Fundamental Review of the GBSQSS

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2020 Scenario - Gone Green

Plant closures

- 12GW Coal & oil LCPD
- 7.5GW nuclear
- Some gas & additional coal

Plausible but Extremely Challenging

Significant new renewable

- 32 GW wind (21GW offshore & 11GW onshore)
- Some tidal, wave, biomass & solar PV

Significant new non renewable build

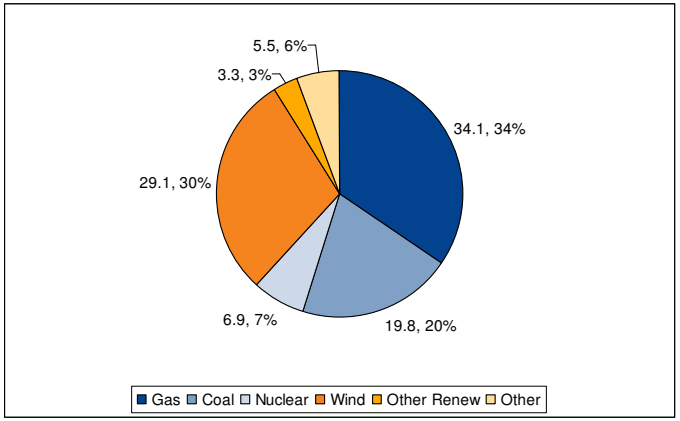
- 3GW of new nuclear
- 3GW of new supercritical coal (some with CCS)
- 11GW of new gas

Renewable share of generation grows from 5% to 36%

Electricity demand remains flat

- Reductions from energy efficiency measures
- Increases from heat pumps & cars

Contribution also required from heat & transport



2020 Target Description	Progress
UK Renewable Energy Target 15% of final energy demand	✓
2050 CO_2 Target on correct 'flight path'	✓
Scottish Renewables Target	✓

Summary

Generation gap caused by closures is filled with wind, augmented by gas & clean coal. Nuclear returns in 2020.

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What is the fundamental review

To develop the GBSQSS so that they work with:

Increased levels of intermittent generation – increased generation margins

Accommodation of next tranche of Nuclear – Increase in infeed & impact on security

Transmission Access Review

Integration of Round 3 Offshore Windfarms (significant increase in size of windfarms)

In so doing review:

The local connections to generation and demand

Review the methodology for planning system reinforcements

The applicability of contingency criteria (N-1, N-2 for thermal, voltage and stability)

The design of offshore transmission systems

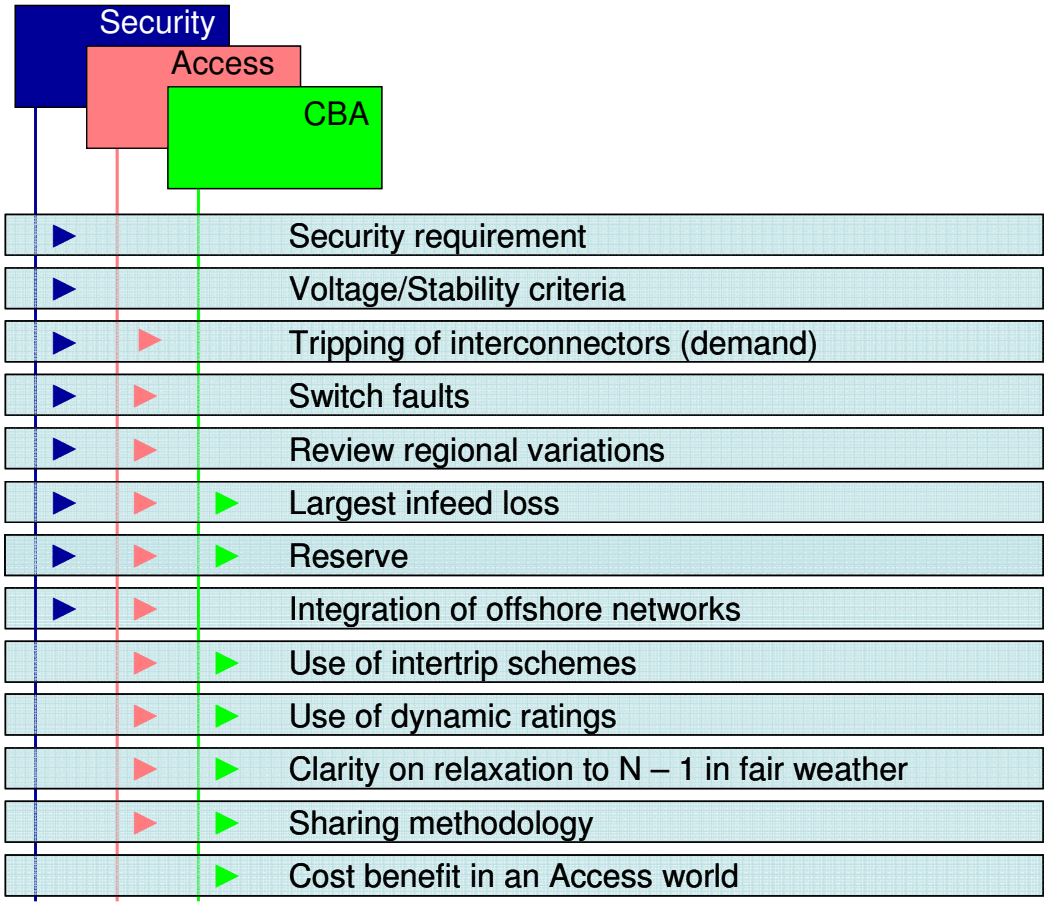
Ensuring that any change to demand security is fully identified and costed.

