SEM Network Code Forum
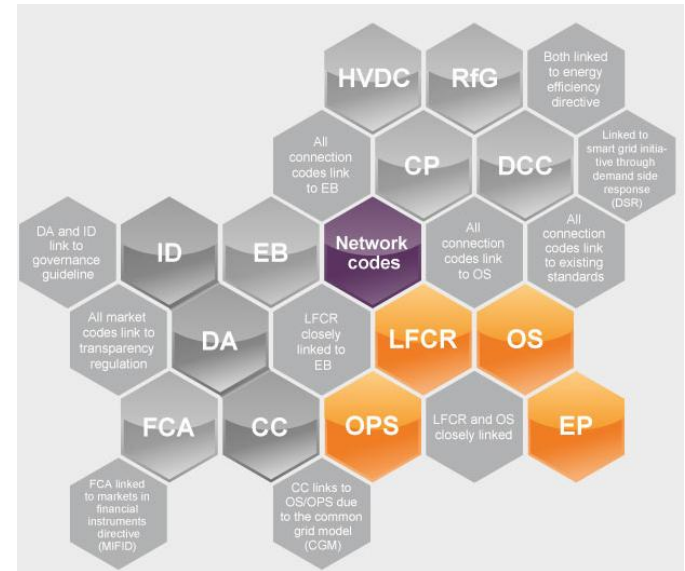## Operational Network Codes

Sam Matthews

1st July 2014

Operational Network Codes

- ## Still waiting on Comitology for OS, OPS, LFCR
  - Internal assessment work on implementing

- ## Network Code Emergency & Restoration
  - Draft code published 14/06/14
  - Public Consultation 09/07/14

http://networkcodes.entsoe.eu/operational-codes/

Operational Network Codes

- Current Activities
  - Synchronous Area Agreement (required by Operational Network codes). Assessing any gaps in EirGrid / SONI. Approach may be to adopt CE Operational Handbook approach

- Regional Security Coordination Initiative (RSCI)
  - may be a requirement to eventually join an RSCI
  - focus on regional rather than synchronous areas

Cross Border Pilot Projects Update

1	CMOs for mFRR and aFRR with real Time Flow Based congestion management
2	Cross-border market for FCR based on TSO-TSO model
3	E-GCC
4	TERRE: Trans-European Replacement Reserves Exchange
5	Development of the Nordic RPM
6	Cross-border balancing market (between SEPS and MAVIR)
7	Design and evaluation of a harmonised reactive balancing market with cross-border optimisation of FRR while keeping control areas, bid zones, and Regulatory oversight
8	BritNed / TenneT / National Grid Balancing Services
9	IGCC aFRR-Assistance and Flow-Based Congestion Management.

TSOs involved

TSO possible future involvement

SEM Network Code Forum
Network Code
on Electricity Balancing

Conor Kavanagh

1st July 2014

NC Electricity Balancing Timeline

23 December

6 Months	12 Months					3 Months		> 12 Months
Framework Guidelines	Drafting	Internal Approval	Public Consultation	Updating	Internal Approval	ACER Opinion	ENTSO-E resubmits	Comitology Process ....
Scoping	Development					Approval		

7 November

18 March
Board of Regulators
favourable opinion
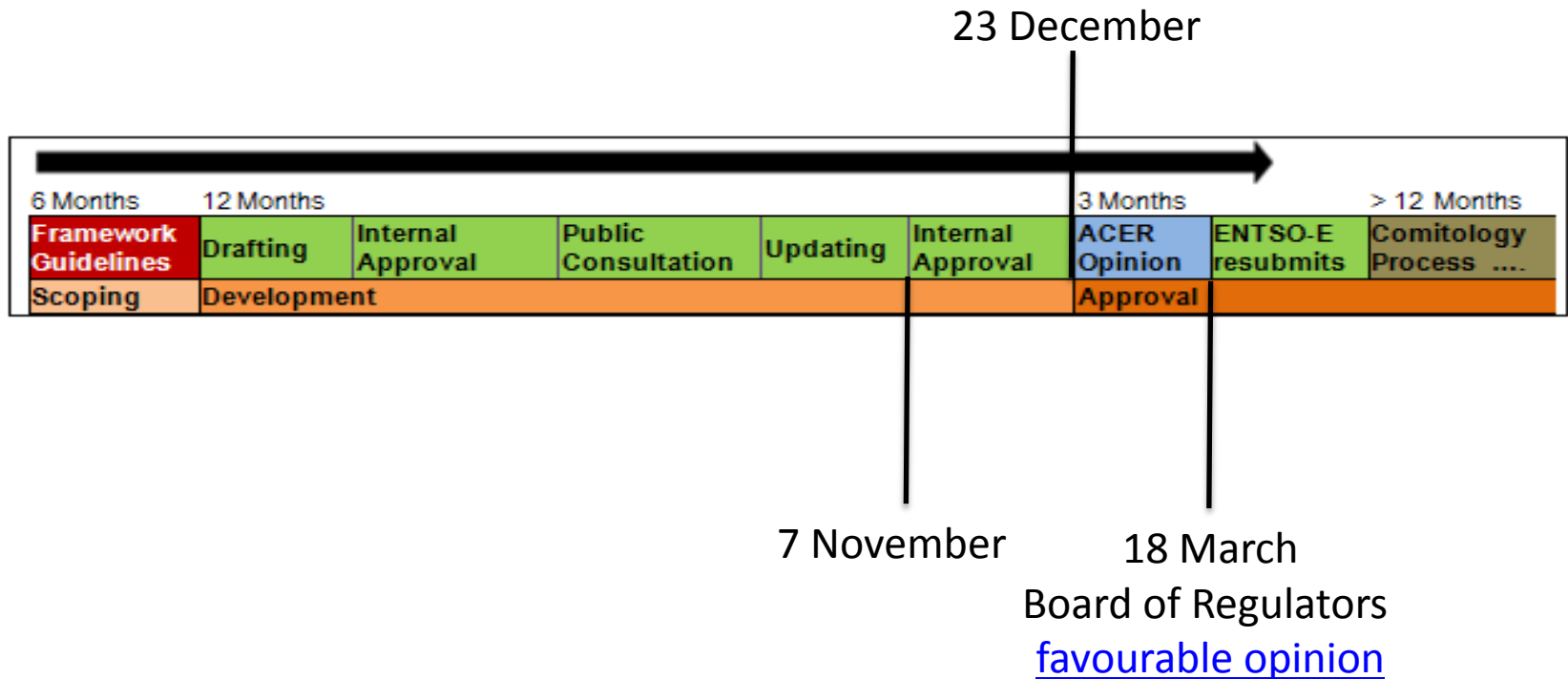
NC on Electricity Balancing SEM Updates

SEM perspective:

- NC Forum of 12th June 2013 focussed on NCEB.

- Dedicated workshop on NCEB & NCLFCR held on 1st August 2013.

