ofgem Making a positive difference for energy consumers

Project TransmiT

Our consultation on industry proposals (CMP213) to change the electricity transmission charging methodology

Stakeholder event
06/09/13

INTRODUCTION

KERSTI BERGE
Partner, Transmission

- Welcome

- What is Project TransmiT?
- Why is it important?
- Overview of the process
- Objectives and agenda for today

ofgem Making a positive difference for energy consumers

What is Project TransmiT?

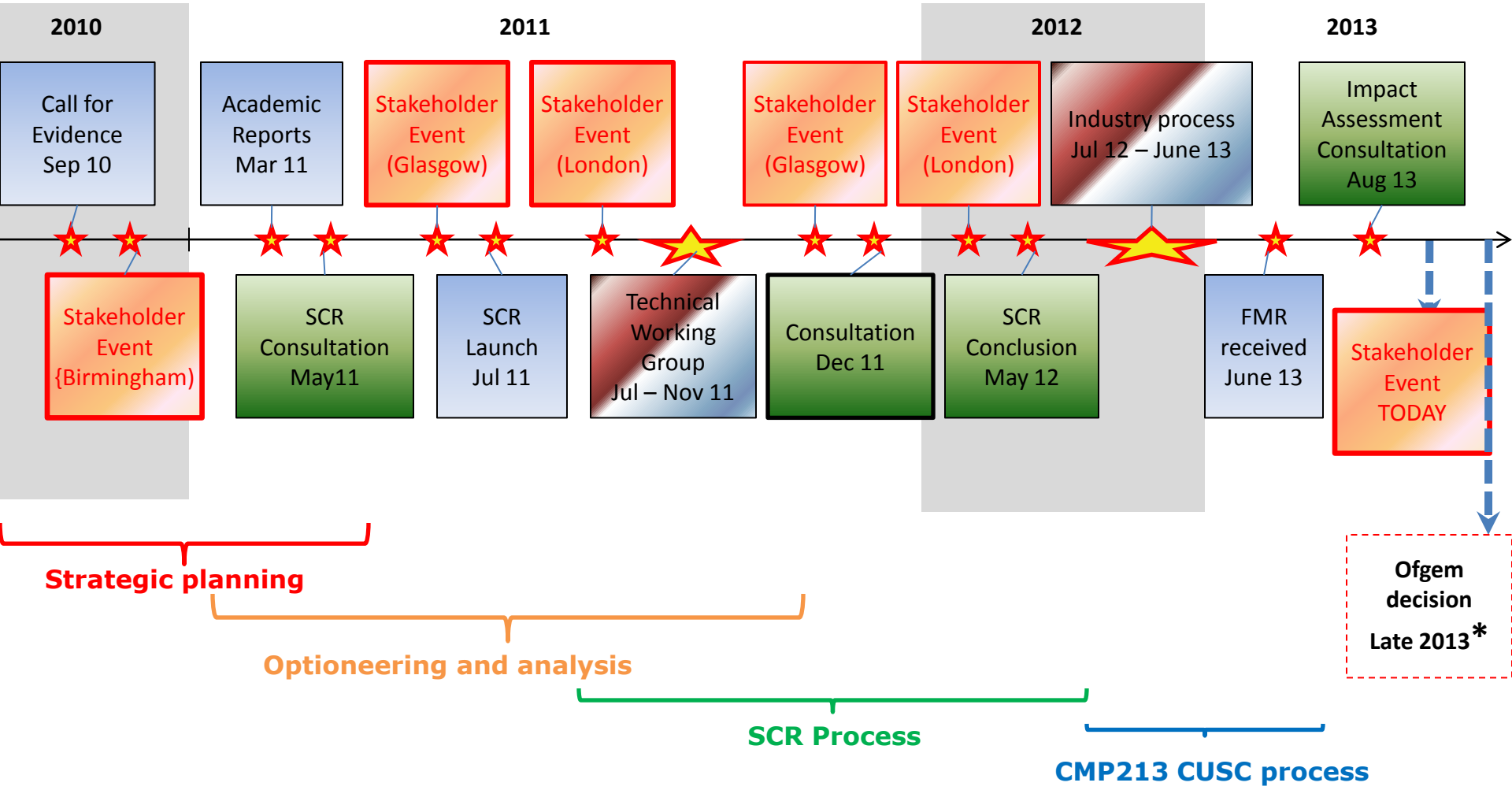
- An independent and open review of transmission charging arrangements.
- Scope limited to Transmission Network Use of System (TNUoS) charges.
- Aiming to facilitate timely transition to low carbon energy sector while continuing to provide safe, secure, high quality network services at value for money to existing and future consumers.
- A direct response to the challenge of efficiently delivering the low carbon economy at value for money to consumers.
- Identified defects in the current charging methodology. This triggered an industry led process to further develop the methodology to address these defects - CMP213.