What's not included -Existing Reviews

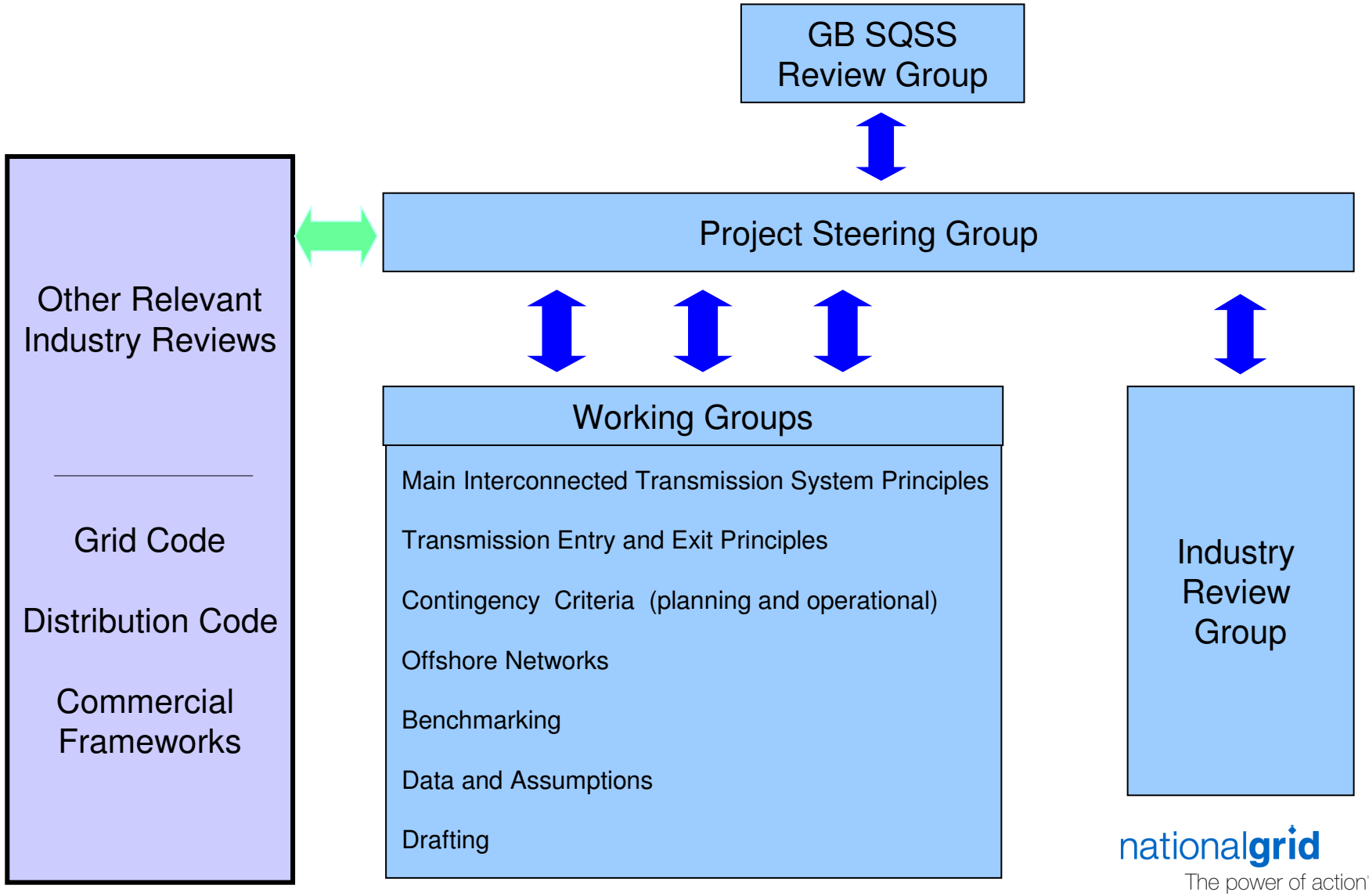
Established reviews will continue in current form and will not form part of the Fundamental Review eg