- NC Forum of 5th September minor update.

- **[Introductory analysis of the NC](#)** published 16th December 2013.

NC on Electricity Balancing Redrafting

ENTSO-E activity:

- ACER opinion structured into 80 issues.

- Approach to redrafting is to address each issue by changing the code to remove all of ACER's specific concerns.

- Changes not possible on a few issues.

- Deviations from ACER opinion brought to ENTSO-E Market Committee to ensure correct approach.

All-island Considerations

a) Synchronous Area Ireland reserve processes & product requirements.
b) Balancing after one hour Cross Zonal Intraday Gate Closure Time
c) All-island commercial & other aspects
d) Balancing in Central Dispatch Systems
e) Priority Dispatch
f) DS3 System Services
g) Ramp Rate Process and product definition with HVDC connection
h) BETTA market, Elexon and National Grid engagement.
i) DSOs coordination.

Implementation Considerations

- Development of Standard Products for the frequency processes.

- Establishment of regional pilot projects.

- Management of various transition milestones contained in the NCEB for Regional Integration Model and European Integration Model.

CACM NC

Comitology Process

- New draft expected ahead of next informal ECBC meeting - last week of July?
- Comitology voting foreseen in Q3-Q4 with text sent to the EP and Council not earlier than Q4

Early Implementation

- ACER feedback on ENTSO-E CCR proposal in early May - DC lines between synchronous areas into one CCR or into existing synchronous CCR
- Selection Process for Bidding Zone Study started

FCA NC

Single Allocation Platform (SAP)

- Clarity needed on the Single Allocation Platform (SAP)
- Establishment of ENTSO-E SAP group for CASC/ CAO Merger

Harmonised Allocation Rules

- Work on HAR principles papers currently underway
- HAR ToR developed
- Call for nominations to HAR drafting team
- "All" TSOs involvement

SEM Network Code Forum
Capacity Calculation &
The Common Grid Model

Charlie McGee

1st July 2014
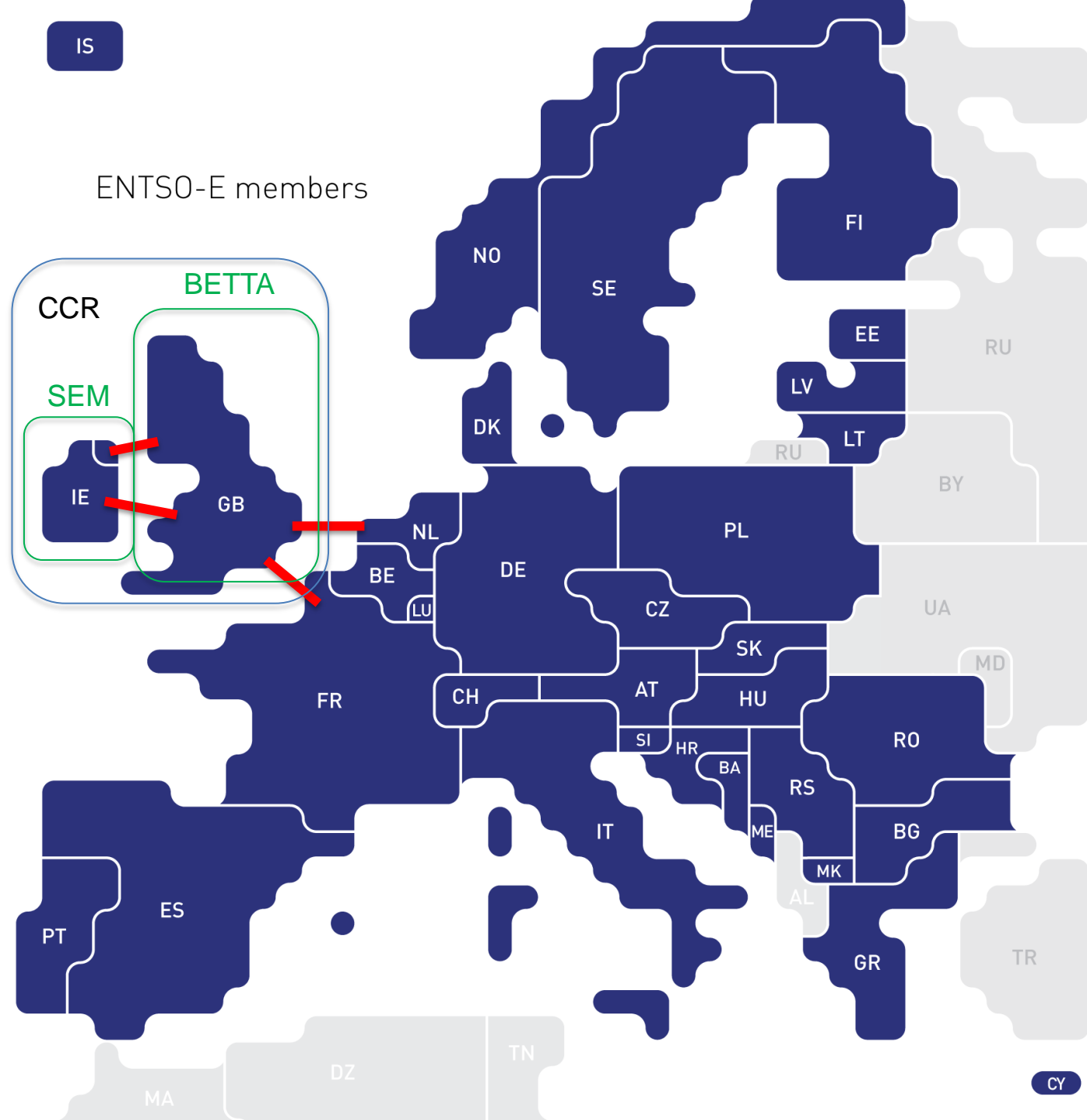
# Cross-Zonal Capacity Calculation

- FUIN Working Group

- Bimonthly meetings

- Cap. Calc. Methodology development

- Common interpretation of codes

ENTSO-E members

IE-NI-GB Capacity Calculation Region

- Working assumption: IE-NI-GB CCR

- Coordinated NTC calculation method proposed

- Coordinated Capacity Calculator TBD

  – Rotate responsibility?
  – Coreso? TSC?

