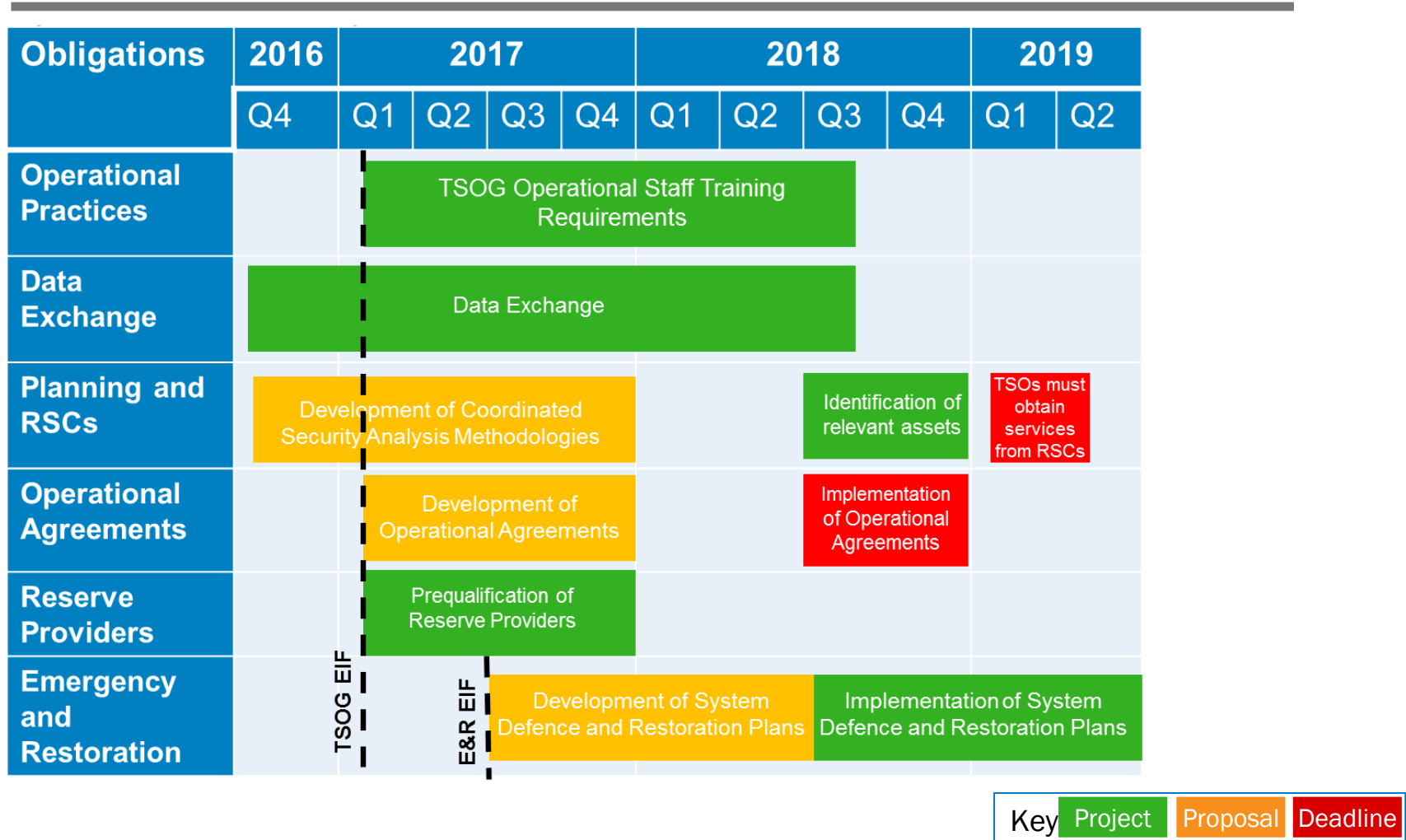
- Regional security coordination
- Outage coordination
- Adequacy

