

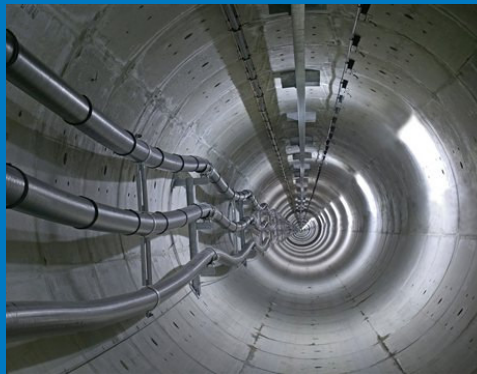
## National Grid Customer Seminar



Mike Calviou  
Director of Transmission Network Service

April 2013

## National Grid Customer Seminar



Nicola Paton  
Head of Customer Service

April 2013

## Today's Agenda

---

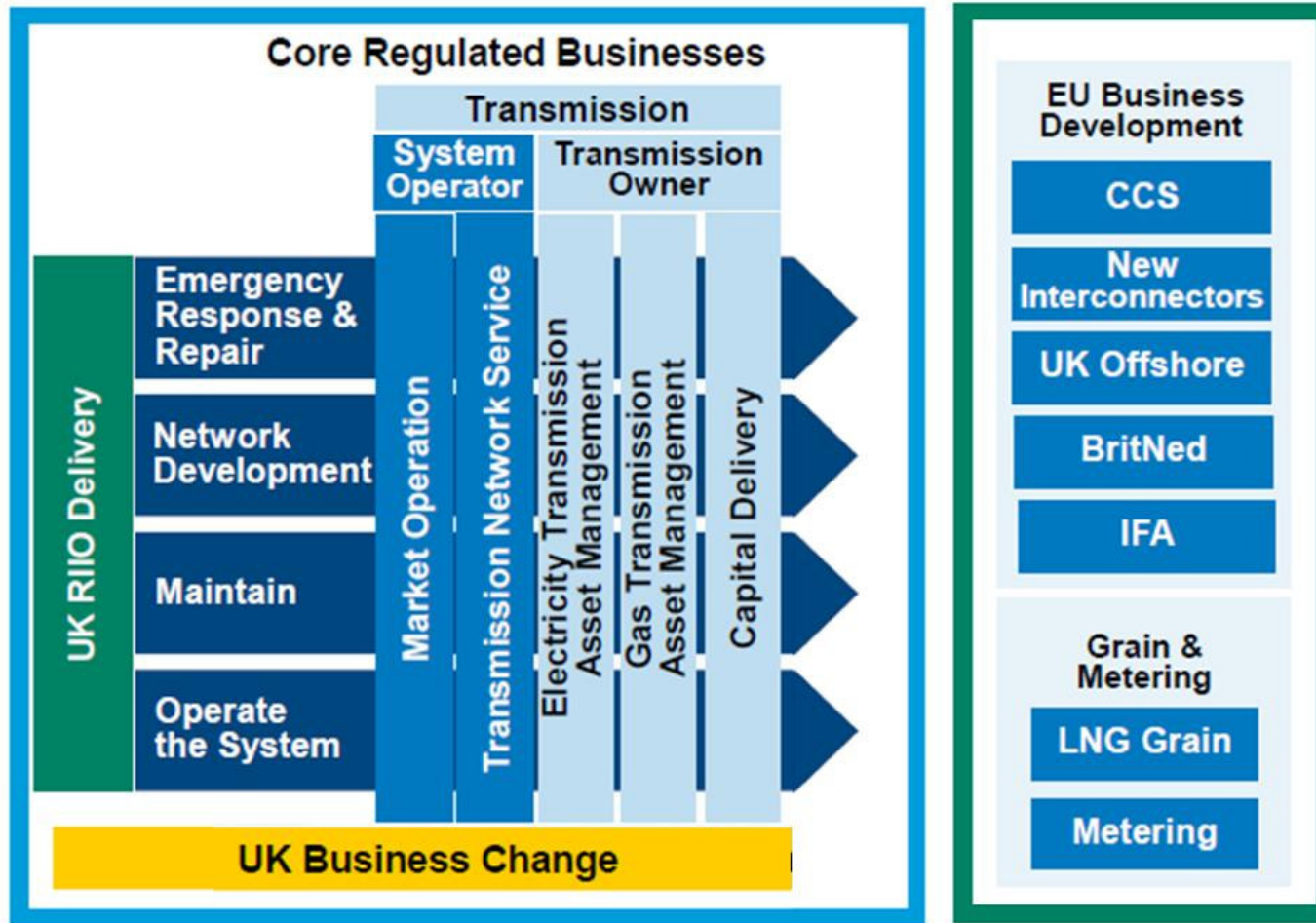
- Key Policy and Connections Update
- Customer & Stakeholder Engagement
- Electricity Market Reform
- Charging & Access Development
- Grid Code & European Network Codes
- TO Business Update
- Grid Operation in 2020
- Ofgem: ITPR Work to Date

# Organisational Changes - Drivers

---

- RIIO
- Customer and Stakeholder Focus
- Electricity Market Reform
- Europe
- Smarter Asset Management
- Efficient Capital Delivery Growth
- New Incentives and Penalties

# UK Operating Model



SSR – UK Regulation – Finance & Shared Services – IS – Legal – HR – Corporate Affairs

## Principles Applied in new Structure

---

- Clear accountabilities
- Build capability – recruit the right people with the right skills
- More streamlined decision making
- Strong platform for growth under the RIIO mechanism

## Key Policy and Connections Update



Julian Leslie  
Electricity Customer Service Manager

April 2013

## Electricity Connections

---

- TEC Reductions (existing) / TEC Amnesty (future) Results
- Connect and Manage Update
- CMP192 – Enduring User Commitment
- CMP212 - Loss of Transmission Access
- BELLA participation in the Balancing Mechanism
- Intertrips
- Electricity Ten Year Statement



# TEC Reductions and TEC Amnesty

---

- **TEC Reductions 2013/2014**
  - 7.4GW closed 31/3/13 notified in 2012
  - 1.3GW closed 31/3/13 notified in 2013
  - 2.15GW to close 31/3/14
  
- **Number of Applications**
  - Overall Applications: 21 (7 in each TO area)
  
- **Number of MW Offered Back**
  - Total: 1774MW
    - NGET: 1403MW\* (one site submitted 3 apps ranging from 700MW - 3600MW)
    - SHET: 175MW
    - SPT: 196MW

# Connect and Manage Update

## The “Connect” part (data as of 31 March 2013)

- 34GW of Connect and Manage plant

CONNECT AND MANAGE	Transmission and Large Embedded	Small Embedded
Number of Connected Sites	10	66
Connected MW	542	318
Number of Future Sites	143	121
Future MW	32878	591
Average connection date advancement	5 years	10 years

## The “Manage” part (data as of 31 December 2012)

- Total Connect and Manage constraint costs for the 10 Large Embedded/Transmission Connected sites connected under C&M is ~ **£7.4m**

# Connect and Manage – More Information

---

- Latest Quarterly Report published 4 February 2013 to cover 1 September to 31 December 2012 can be located at the following link:

<http://www.nationalgrid.com/NR/rdonlyres/C58A2961-91C5-49C4-ADCC-302AE8F4FC04/58783/ConnectandManageQuarterlyReport010912to311212v1.pdf>

- Quarterly Report to cover 1 January 2013 to 31 March 2013 to be published shortly.