- Benefits & Risks
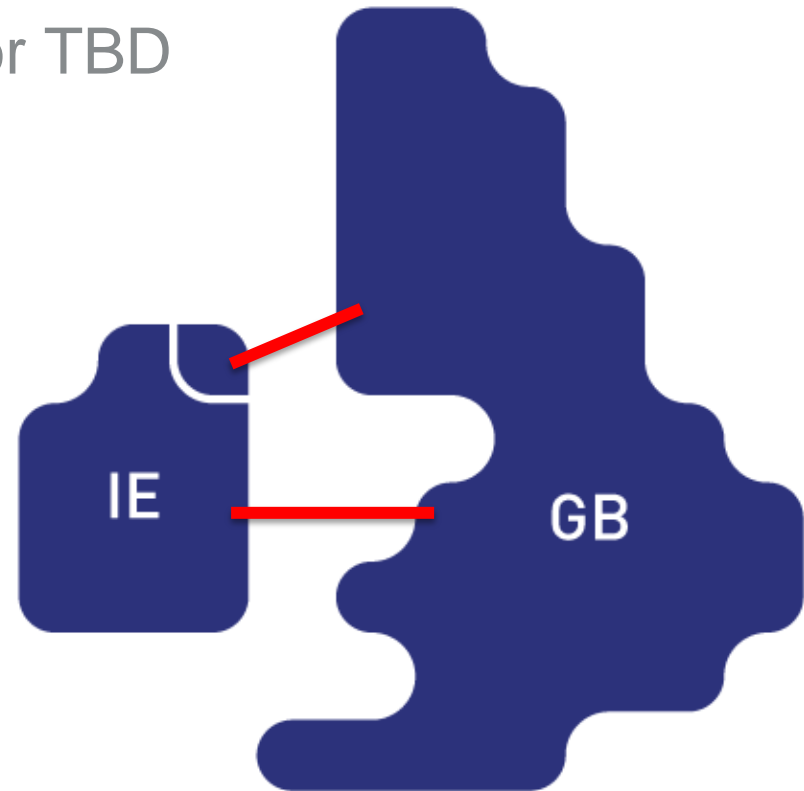
Common Grid Model – EirGrid/SONI

- At least 48 Individual Grid Models legally required to be submitted daily

- Each must represent best forecast of network for each hourly market timestamp

- Must respect 'Net Positions' agreed at European level

- High degree of automation & robust data management required – new IS systems

**Target
End Q3 2016**

Common Grid Model – European Level

- ENTSO-E in process of establishing 'Project Team Common Grid Model'
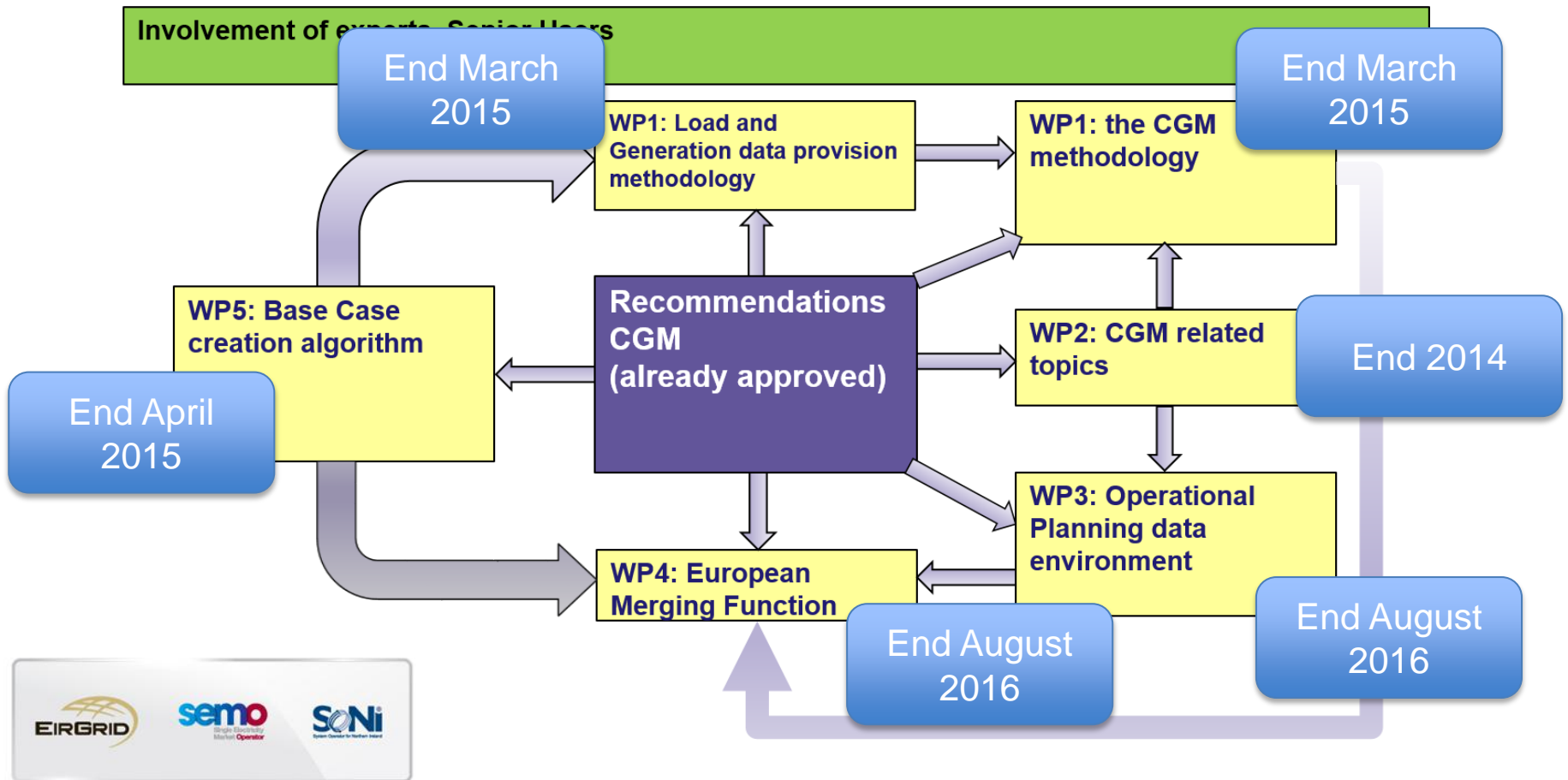
# HVDC Systems and DC connected Power Park Modules covered by NC HVDC

Power Park Module(s) AC collected and DC connected to the main electricity system

HVDC connections between synchronous areas or between control areas including back to back