Why is it important?

Improvements to the methodology seek to

- reflect the modern realities of Britain's generation mix
- promote effective competition
- enable more efficient decisions to be made
- secure overall benefits to consumers in the longer term from a more efficient system, and
- help meet 2020 and 2030 policy targets.

Project development & key decision points



* Depends on the evidence received and our further assessment.

ofgem Making a positive difference for energy consumers

Objectives for today

- Communicate our assessment of the charging options and our initial views of the way forward
  - including a presentation by National Grid on modelling they have done which has informed our consultation.
- For us and others to hear your views on our consultation.
- Answer your questions.
- Encourage response to the consultation.
- Summarise the next steps.

This is an important issue and your views are essential.

Agenda

10:40 – Ofgem presentation: assessment summary and initial views

11:20 – Presentation by National Grid: analytical results

11:45 – Open discussion

12:15 – Break

12:30 – Presentation by Baringa Partners ltd

13:50 – Open discussion

13:20 – Closing remarks

13:30 – End

ofgem Making a positive difference for energy consumers

ASSESSMENT AND INITIAL VIEWS

Anthony Mungall
Senior Manager, Transmission Policy

Background: SCR process

- Our SCR identified the following defects in the current transmission charging methodology
  1. It does not appropriately **reflect the costs imposed by different types of generators** (in particular renewable generators) on the electricity transmission network consistent with the investment planning methods of the TOs.
     - The existing approach only recognises peak security as a driver of transmission investment and assumes that all types of generators contribute equally to it.
  2. the **development of High Voltage Direct Current** (HVDC) links that would parallel the onshore network are not catered for in the current methodology.
     - First link due to be commissioned in 2016.
  3. the proposed **sub sea** transmission **links** from the mainland **to the Scottish Islands** are not appropriately catered for in the current methodology.
- We directed NGET to raise a modification proposal to address these defects.
- Industry process developed 27 options to address the defects identified.

ofgem Making a positive difference for energy consumers

Defects: Better reflect costs

- Locational signals are derived from modelling the incremental transmission cost of changes in demand and generation at each point on the network.
- The cost signal is reflective of the transmission capability cost impact that users of the system at different locations would have on the TOs' costs, if they were to increase or decrease their use of the system.
- An increasing amount of transmission investment is justified on the basis of avoided future constraint costs (ie a CBA) as well as investment for peak security reasons.
- **The current TNUoS methodology....**
  - assumes that all types of generators drive the same level of network investment (based on peak security) at a location and charges all plant in a zone the same tariff
  - overlooks the fact that some investment is driven more by "Year Round" considerations (ie determines the efficient balance between constraint impact and network capacity to minimise overall costs)
  - does not recognise how different types of plant contribute toward investment drivers.
    - Intermittent plant is not assumed to provide "peak security"
    - Different types of plant trigger different levels of constraint cost and drive different levels of transmission investment for year round considerations.

HVDC and islands

- Bootstraps
  - Impedance – calculation of power flow agreed by consensus
  - Cable costs – include cable cost in locational calculation
  - Converter stations – range of options for the recovery of costs (0% to 60% socialised)
- Islands
  - Impedance and cable cost treatment – as above
  - Converter stations – additional arguments for increased cost socialisation (0% to 70%)

Wider vs local

- links would be part of the “local” transmission network from a TNUoS charging perspective (and include onshore radial transmission circuitry). Security factor 1.0.
- Links would be part of the “wider” network. Security factor 1.8, but where radial circuits meet the “MITS” definition the charge is adjusted to reflect reduced security design.

Counter Correlation Factor: charge to reflect the volume of transmission constructed for the level of generation capacity using radial link to export power.

Panel vote

- The Panel voted by a majority in favour of 8 of the 27 options.