- Further guidance on Connect and Manage can be found at the following link:

<http://www.nationalgrid.com/NR/rdonlyres/8D4A5CB7-EDAA-4AB3-99A7-685E9772C2C8/59263/CMversion50.pdf>

## CMP192 – Enduring User Commitment

---

- Objectives
  - Protect end consumer from undue risk
  - Understand minimum notice period to alter TO investment before significant costs incurred
  - Likelihood of projects terminating or closing
  - Applies to pre and post commissioning generators
- Result
  - Many mod apps processed to move connection date outside of 4 year window
  - >250 (including stages and embedded generation) agreements signed posting security of £219m covering a liability of £437bn

## CMP192 – Enduring User Commitment

---

- Policy Decisions Made
  - How to deal with Non firm connections
  - Interconnectors remain on previous arrangements until April 2015
  - Drop to 10% security planning consent trigger defined
- Guidance document and FAQs published
- Next Steps
  - House keeping Code Modification?
  - Online example model spreadsheet

## CMP212 - Loss of Transmission Access

---

- Implemented January 2013
  - Introduces administered timescales to resolving such claims
  - No change to CAP48 rationale
- Key Points
  - Claims for incidents prior to January 2013 had to be submitted by 24 February 2013
  - Generators have 30 days from incident to submit claim. The form is available via the below link:  
<http://www.nationalgrid.com/NR/rdonlyres/596DF285-FB16-4DDA-A29B-83A89CE1B247/58621/CMP212ClaimFormv1.doc>
  - NETSO has 60 days to confirm if valid
  - If a is value agreed, payment will be processed within 28 days

# BELLA Participation in the Balancing Mechanism (BM)

---

- Option since December 2012
  - Supplier registers additional BM Unit on behalf of BELLA party
- Open to new BELLA parties or existing BELLA parties (via a Mod App)
- Within 28 days of 'Clock Start', receive Offer
  - Requirements of BM participation detailed in Appendix F5
- We all work together to deliver the requirements in Appendix F5

# Intertrips

---

- Review of Intertrip Categories
  - Increasing amount of generation on our network
  - Introduction of Connect & Manage
- Proposed Revisions
  - Fast deload service to be allowed in Cat 1 (Customer request) and Cat 2 (overload relief) intertrips
  - Cat 5 stability intertrip
  - Cat 6 voltage intertrip
  - Focus in Bilateral Agreement to agree commercial terms for intertrip (where applicable) before connection
- Consultation Q2/Q3 2013



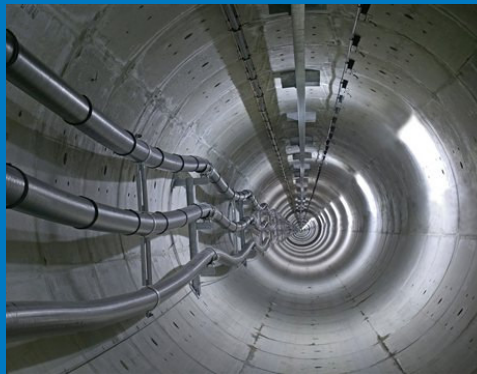
# Electricity Ten Year Statement

---

- Electricity Ten Year Statement (ETYS) covers:
  - Impact of scenarios on the development and operation of the electricity transmission network
  - Network Development Policy (NDP) for England & Wales - defines how we assess the need to progress wider system reinforcements
  
- We would like your feedback on how the ETYS & NDP could be developed:
  - Discuss your views at the table this afternoon
  - Respond to our consultation by 16 May 2013 at <http://www.nationalgrid.com/uk/Electricity/ten-year-statement/consultation/>



## Customers and Stakeholders



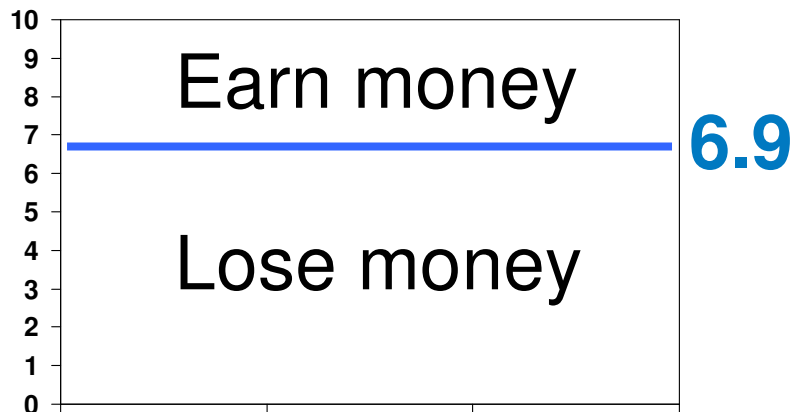
Les Jenkins  
Customer & Stakeholder Engagement Manager

April 2013

## Our New Incentives

### Customer and Stakeholder Satisfaction

- Your views about the services we provide
- Surveys using an independent company