## Load Frequency Control & Reserves

- Operational agreements
- Quality targets

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

# OVERVIEW OF THE EU SYSTEM OPERATION CODES



25 November 2016

John Young  
Markets & Balancing Development

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

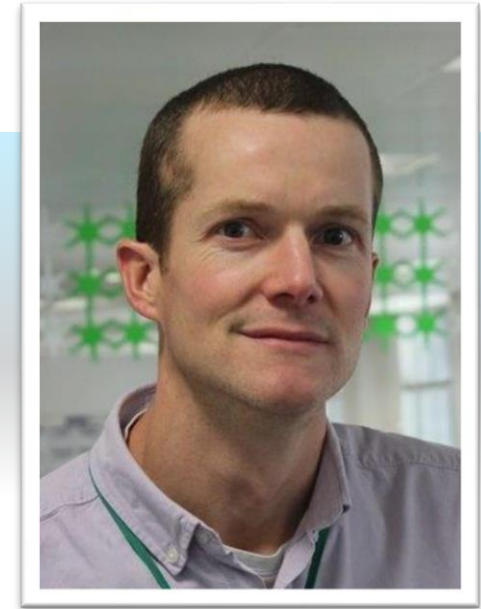
Facilitation of exchange of A/S  
Including agreements for cross-border processes



## OVERVIEW OF THE EU CONNECTION CODES

---

### Overview of the EU Connection Codes



Rob Wilson  
Markets & Balancing Development

Requirement for Generation (RfG)	High Voltage Direct Connect (HVDC)	Demand Connection Code (DCC)
New Generation connections to Distribution & Transmission systems in Europe	New High Voltage Direct Connections to Transmission Systems in Europe	New Demand Connections to GSP to Transmission systems in Europe. Provisions on Demand Side Response (DSR).

## RfG – Current Banding Levels permitted for GB

Maximum RfG banding levels permitted for Great Britain		
Type	Connection Voltage	Capacity
A	<110kV	800 W – 1 MW
B	<110kV	1MW – 50 MW
C	<110kV	50MW – 75MW
D	<110kV	75MW+

Current Great Britain Definitions			
Generator Size	SHET	SPT	NGET
Small	<10MW	<30MW	<50MW
Medium			50 MW – 100MW
Large	>10MW	>30MW	>1000MW

So am I impacted?

## RfG

### Generators

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



## HVDC

### New HVDC Schemes

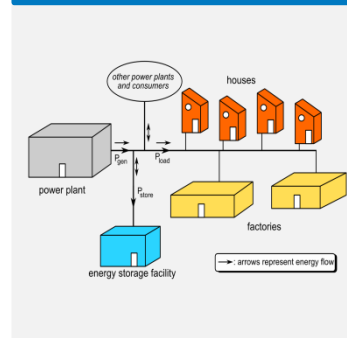
(Including DC Connected Wind Farms).  
New HVDC equipment bought after September 2018



## DCC

### New Distribution Networks Transmission Connected Demand Facilities

New HVDC equipment bought after September 2018 (including connected Windfarms)



# OVERVIEW OF THE EU CONNECTION CODES

	2016				2017				2018	2019
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4		
RfG		17/05 EIF							17/05 Applies to <u>new</u> users	17/05 GB must be compliant
	GC0048 Grid Code/D-Code Workgroup Phase									
HVDC			29/09 EIF						29/09 Applies to <u>new</u> users	29/09 GB must be compliant
					GC0090 Grid Code Workgroup Phase					
DCC			07/09 EIF						07/09 Applies to <u>new</u> users	07/09 GB must be compliant

Key:

Milestone

Project

EIF = Entry Into Force



## OVERVIEW OF THE EU CONNECTION CODES

---

### 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)



# JOINT EUROPEAN STAKEHOLDER GROUP

---

## European Interface Document



Alex Thomason  
Markets & Balancing Development

25 November 2016

## OVERVIEW OF THE JOINT EUROPEAN STAKEHOLDER GROUP

**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

Barbara Vest  
Director of Generation  
(Chair)