HVDC connections embedded within one control area

HVDC connections between AC collected PPMs and the main electricity system

Connection Point(s)
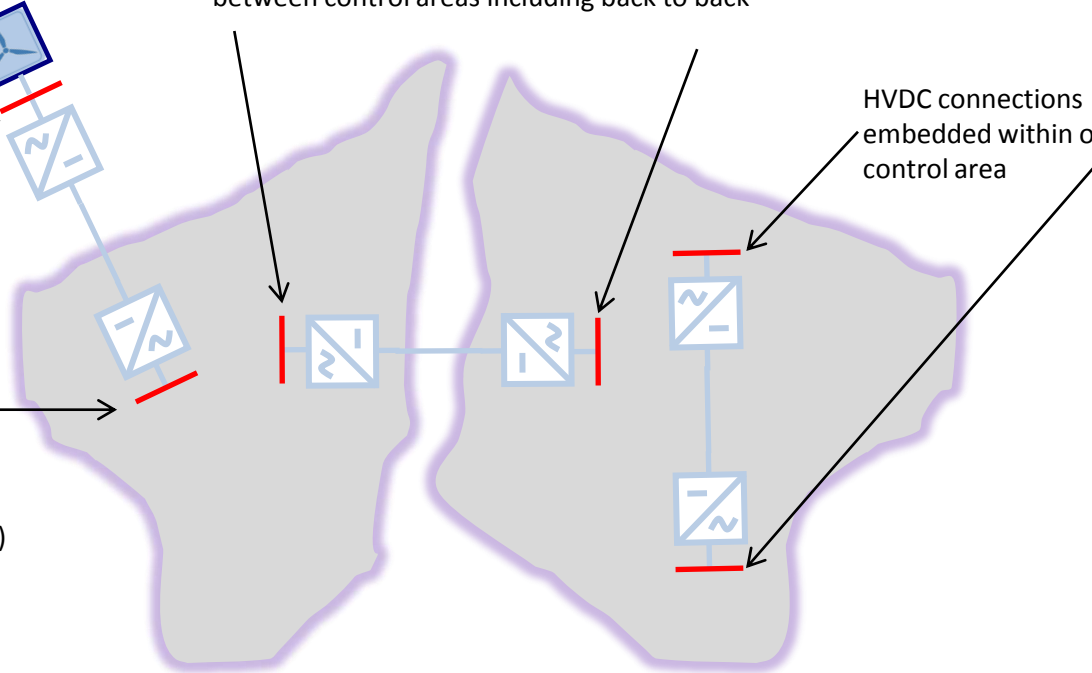
NC HVDC apply for new connections

NC HVDC General Approach

- **Capability of HVDC systems relevant for cross border system security**
    - Use HVDC's inherent capabilities – fast active and reactive power control, supplementary control, …
    - Network integrity as long as generation/demand has to remain connected
    - Increase grid flexibility, capability and controllability
    - Maintain system security

- **DC connected PPMs and associated HVDC connections**
    - Consistently coordinated requirements
    - Consider the long term development of the network

- **Coping with different technologies**
    - Requirements should not favour or discriminate technology

- **Considering potential future DC grids**
    - Requirements for HVDC should not be a barrier to future expansion into multi-terminal or meshed DC grids

- **Coordinated approach between Codes for Network Connections**

Coping with different technologies

- **Objective**
  - Code technology neutral

  - Define the minimum performance requirements

  - Avoiding constraining R&D programs and promote innovative solutions

- **Requirements stated in the NC HVDC**
  - Cover system needs and support security of supply

  - Due to the specific regional/national challenges and choices, it is necessary to leave flexibility to the technical regulation on a national level

    - mandatory and non-mandatory requirements

    - exhaustive and non-exhaustive requirements

  - Emphasize the performance and technology neutrality of HVDC systems

General requirements for HVDC Connections

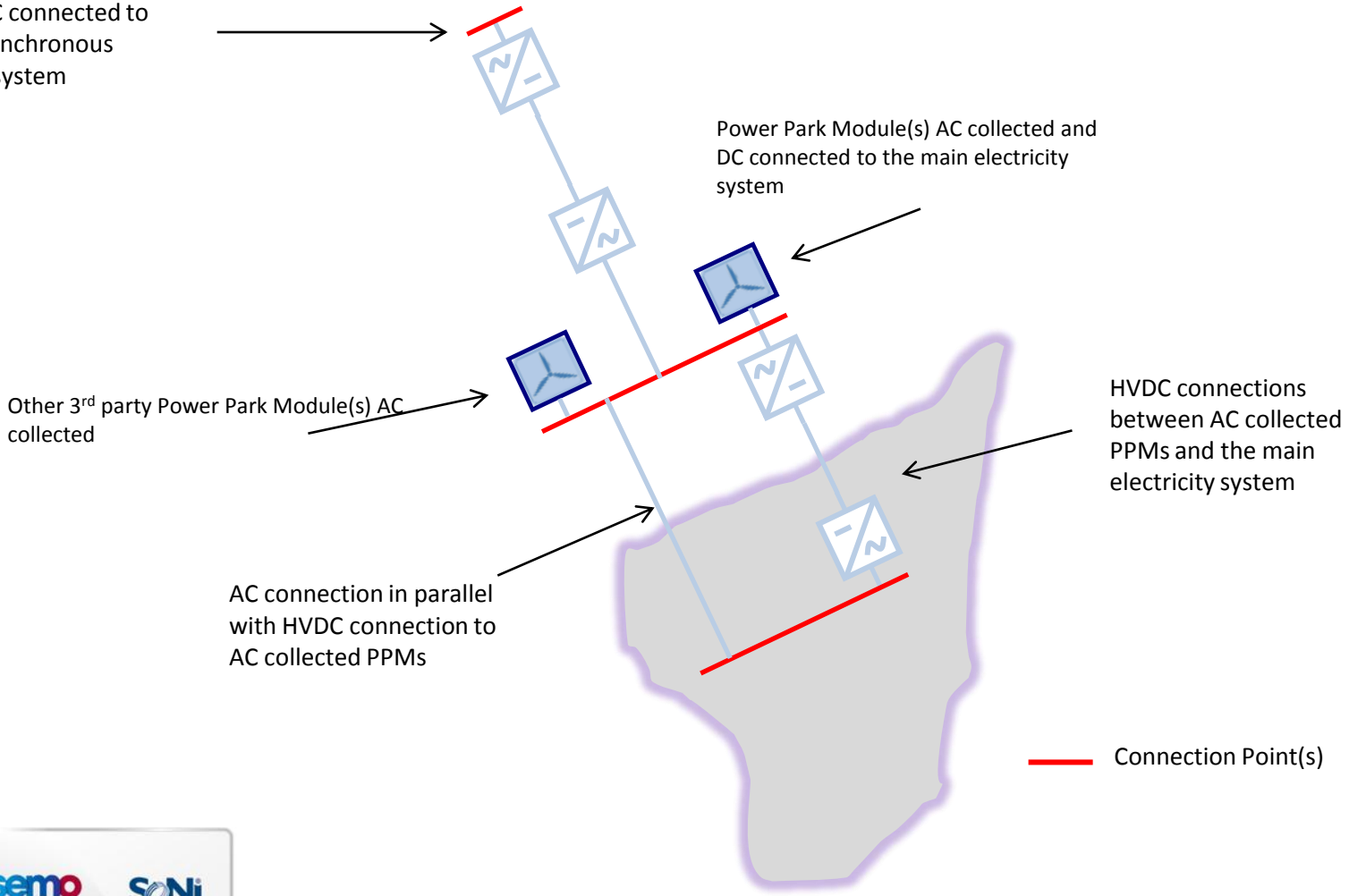| ACTIVE POWER CONTROL AND FREQUENCY SUPPORT	REACTIVE POWER CONTROL AND VOLTAGE SUPPORT	FAULT RIDE THROUGH	CONTROL	PROTECTION DEVICES AND SETTINGS	POWER SYSTEM RESTORATION
Frequency ranges	Voltage ranges	Fault ride through capability	Converter energisation and synchronization	Re-connection	Power system restoration
Rate of change of frequency withstand capability	Short circuit contribution during faults	Post fault active power recovery	Interactions	Electrical protection schemes and settings	Black start
Active power controllability and control range	Reactive power capability	Auto reclosure	POD capability	Priority ranking of protection and control	Isolated network operation
Synthetic inertial capability	Reactive power exchange		SSTI damping capability	Changes to the protection schemes and settings	
Frequency sensitive mode	Reactive power control mode		Network characteristics		
Limited frequency sensitive mode (o/f)	Priority to active or reactive power contribution		System robustness		
Limited frequency sensitive mode (u/f)	Power quality				
Frequency control					
Loss of active power					