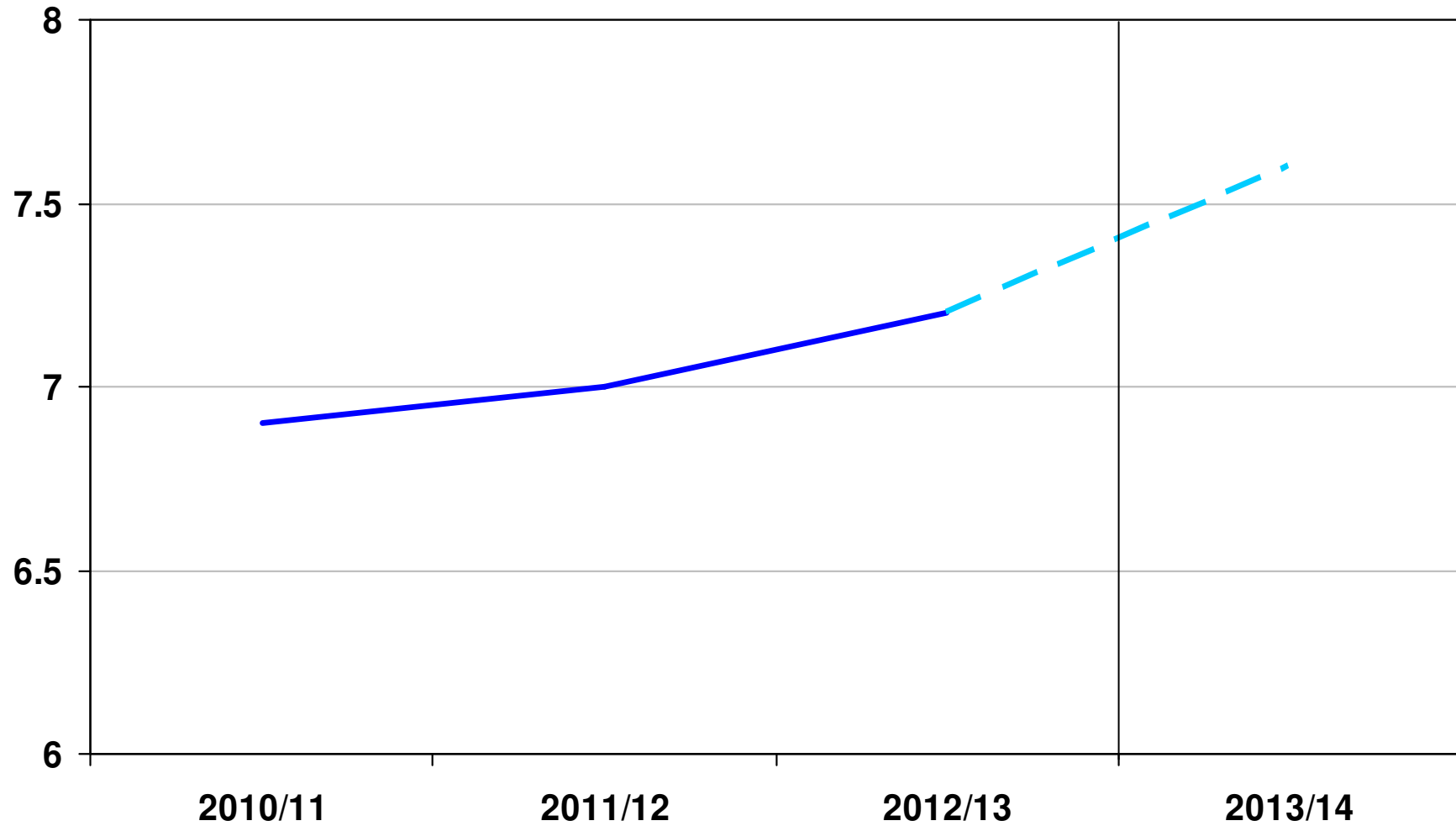
### Stakeholder Engagement

- Reward for exceptional stakeholder engagement
- Annual review by independent panel



# Transmission Customer Satisfaction

---



## Selection of your feedback...

---

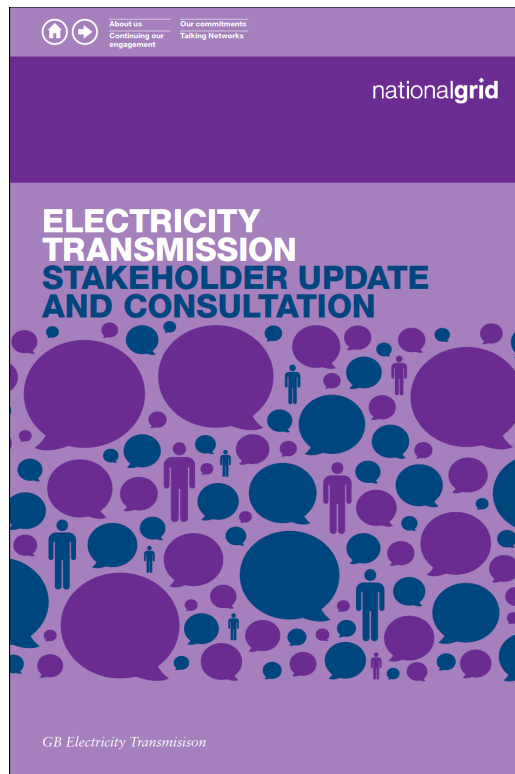
How do you escalate your concerns?

Gaining access to the right person  
and information is difficult

We want a closer more  
collaborative working relationship

Using our website is difficult

# An opportunity to tell us what's important to you



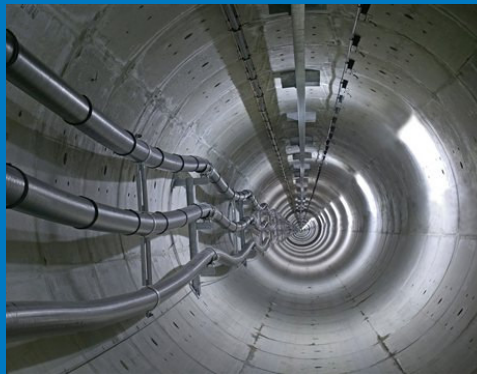
- We've been listening to your views
- This document explains how we are taking your ideas forward
- We'd like to hear more about what is important to you

## A few words from Nick Winser

---



# Electricity Market Reform



James Greenhalgh  
EMR Stakeholder Manager

April 2013



## EMR Developments

---

- Energy Bill
  - First and Second Reading in House of Commons Nov 2012
- National Grid Call for Evidence
  - Closed on 7 January 2013
- DECC EMR Stakeholder Conference 11 February 2013
  - Attended by over 250 industry professionals
- DECC/Ofgem consultation on conflicts and synergies
- Intention for SoS to direct Elexon as Settlement agent

## Call for Evidence

---

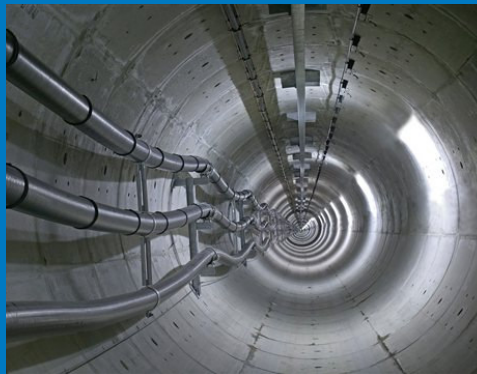
- Development of cost curves by technology
- Data submission
  - Closed for responses 7 January 2013
  - Approx 50 responses
- Review RO data from 2016/17
- Discover CfD investment decisions
  - E.g. Hurdle rate reductions expected for projects with CfDs
- Data Validation (Baringa)
- Report to DECC by end March 2013

## EMR Roundtable Surgeries

---

- Overview and changes since the last customer seminars
  - Delivery Plan Process
  - Contracts for Difference
  - Capacity Mechanism
  
- Discussion on what your business needs from the EMR Delivery Body during implementation and operation

## Charging & Access Developments



Patrick Hynes  
Electricity and Charging Access Development Manager

April 2013

## Developments in Transmission Charging (1)

---

- CMP213 (CUSC proposals linked to Project TransmiT)
- Forecasting BSUoS & TNUoS
  - CMP206, forecast year ahead tariffs 4 times a year
  - CMP208, Provide BSUoS monthly updates
- Removing BSUoS from Interconnectors
  - CMP202, driven by 'Third Package'
- Removing BSUoS from Generation
  - CMP201, competition in European wholesale market

## Developments in Transmission Charging (2)

---

- Capping TNUoS tariff changes
  - CMP207, Rejected
- Implementing charging parameter changes
  - CMP214, Rejected
  - Reviewing frequency of updates and notice periods
- Treatment of 'one-offs' for infrastructure
  - CMP203, avoids potential double counting
- User supplied forecast for net exports
  - CMP209/10 – Ofgem impact assessment

## Potential New Developments

---

- Integrated offshore
  - Informal workgroup to establish principles
  - Considering proposals and when to take forward
- G/D split
  - Reviewing compliance with European legislation
- Treatment of embedded generation
  - Linked to C13, reviewing embedded benefits
- User Commitment
  - Review feedback from first year of CMP192
  - Identified a number of minor changes (updated guidance)