Chrissie Brown  
NETSO Code Administration  
(Technical Secretary)

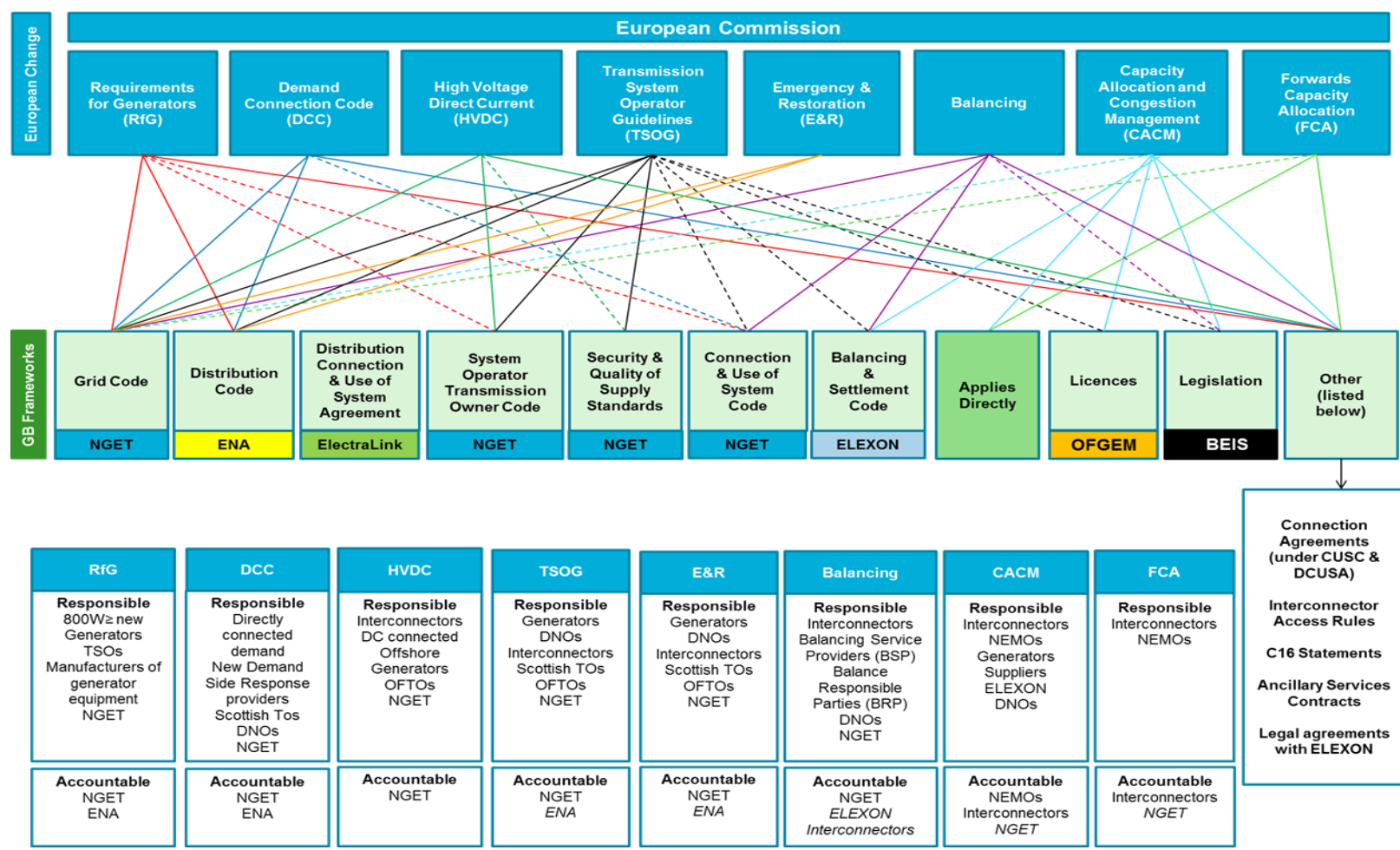
nationalgrid

Christine Brown  
National Grid Electricity Transmission  
Code Administrator

25 November 2016

# ENC IMPLEMENTATION APPROACH

## CURRENT APPROACH MULTIPLE INTERACTIONS TO MANAGE



25 November 2016

Alex Thomason  
Markets & Balancing Development

# ENC IMPLEMENTATION APPROACH

## CURRENT APPROACH MULTIPLE INTERACTIONS TO MANAGE

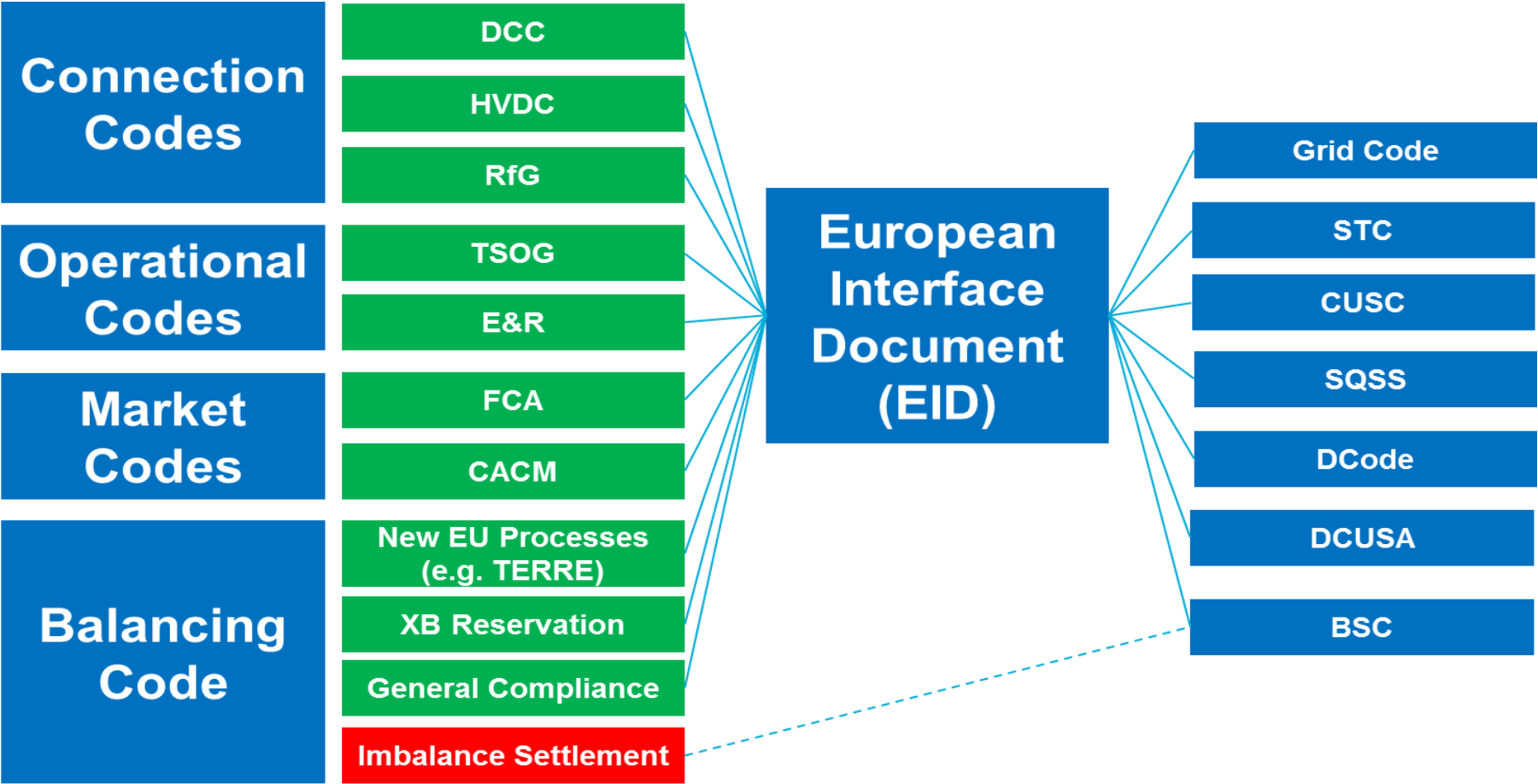
GB Mods	2016				2017				2018				2019				Total
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Grid Code	2	2	3	4	8	6	2	2	2	2	1						34
BSC		2			4	1	1	1		1			1				11
C16					1					1			1				3
CUSC					1					1							2
SQSS					1	1						1					3
I/C Access Rules					3					1							4
STC					2	1											3
D-Code	2	2	3	3	2	1	1	1									15
D-CUSA																	
Licences				1	1												2
Total	4	6	6	8	23	10	4	4	2	6	1	1	2				77