DC Connected PPMs and associated HVDC converter configurations

HVDC connections may become DC connected to another synchronous electricity system

Power Park Module(s) AC collected and DC connected to the main electricity system

Other 3rd party Power Park Module(s) AC collected

HVDC connections between AC collected PPMs and the main electricity system

AC connection in parallel with HVDC connection to AC collected PPMs

—— Connection Point(s)

DC Connected PPMs and associated HVDC converter

- NC HVDC uses NC RfG and DCC as starting point. Specific consideration needs to be given to:

    - Frequency ranges
    - Reactive power
    - Voltage support, harmonic distortions and robustness against disturbances
    - Active Power Control

➡ PPM and HVDC System(s) need to have economically consistent, coordinated requirements

➡ Long-term network development needs to be considered, allowing for installing reactive power capabilities at a later stage, and provide a process to optimise the design of the DC link and the PPM

SEM Network Code Forum
JGCWG on Network Codes

David Cashman

1st July 2014

Joint Grid Code Working Group

- JGCWG established to of the NCs on the Grid Codes of Ireland & NI

- Group consists of industry stakeholders from Ireland & NI

- Remit of Group:
  - Impact Assessments of all NCs on GCs
  - Agree and Propose methodology for NC adoption
  - Draft and Propose modifications to GCs to comply with NCs

- Deliverable: To develop revised GCs compliant with the Network Code provisions
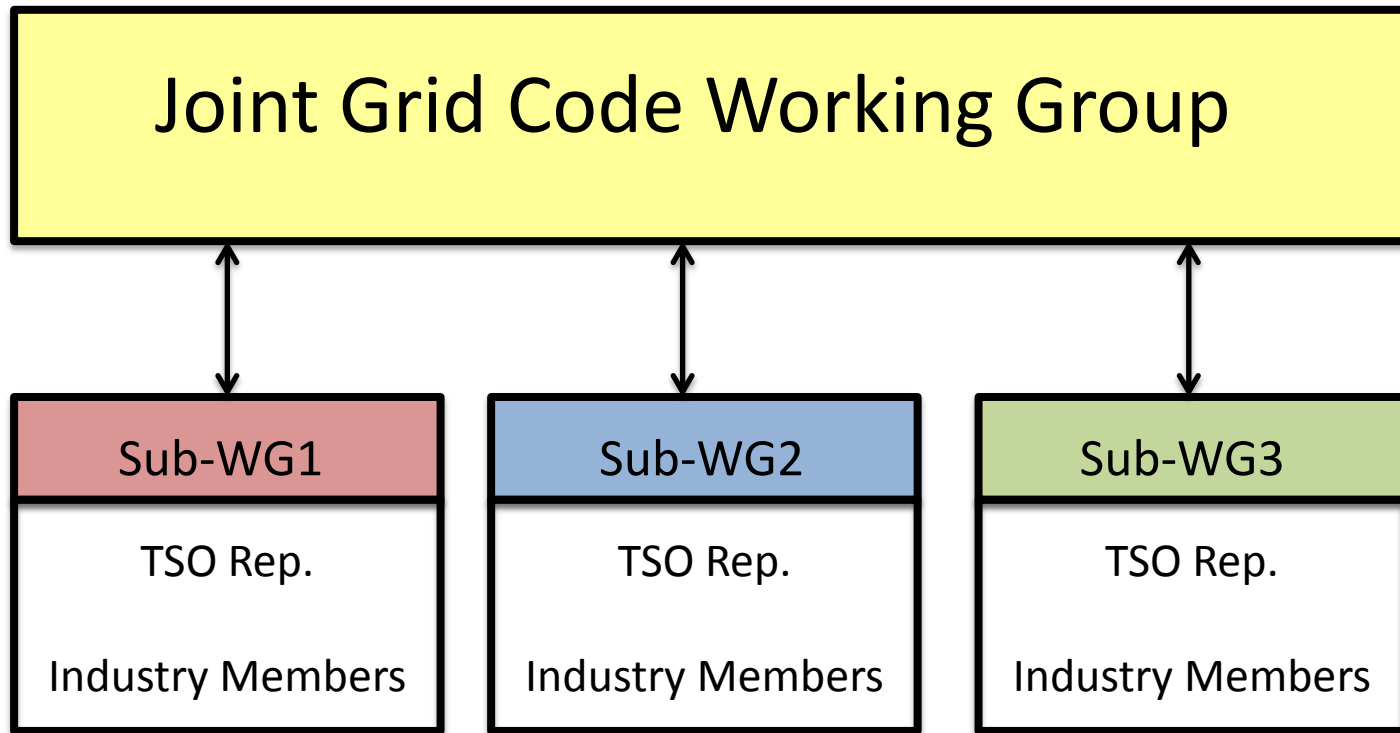
JGCWG Progress to Date