# CMP213

---

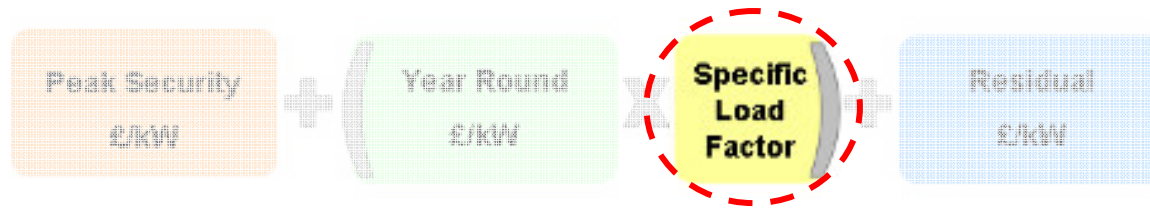
Sharing

HVDC

Islands

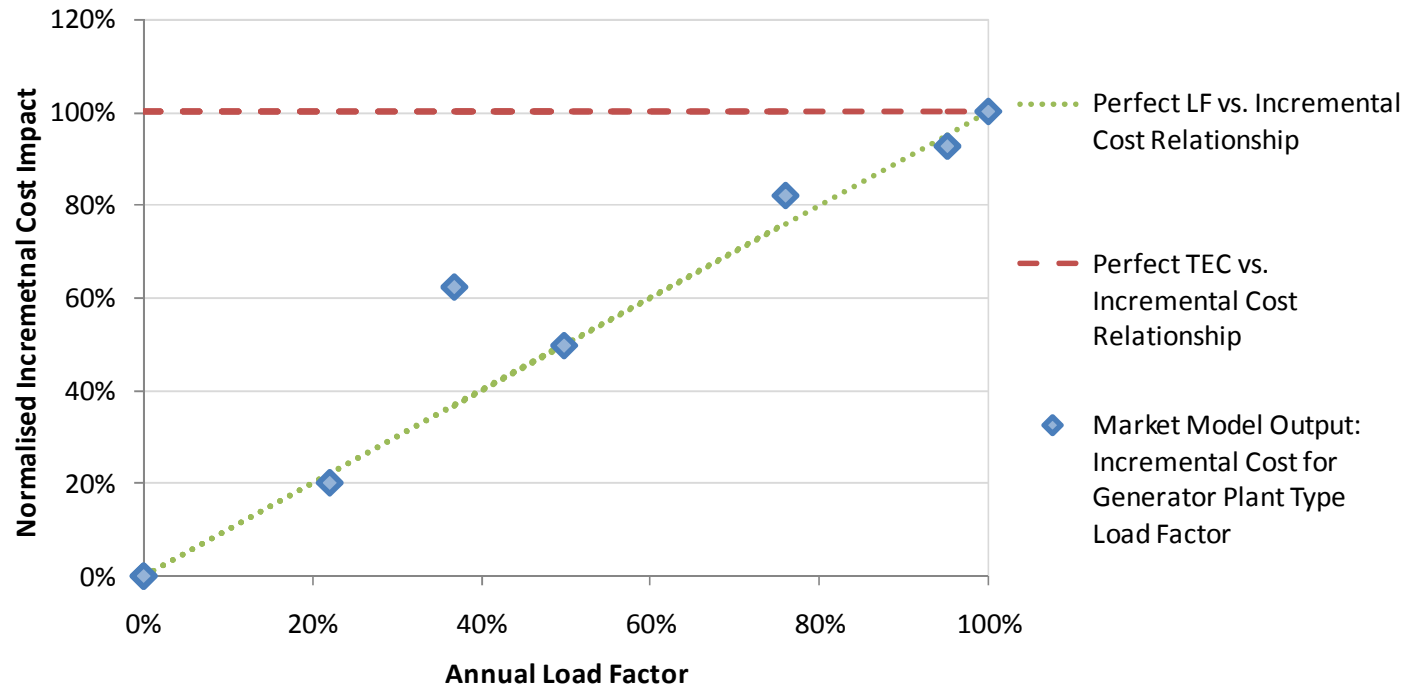


# Sharing – Original Proposal (load factor)

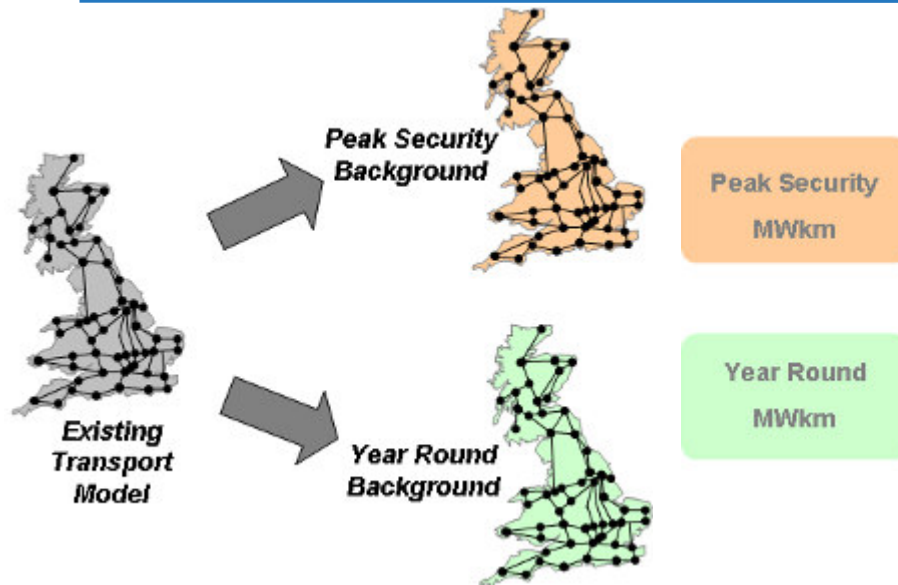


- Many characteristics contribute to network costs

Market Model Outputs vs. Theoretical Perfect Relationships



# Sharing – Original Proposal



- Dual backgrounds in the Transport Model – SQSS

- Generator specific load factor multiplier for year round

Conventional Tariff =



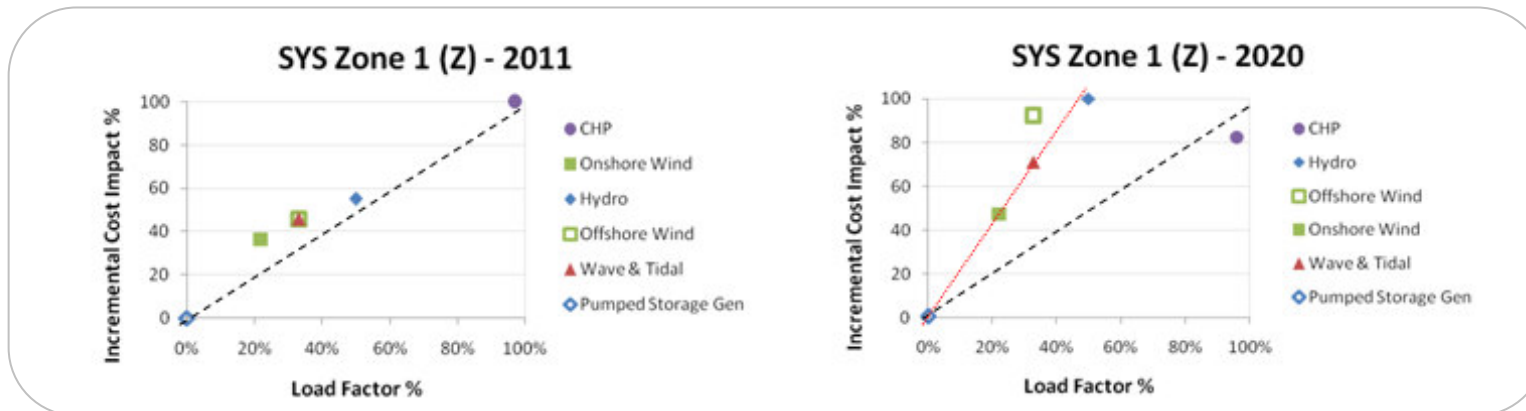
Intermittent Tariff =



## Sharing – Workgroup Developments

### ■ Diversity

- Concern over load factor relationship in areas dominated by low carbon generation
- Diversity alternatives limit application of load factor to tariffs



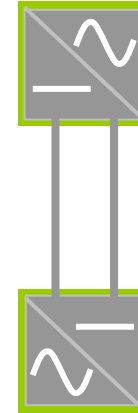
### ■ Load Factor

- Development of user forecast alternative

## HVDC – Original Proposal

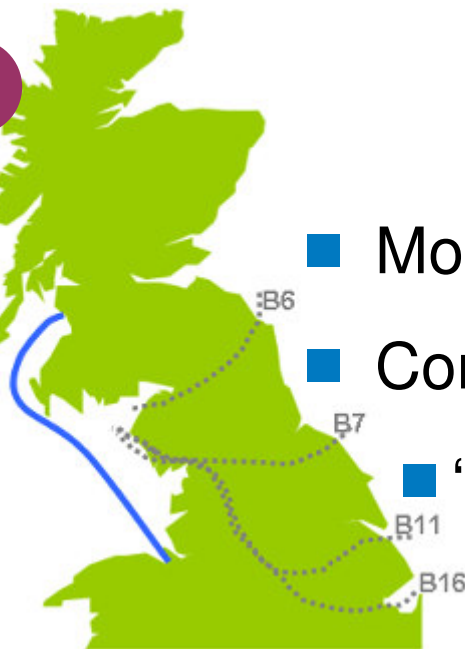
1

- Unit capital cost (£/MW.km.yr) specific and includes full cable / converter costs



2

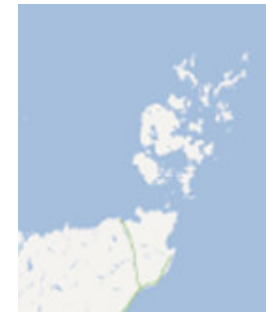
- Model HVDC as pseudo-AC → need impedance
- Compare capacities for parallel boundaries