Draft\*

\* 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

# ENC IMPLEMENTATION APPROACH

## ALTERNATIVE OPTIONS – FULL EID

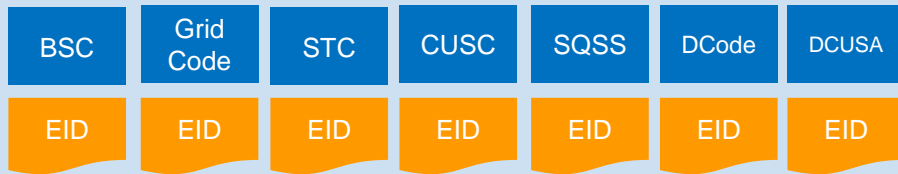


# ENC IMPLEMENTATION APPROACH

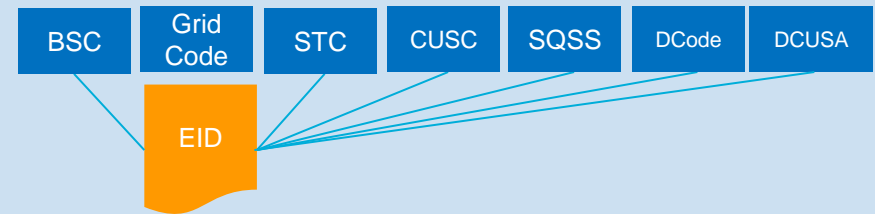
## WHAT ARE THE OPTIONS?

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

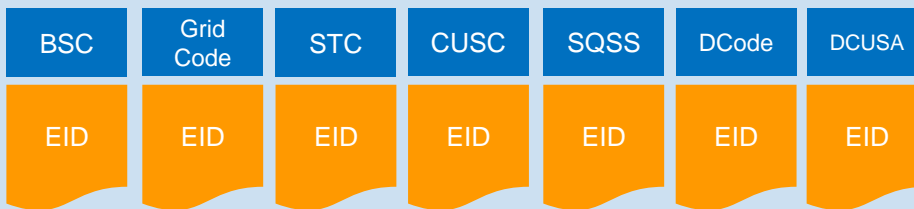
Option 1: Create new EID section in corresponding GB codes



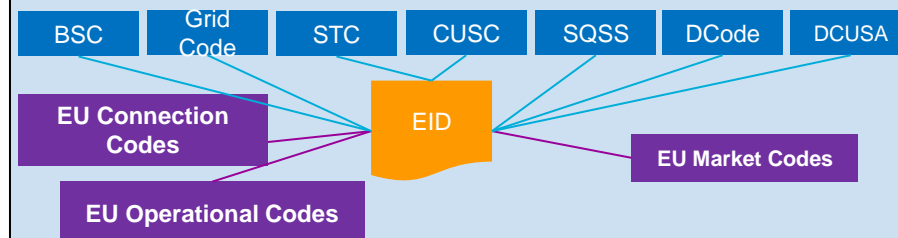
Option 2: Create new EID covering all new EU processes and append to only one existing GB code



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



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



## NEXT STEPS

---

- 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





Come & talk to us!



CLOSE

---



nationalgrid

THANK YOU

Have a safe Journey