- Initial Impact Assessment was conducted on RfG

- Agreement on Working Group Modus Operandi

- Agreement on Adoption Options for GC structures and adoption methodology
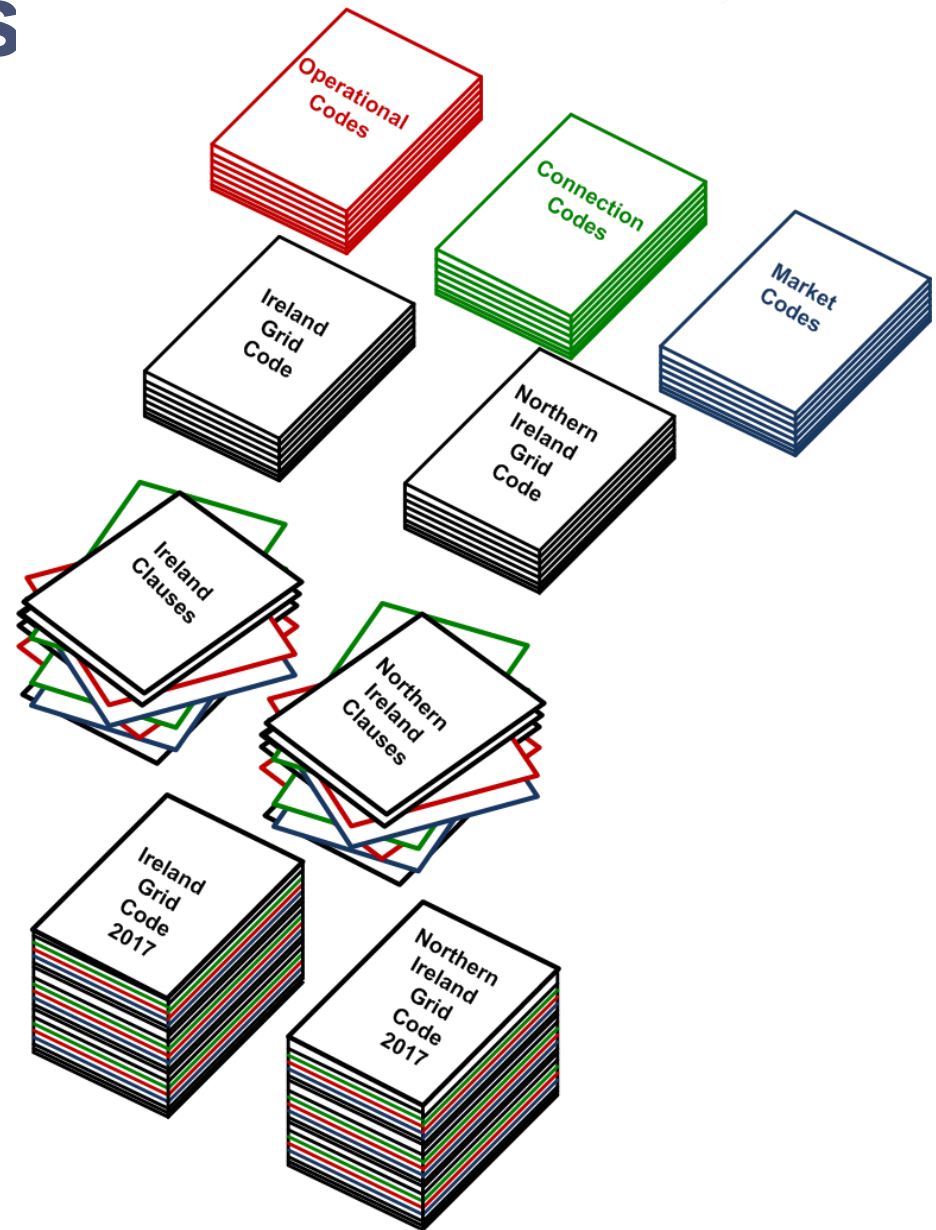
- TSOs recognise that this is a "learning year"

JGCWG Modus Operandi

Adoption Options

- ## Option 1: Maintain Separate Codes

- This option maintains the existing Grid Code structures in Ireland and Northern Ireland. The proposed method for Network Code adoption would be to assess and update each code independently on a clause-by-clause basis.
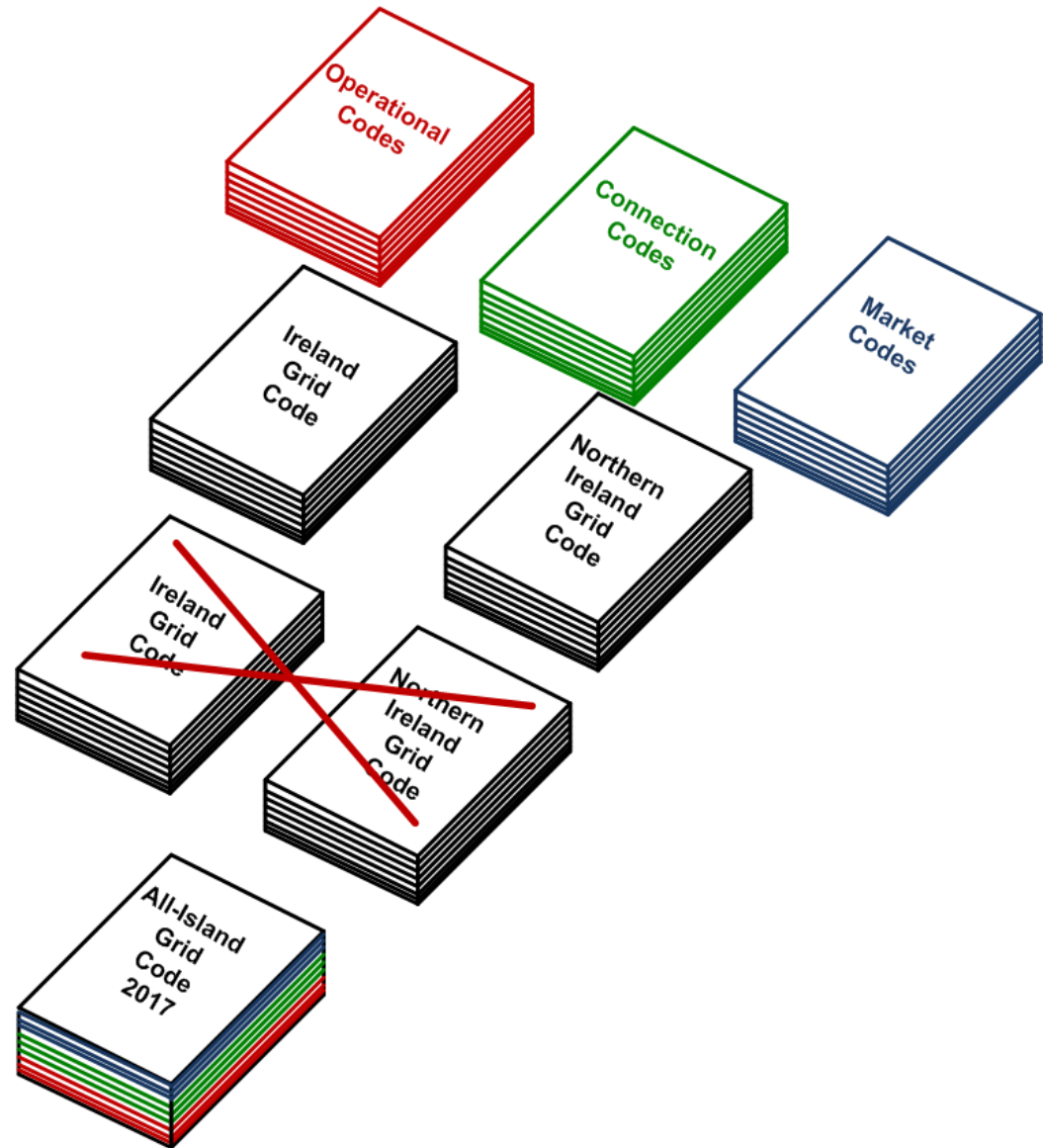
Adoption Options