- 'X' to give pro rata flow



## Islands – Original Proposal

---

- 1
  - Different network technology proposed for each island
  - Technology (Island) specific factors
  - Based on full annuitised capital unit costs
- 2
  - Island connections treated as local – no sharing (built for capacity)
    - Counter Correlation Factor (CCF) - should TOs take account of local sharing



## HVDC / Islands Workgroup Developments

---

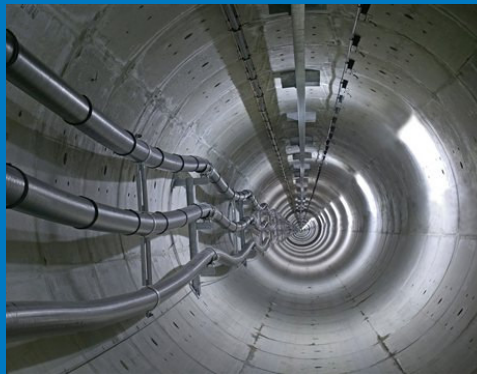
- Remove some converter station costs from the expansion factor calculation:
  - Both : 50 % equivalent to AC substations
  - HVDC : 10% benefits of a Quadrature Booster
  - Islands : 20% benefits of a STATCOMs
  - Both : Generic or Specific

## Next Steps

---

- Code Administrator Consultation
  - 10 April 2013 – 9 May 2013
  - External engagement: TCMF & customer seminars
- CUSC Panel Vote – 31 May 2013
- Ofgem Regulatory Impact Assessment – Summer 2013
- Ofgem decision – Autumn 2013
  - Potential Implementation April 2014 (2015?)

## Grid Code & European Network Codes



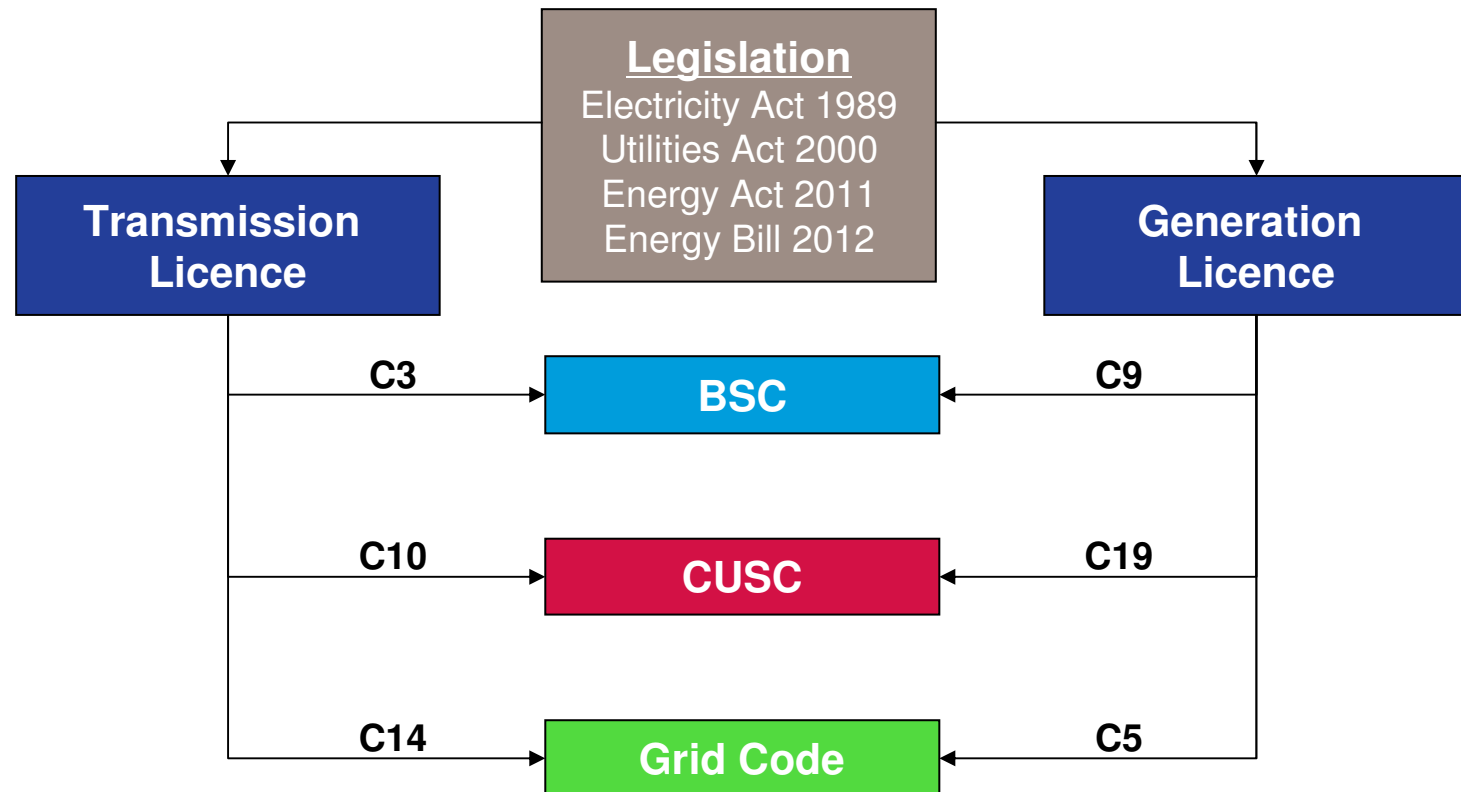
Tom Derry  
Commercial Analyst, Electricity Codes