Main components of CMP213	2	19	21	23	26	28	30	33
DIVERSITY								
Sufficient diverstity assumed to exist throughout GB			x			x		
Diversity method 1	x	x		x	x		x	x
Diversity method 2								
Diversity method 3								
Sharing factor								
Historical 5 year Annual Load Factor	x		x	x		x	x	
YR Forward looking hybrid		x			x			x
Parallel HVDC: expansion factor								
Remove generic proportion of costs (60%)		x						
Remove generic proportion of costs (50%)						x	x	x
Remove specific proportion of costs (x%)			x	x	x			
Remove no cost	x							
Island links: expansion factor								
Remove generic proportion of costs (70%)								
Remove generic proportion of costs (50%)		x				x	x	x
Remove specific proportion of costs			x	x	x			
Remove no cost	x							

- Hybrid: alternative approach to the calculation of the load factor in the Original and in the options featuring Diversity 1 and 2:
  - average 5 year historical annual load factor; or
  - choice for generator between average 5 year historical or a forward looking annual forecast of load factor that would need reconciliation at the end of each year, including an incentive to provide an accurate forecast .

ofgem Making a positive difference for energy consumers

NGET's modelling approach

- NGET modelled the impacts of charging options using the modelling approach developed as part of our SCR, updated as appropriate.
- NGET did not model all 27 options but a selection of the alternatives that we consider are representative of the package of options.

	Better reflect costs	HVDC bootstrap converter stations	Islands links converter stations
NGET's Original	Sufficient diversity assumed to exist across GB (radial circuitry excluded from "wider" network)	100%	100%
WACM 2	Diversity 1	100%	100%
WACM 3	Diversity 2	100%	100%
WACM 4	Diversity 3	100%	100%
WACM 28	As per Original	50%	50%
WACM 30	Diversity 1	50%	50%
WACM 31	Diversity 2	50%	50%
WACM 32	Diversity 3	50%	50%

- All modelling was carried out using 5 year average historical load factors where applicable (the use of load factor is not relevant to the Diversity 3 approach)
- The forward looking hybrid option was considered too complex to model.

Our assessment criteria

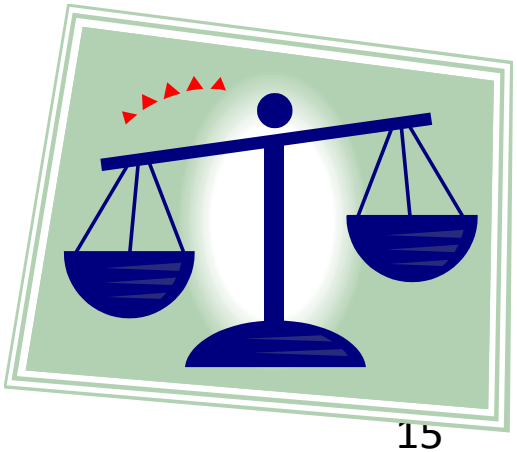
Relevant CUSC objectives

• CUSC objective a: "..facilitates effective competition…"
• CUSC objective b: "…results in charges which reflect, as far as is reasonably practicable, the costs incurred by transmission licensees."
• CUSC objective c: "..properly takes account of the developments in transmission licensees' transmission businesses."

The Authority's statutory duties

• The Authority's principal objective is to protect the interests of existing and future consumers, wherever appropriate through the promotion of effective competition. These interests include consideration of:

- The reduction of greenhouse gas emissions
- Security of supply
- Furthering competition
- Consumer bill impacts
- Impact on vulnerable and protected customers
- Impact on health and safety
- Risks and unintended consequences.
- Applicable European law



ofgem Making a positive difference for energy consumers

Interpreting the modelling results

- The model is seeking to mimic a complex energy market, but must make simplifying assumptions.
- Other factors will have significant impacts on generators' decisions - notably EMR and low carbon support levels.

Hence, the model....