- GSR 002 Housekeeping
- GSR 003 Local Generation connections
- GSR 007 Review of Infeed Loss Limits

Overview



Project Organisation



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WG 1 International Benchmarking

Objective

To compare what takes place in the UK with that taking place internationally

To identify novel solutions that would have benefit in being applied to the GB system

Responses from

RTE – France, National Grid – USA, Tohoku – Japan,

Eirgrid – Ireland, Elia – Belgium, Tranzpower – New Zealand,

Red Electrica – Spain, Transelec Chile

Report planned for end of March

WG 1 International Benchmarking

Comparison

Contingency criteria n-1 with some n-2:

- Need to understand if this difference is a function of equipment design, assessment of risk of failure or different demand security's
  - For example in Spain generation connectees do not receive constraint payments as a result of transmission congestion

Varies approaches – initial understanding

New Zealand – Different criteria on different parts of the grid system

Belgium – Under intact conditions no constraints on renewables, under n-1 renewables only receive constraint payments if constrained below 60%, 50% or 40% (Winter, spring/autumn, summer)

France – using probabilistic scenario analysis to justify reinforcements

One of today's is about getting a better understanding of these different approaches.

WG 2 Transmission Entry Exit

Entry – Developing a set of criteria, based on cost benefit based assessment, to determine the deterministic generation connection criteria