April 2013



## Legislative Overview

---



## Grid Code – Roundtable Sessions

---

1:00pm to 2:00pm

**Introduction to Grid Code**

**General Discussion**

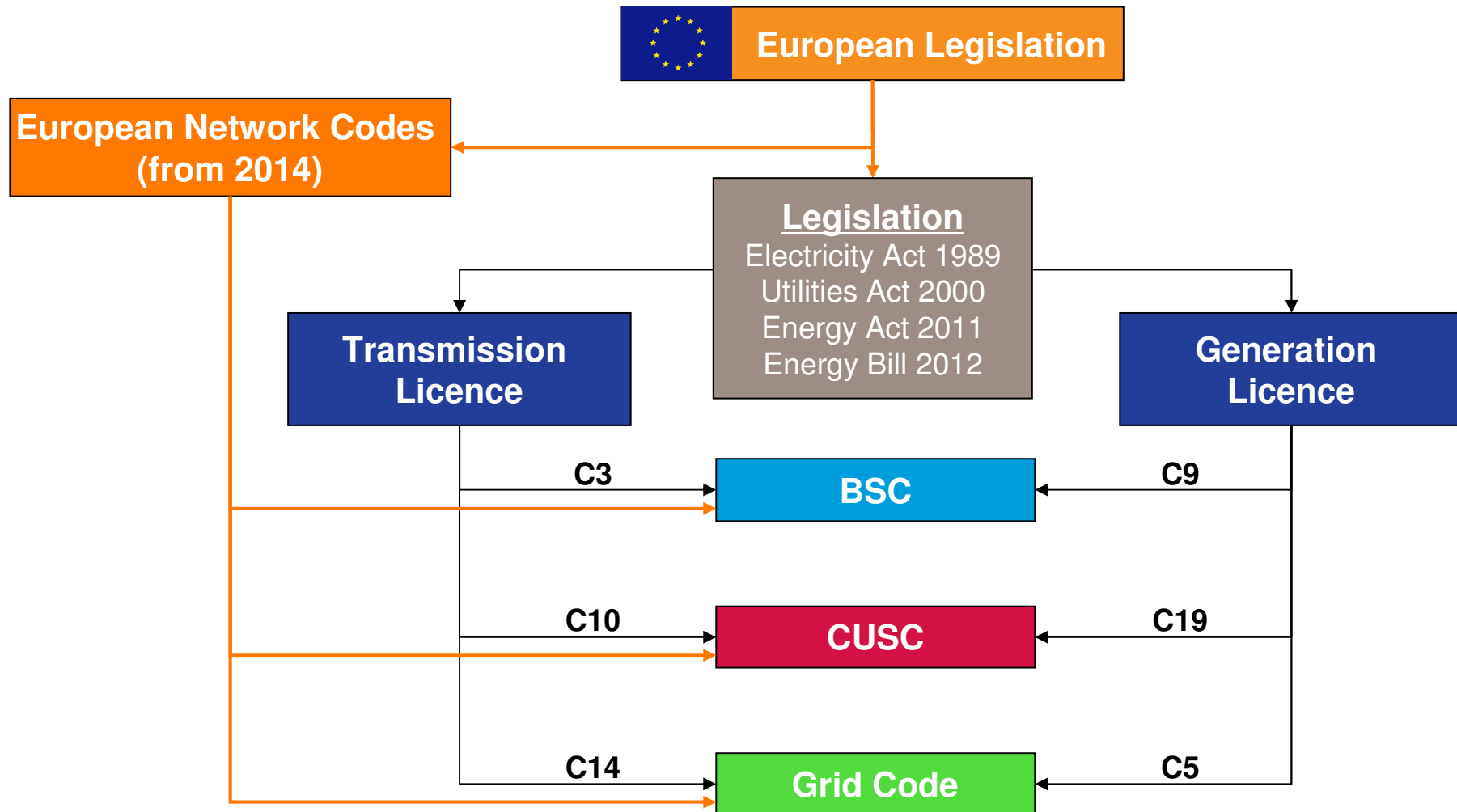
2:15pm to 3:15pm

**General Discussion**

3:30pm – 4:30pm

**General Discussion**

# Legislative Overview



## European Network Codes – Roundtable Sessions

---

### **\*\*European Codes will supersede GB Codes\*\***

- Network Codes become EU Law in ‘by 2014’
- Codes have varying compliance periods (typically 2014-16)