- Option 2:
  Consistent Codes
  with jurisdictional
  differences

- This method involves developing
  new text for the codes that is
  consistent but with jurisdictional
  differences where required. The
  approach would be conducted on
  a clause-by-clause basis and
  would result in a code that is
  similar to the SDC sections of the
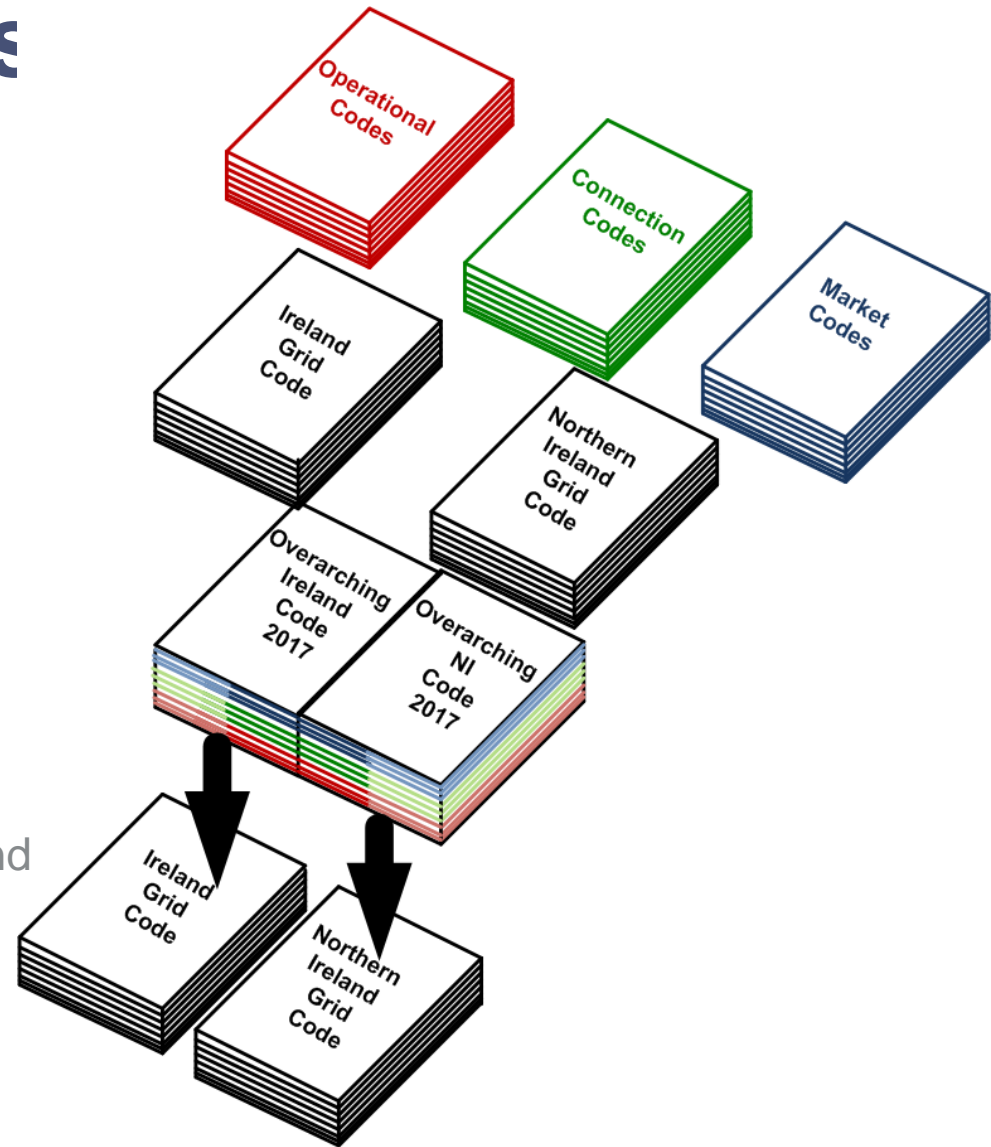 existing Grid Codes.
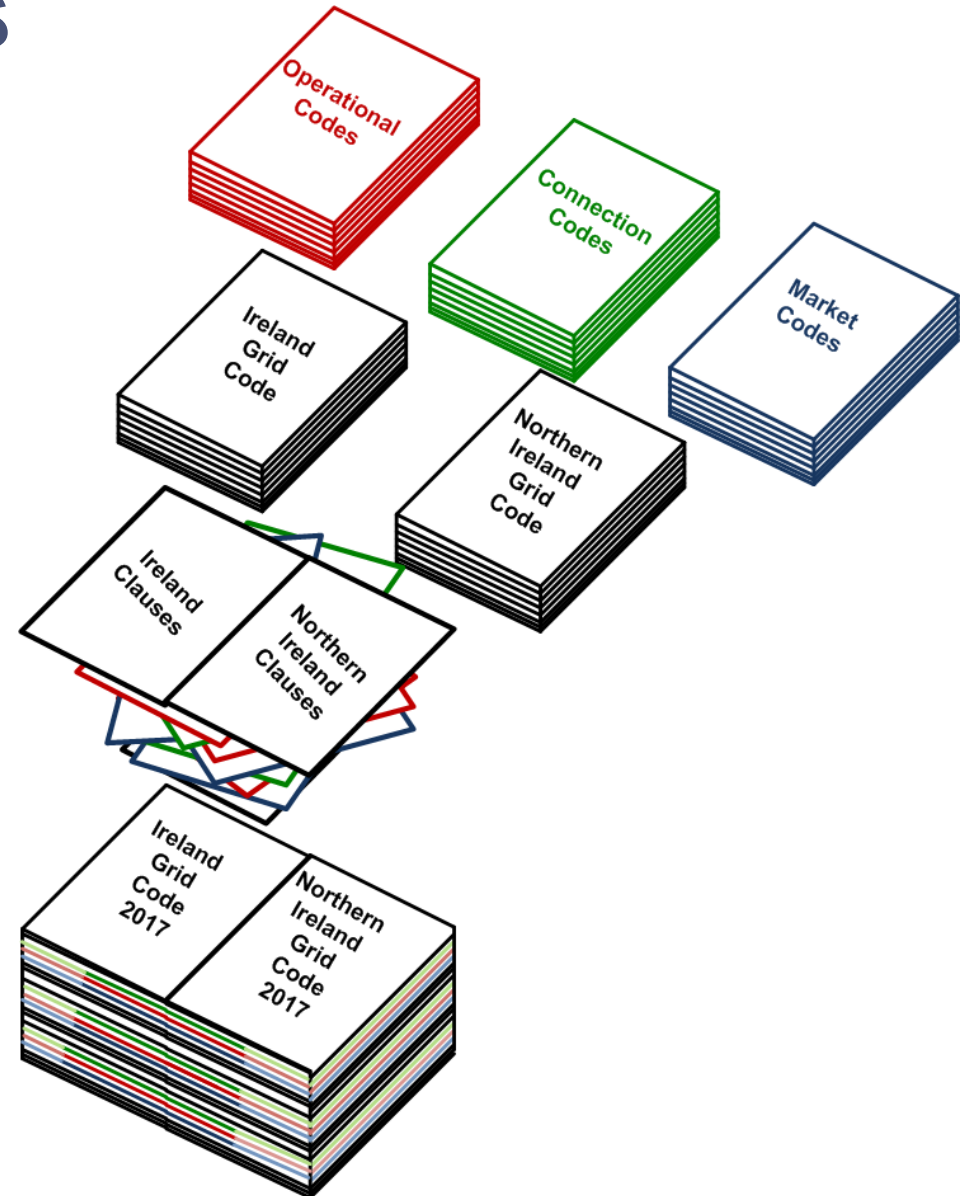
Adoption Options