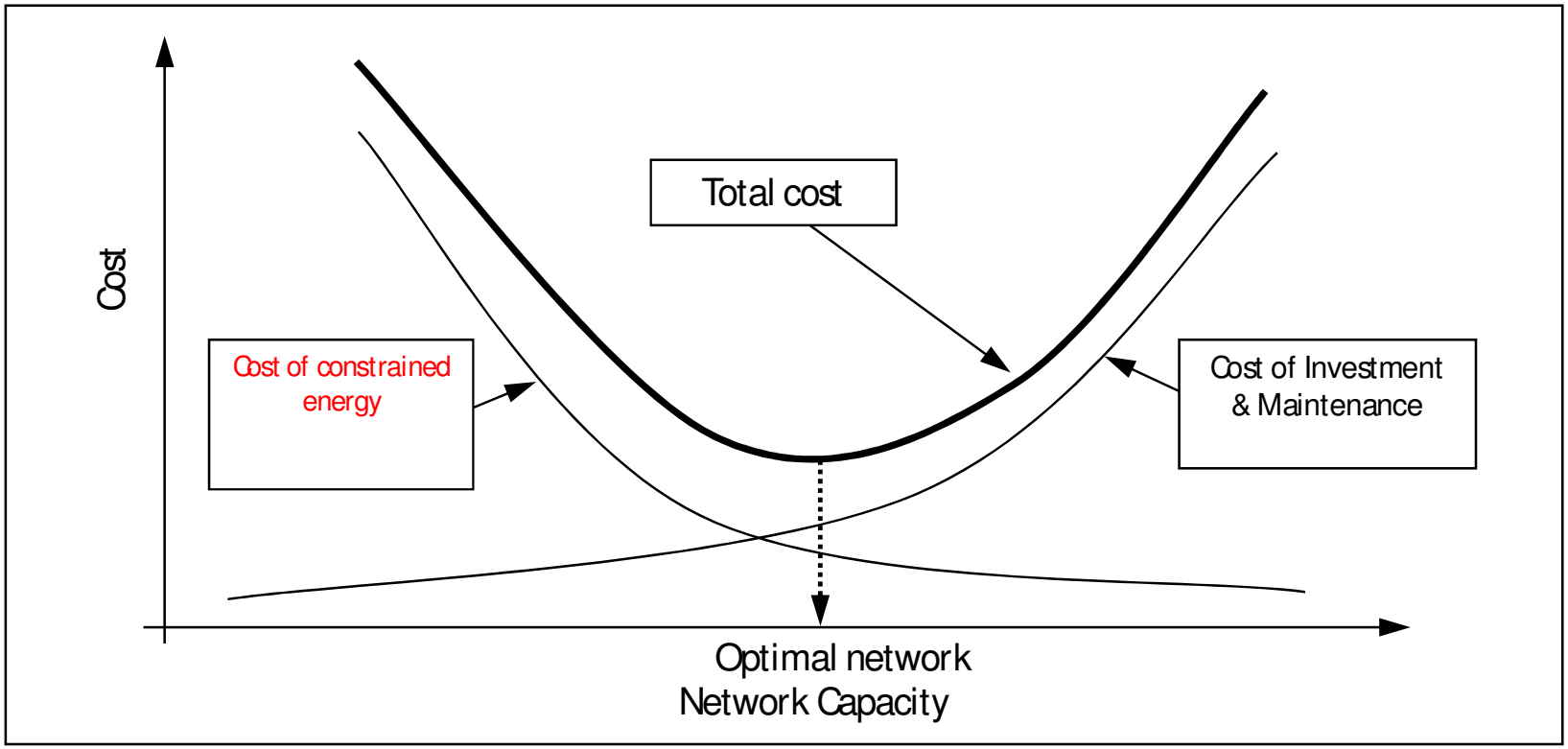
Determine a table – along the lines of P2/6 table (DNO demand security) – specifying generation connection requirements

Exit - Align text with P2/6

Improve clarity on the treatment of embedded generation contribution to P2/6 assessment

Developing proposals to remove regional variations

WG 3 Main Interconnected Transmission System



Challenge is not only to develop a economic model which reflect range of possible future market arrangements whilst ensuring we fully model network performance under different operating criteria – made good progress, but still a number of areas which needs addressing.

WG 3 Main Interconnected Transmission System

Developing models for the planning and operation of the transmission system.

Model 1: Operational Standards

Model 2: Operational Standards, Demand Security

Model 3: Operational Standards, Demand Security plus Deterministic access

Model 4: As per Model 3 with greater discretionary access

WG 3 Main Interconnected Transmission System

Developing a T+O+X model

- **Varying N-1 or N-2 in planning and operation**
- **Consider the statistical risk of demand interruption**
- **Need to ensure any change in demand security risk is full costed and consequences agreed by all parties**

Assessing the results of Dynamic Transmission Investment Model within the TO companies

- **Comparing approaches developed during GSR 001 against DTIM results**

WG 4 Planning and Operational Contingency Criteria

Reviewing Voltage Step Change Criteria

Reviewing Sustained Voltage criteria

Reviewing the impact of changing stability assessment criteria

Reviewing fault statistics

Review the requirement for regional differences

Review the use of inter-trips in planning timescales and determine its impact on demand security.

WG 5 Offshore

Extending the criteria developed to accommodate round 1 & 2 to include projects of size and distance offshore of Round 3.