**Need some background about the European Network Codes?**

**What does this mean for me?**

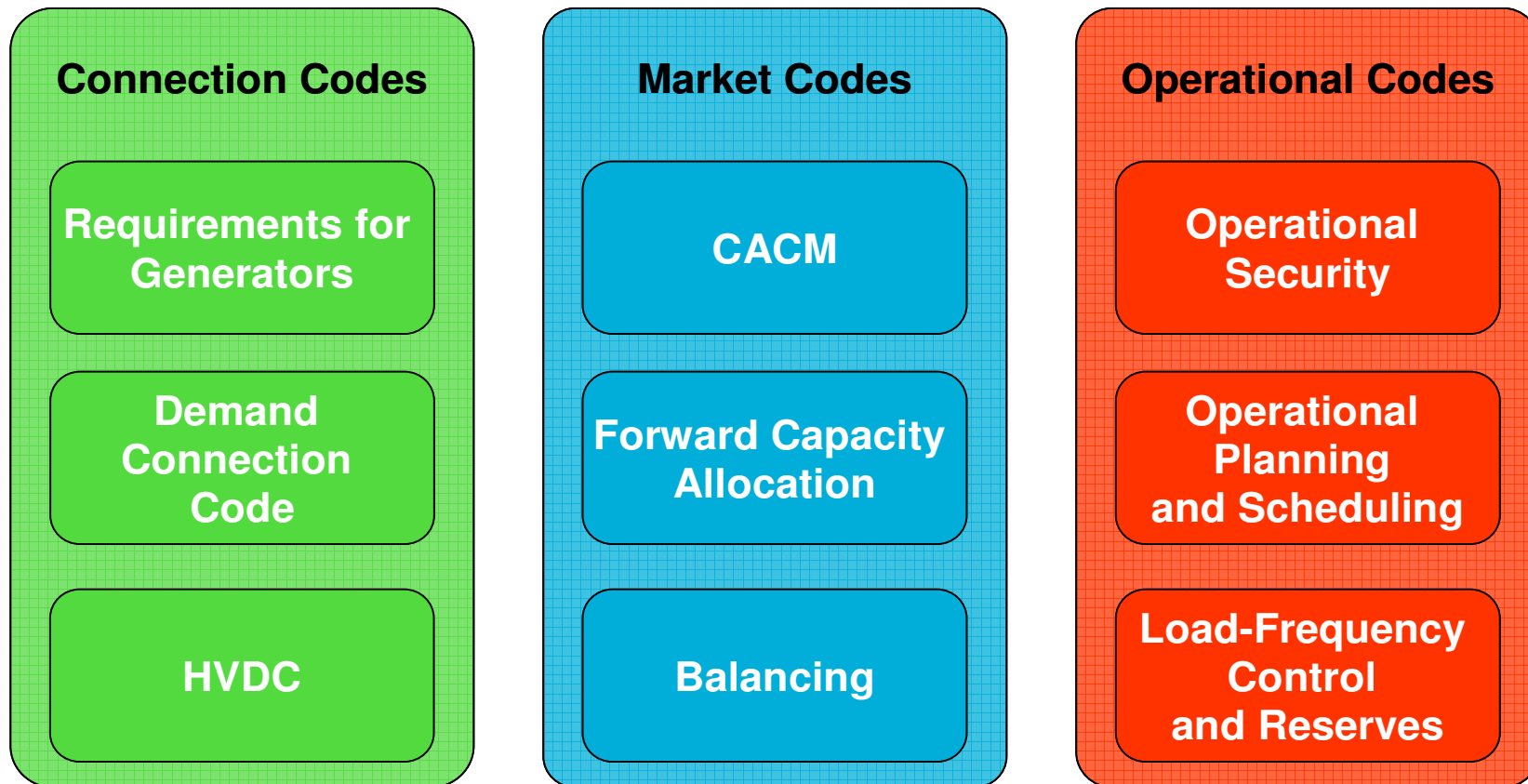
**What are the key challenges?**

**How can I get involved?**

**How are the 9 European Network Codes in development progressing?**

## European Network Codes – Roundtable Sessions

---



## National Grid TO Update



Julian Leslie  
Electricity Customer Manager

April 2013

## National Grid TO Update

---

- Simplification of Connection Agreement Appendix H
- Major Project Update

# Simplification of Appendix H Transmission Reinforcement Works

---

- Transmission Reinforcement Works are currently listed in Appendix H of the Construction Agreement
  - Part 1 – Enabling Works
  - Part 2 – Wider Works
- App H list used for Final Sums
- Following CMP192, secured works are listed:
  - In App MM for Generation
  - In App H Part 1 for Demand and Interconnectors



## Simplification of Appendix H

---

- We are using our Future Energy Scenarios to assess network design
  - Reinforcement schemes are identified in the Electricity Ten Year Statement (ETYS)
  - Scheme timings are shown in ETYS for different scenarios
  - Optimum timings are also shown separately based on Network Development Policy (NDP) cost benefit analysis
  - ETYS holds the latest list of wider works
- In future offers, we intend to identify wider works in E&W by referring instead to the relevant system zone in ETYS
  - Implementation date to be confirmed

## Simplification of Appendix H

---

- Points to note:
  - This proposed change is consistent with Connect & Manage, and...
  - ...we are considering how this could also apply to 'Invest & Connect' Offers and those with non-firm arrangements
  - Wider works in Scotland will continue to be listed as provided by the relevant TO

## Major Project Update

---

- [Illustrative Connection Timescales Map]

## Grid Operations in 2020



Julian Leslie  
Electricity Customer Manager

April 2013

## GO2020 Assumptions

---

- 25-30GW of wind, mainly Offshore and Transmission connected
- Existing stations lose load factor and many close (Large Combustion Plant Directive)
- Gas is used in preference to coal
- CCGTs and variable gas imports drive volatility for gas
- More electricity interconnections to Europe
- Development of European Codes
- Plan for:
  - Smart Meters
  - Modest moves to electrify transport and heat
  - Introduction of new technologies

## So what's the problem?

---

- Avoid constraining renewable generation (mainly wind)
- Volatility/Uncertainty for electricity and gas
- Economics of meeting the peak
- Reduced energy storage as coal stations close
- Reduced levels of Synchronous Generation on the System
- New Technology: e.g. Series Compensation
- Complexity/Uncertainty – optimising new control devices, e.g. Quad Boosters

## Avoid Constraining Renewables

---

- Need Reserve in case less wind than forecast
  - Improved forecasting reduces need
  - Carrying reserve on part loaded CCGT erodes headroom
  - Reserve that does not use up headroom:
    - Interconnectors
    - Storage
    - Standing Reserve
- Reduced System Inertia and 1.8GW Largest Loss
  - Wind/Solar does not currently contribute to system inertia
  - Requirement to widen RoCoF settings

# What you get for £2bn: Pumped Storage vs Interconnector

---

<b>Factor</b>	<b>Pumped Storage</b>	<b>Interconnector</b>
Capacity	1GW Gen or Pump	3.5GW Import or Export
Max Energy Stored/Transferred in 24 hours	5GWh (5 hrs full load: based on Dinorwig)	84GWh
Associated Losses	25% Cycle Losses	2.5% Losses (one way)