- Option 3: Develop an All-Island Grid Code

- This option aims to develop a single All-Island Grid Code for Ireland and Northern Ireland. The new code would effectively be created from a 'blank sheet' based on the Network Codes.
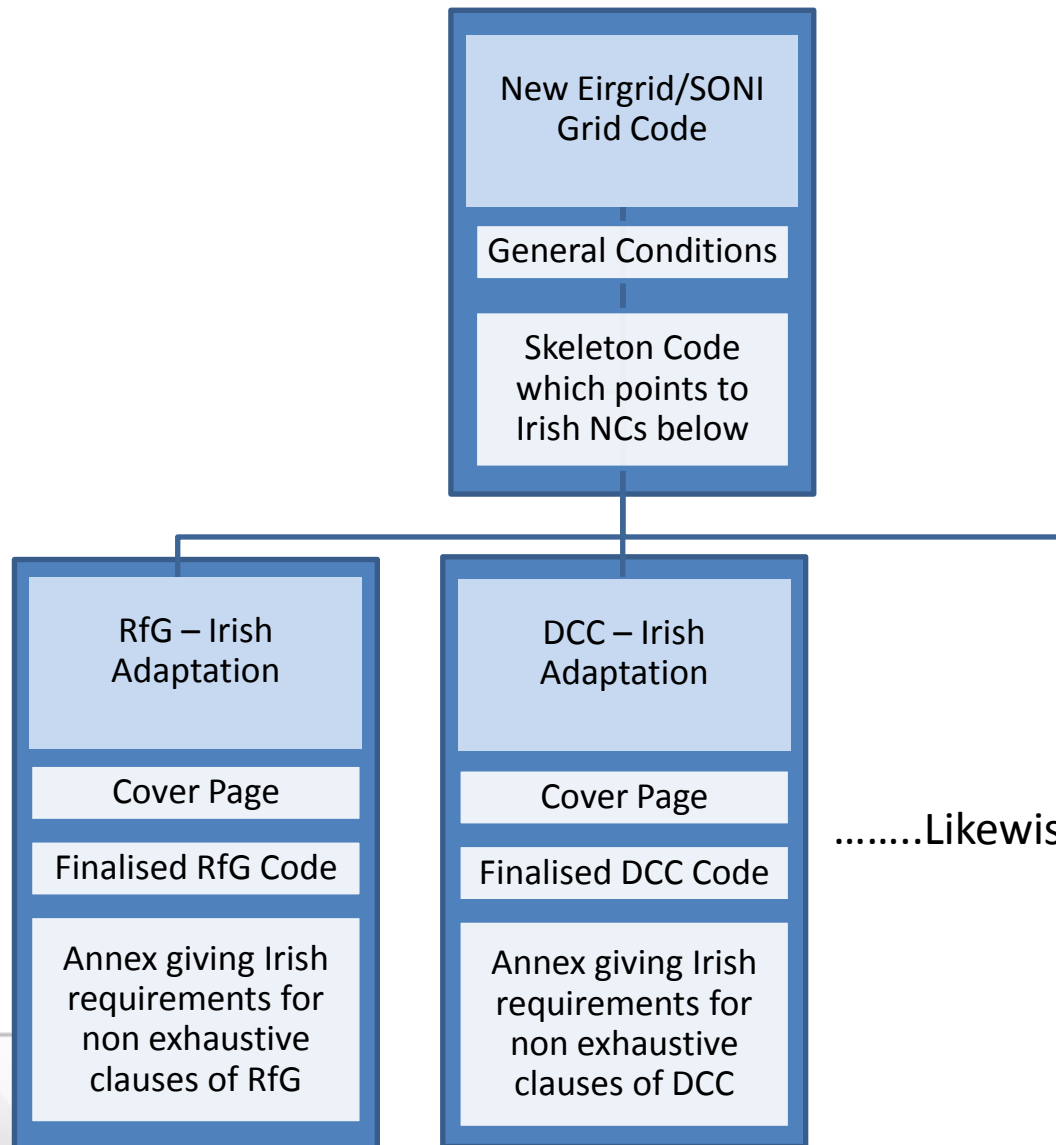
Adoption Options

- Option 4: Overarching Document

  - This method involves freezing the existing codes in Ireland and Northern Ireland and developing an overarching document with jurisdictional differences as required. The document would be constructed from the Network Codes and is updated as each code becomes applicable.

Option 5

New Eirgrid/SONI Grid Code

General Conditions

Skeleton Code which points to Irish NCs below

RfG – Irish Adaptation

Cover Page

Finalised RfG Code

Annex giving Irish requirements for non exhaustive clauses of RfG

DCC – Irish Adaptation

Cover Page

Finalised DCC Code

Annex giving Irish requirements for non exhaustive clauses of DCC

……..Likewise for remaining ENCs

TSOs view on Principles

- The TSOs principles on NC Adoption:
  - transparent and consistent methodology that leads to enduring solution.

  - recognising the nature of the single synchronous area and market but also respecting the differences that exist in both jurisdictions.

  - implement the provisions of the Network Codes in a manner that could provide clear long term benefits in providing consistent and efficient business processes for users in both jurisdictions.

  - Maintain existing technical standards insofar as possible. Only change standards to comply with Network Code provisions.

- Option 4 is favoured by TSOs

- TSOs recognise that this is a "learning year"

Next Steps

- JGCWG to agree Sub-WG participants and remits – July 2014

- Sub-WGs to begin assessing codes and report back to JGCRP – November 2014

- All Network Codes reviewed – Q1 2015

- Begin drafting of Grid Code modifications – Q2 2015