Include the connection of external interconnections to offshore transmission systems

Developed generic network designs – can include Mesh and Radial

Populated the data for the Cost Benefit Analysis (AC and DC)

Transmission Access Review

Hêdd Roberts

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Access reform: short-term building blocks 1

Connect & manage (CAP164)

- Original
  - Wider transmission access is provided within 4 years (provided local works are complete) with additional operational costs socialised
- Alternative
  - All applications received within 6 month period assessed together
  - Additional operational costs caused by early connection forecast and targeted (based on interest expressed)
  - Price then recalculated (based on offers accepted)
  - (Realistic) fixed date for completion of wider reinforcements
    - Transmission delivery risk socialised, but mitigated by strategic investment

Flexible short-term access regime to provide an alternative to long-term rights

SO release of short-term access rights (CAP161)

- SO identifies and auctions short-term capacity
  - 5 week ahead auction for 1 week capacity block
  - 2 day ahead auction for 1 day capacity block
- Administered cost option

Access reform: short-term building blocks 2

Entry capacity overrun (CAP162)

- Users can generate above access right holding but face (ex post) cost reflective charge
- Charging options
  - Simple (average) price
    - Based on a locational multiple of BSUoS-RCRC
    - Multiple known in advance
  - Targeted (average) price
    - Principle is to hold long-term rights holders whole
    - Based on (subjective) degut of balancing costs performed by the SO ex post
  - Marginal price
    - Principle is to achieve a level playing field between holders of long and short term access rights
    - Based on an optimisation of balancing costs

Entry capacity sharing (CAP163)

- Users can share access rights on a node to node basis
- Options
  1. Based on ratio of (ex post) overrun prices
     - User takes risk
     - Requires CAP162 to be approved with nodal marginal overrun price
  2. Fixed exchange rate provided by SO
     - User must specify locations, capacity and duration
     - SO assessment based on no increase in constraint costs
  3. Point to point access right provided by the SO
     - SO invests to provide point to point access right
     - Users pay nodal TNUoS differential

Access reform: long-term building blocks

Finite long-term access rights (CAP165)

- Evergreen rights cause stranding risk
  - Ageing stations with evergreen rights in exporting areas that rely on constraint income have an incentive to continue operating until the wider works are completed
- Original
  - Long-term access rights become finite (rather than evergreen)
    - Applies to new and existing users
- Alternative(s)
  - Rolling access right with [x] year notice period for reduction

Capacity auctions (CAP166)

- As CAP165, but with long-term access rights allocated by multi-round auction
- Original
  - Users bid price and duration
- Alternative
  - Users bid capacity, duration and potentially buy-back cap
  - SO calculates price

Other amendment proposals

New amendment

- Under-run and reallocation of TEC
  - Proposed by Conoco Phillips
  - Users that do not use their TEC in a year are subject to an under-run charge
    - Proposed to be 1.5×TNUoS
  - Use it or lose it provisions if TEC not used over a number of years

Potential amendment

- Based on capacity and duration auction, but with other features:
  - Buy-back cap
  - Load duration

Next steps

Majority of CUSC amendments with Ofgem for decision

- CUSC Panel vote on CAP161 to CAP165 held December 2008
- CUSC Panel vote on CAP166 held February 2009

New amendment given urgent status

- Working Group due to complete by end March 2009
- CUSC Panel vote – April/May 2009

Ofgem regulatory impact assessment

- Expect publication – April 2009

Ofgem decision on preferred model expected June/July 2009

Implementation from April 2010 onwards

Fundamental Review Program

Outline Principles – Issued November 08

High Level Proposals - March 09

Draft Change Proposals May 2009

Final Change Proposals August 2009

Fundamental Review Consultation Sept 09

Ofgem Consultation Jan 2010

Overall alignment with the Transmission Access Review – April 2010

Questions for the day

Recognising that present SQSS are perceived to be inadequate as we move forward, what are the may area we should address:-

1. **Understand basis of standards for different TO areas**
2. **View on role for Cost Benefit Analysis.**
3. **Should future standards be deterministic (based on economic principles) or should it be based solely on cost benefit**
4. **Should we reduce level of demand security to minimise operating cost**
5. **How transparent should the conversion of market signals to transmission capacity be**
6. **Nothing out of scope for today's meeting**