## Uncertainty for Gas

---

**Uncertain Wind Generation**

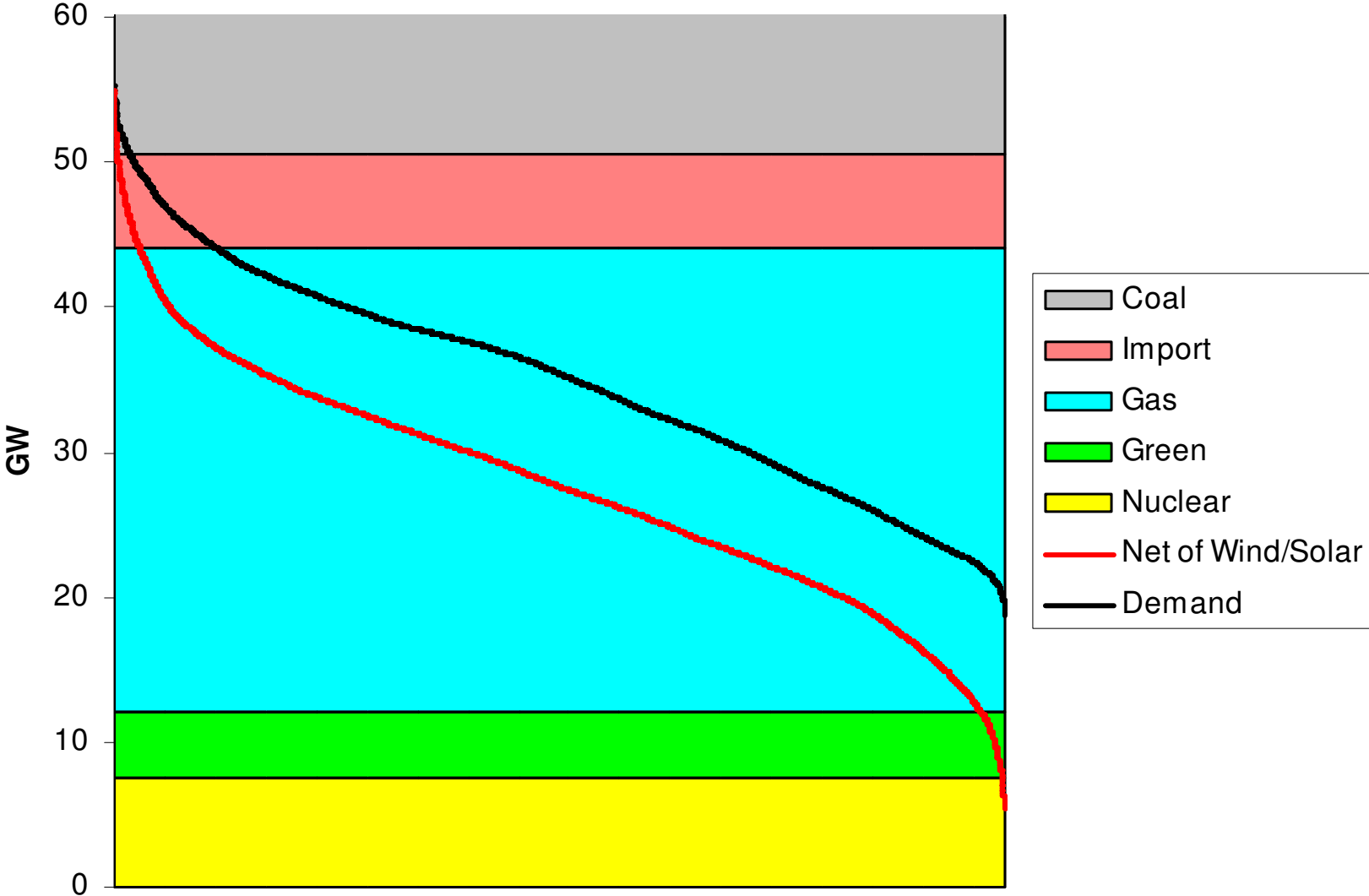
**Uncertain Total CCGT Running**

**Uncertain Allocation to Individual CCGTs**

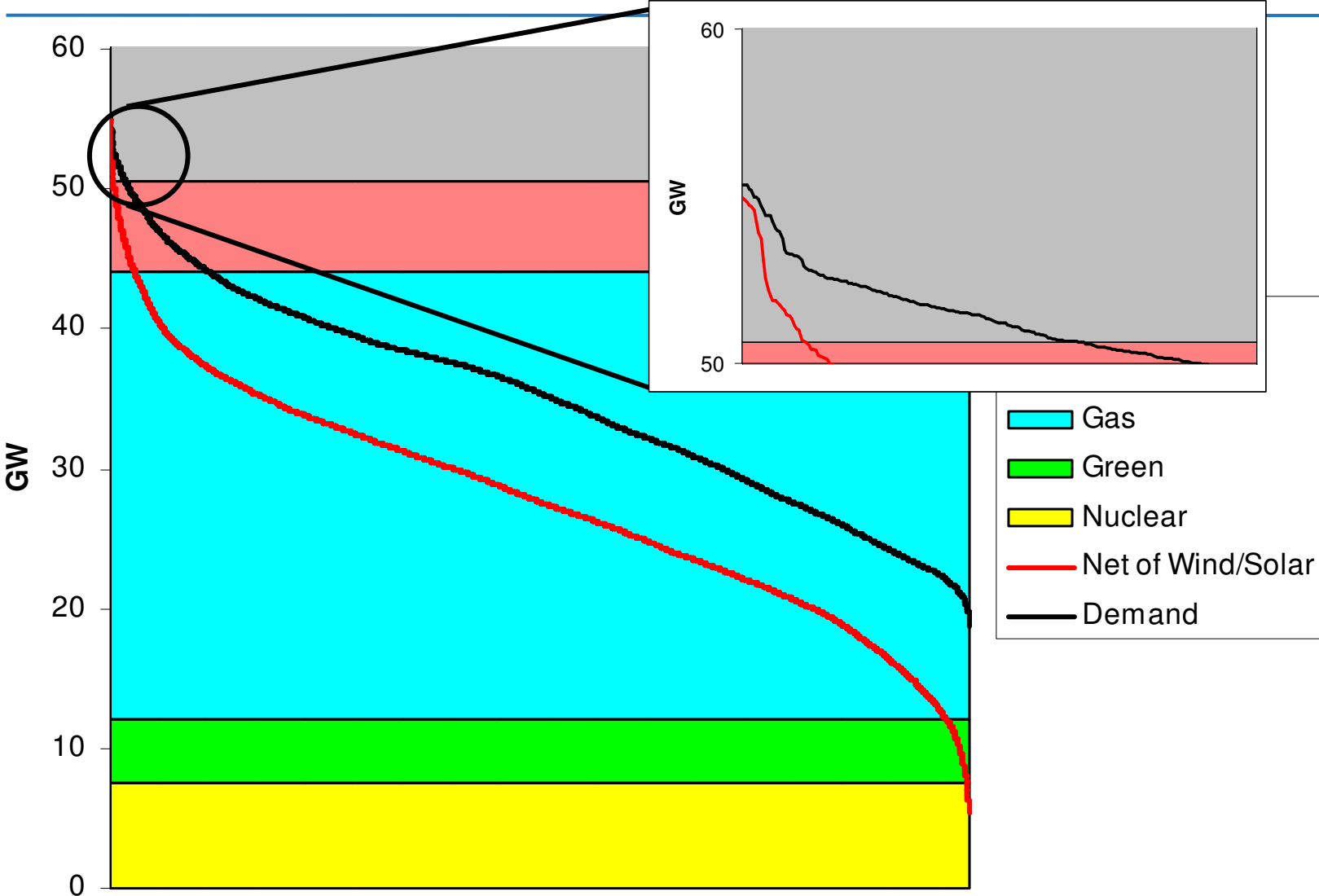
**Uncertain Impact on NTS**

**Uncertain Sources of Gas**

# Meeting the Peak in 2020: Load Duration Curve



# Zooming in on the Peak: Hence EMR



## Energy Storage: Ratcliffe Virtual Gas Store

---



Delivery: 48 GWh/Day

Space: 7.8 TWh

~ 20% of Rough

Half of coal plant closed by 2020

## Conclusions

---

- Wind:
  - Present problem is shortage of transmission
  - Intermittency requires flexibility to respond
  - Gas, as marginal fuel, will also need to be flexible
  - Exporting surplus wind is more promising than storage
  - Load factor of existing fossil generation will fall sharply
- Loss of Coal Storage:
  - Removes flexibility from gas and electricity
  - Risk is severe cold weather with reduced gas imports