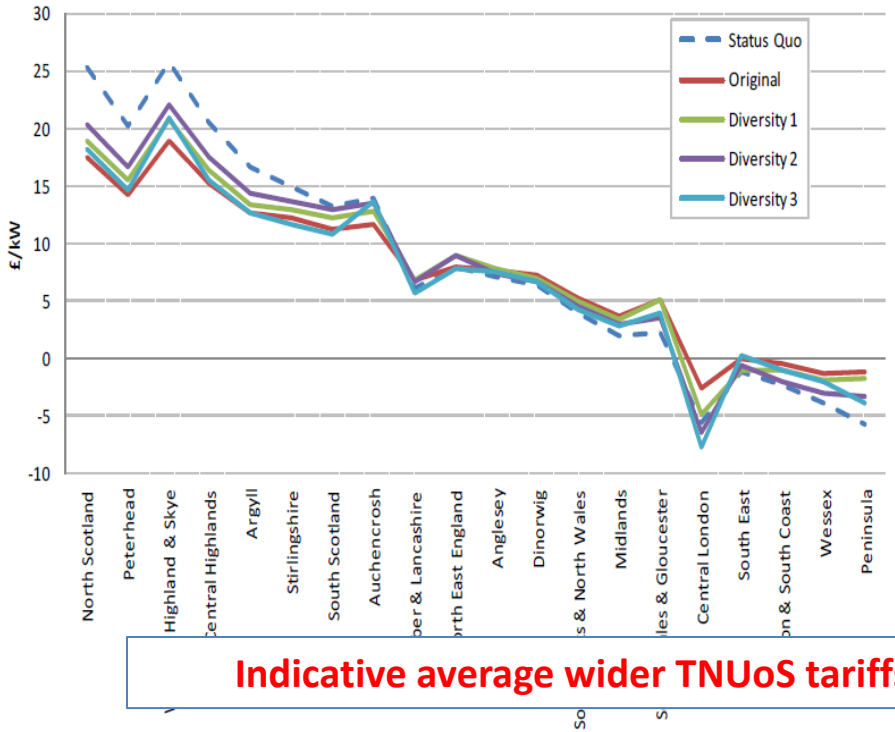
- is an approximate guide as to the likely "real world" impacts
- provides a broad sense of the magnitude of impacts and long term trends
- is influenced by simplifications in the modelling approach, ie Capacity Market.

ofgem Making a positive difference for energy consumers

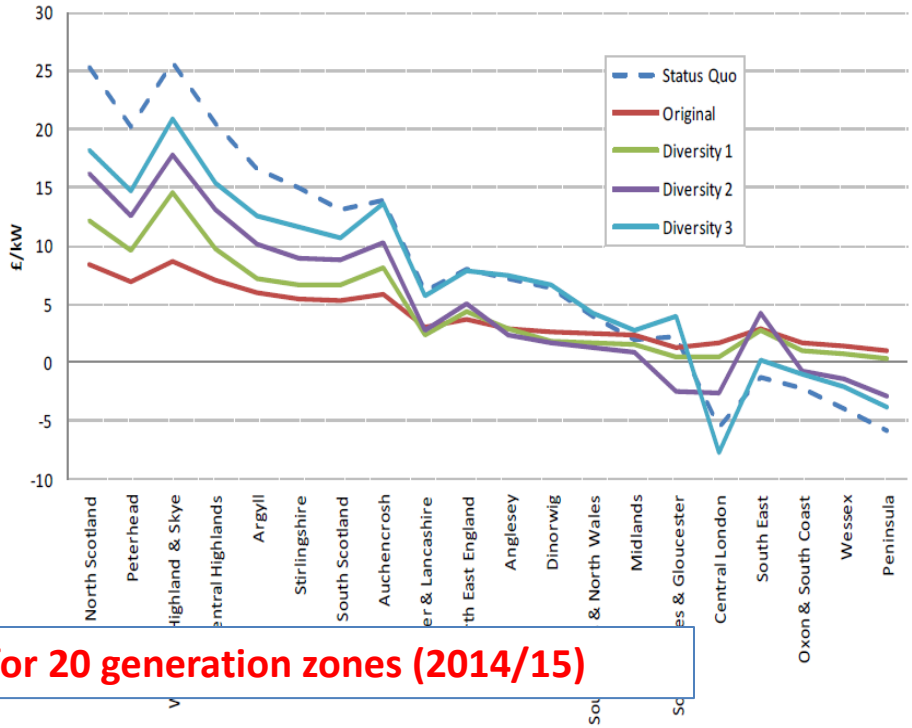
1. Impact on transmission charges

- **NGET tariff results**: all proposals reduce the "locational slope" of generation charges relative to status quo
- Status Quo provides the greatest range of locational differentials.
- NGET's Original provides the lowest range of locational differentials.
- Diversity methods 1 and 2 provide the next lowest range of differentials.

non-intermittent generators (70% load factor)



intermittent generators (30% load factor)



Indicative average wider TNUoS tariffs for 20 generation zones (2014/15)

ofgem Making a positive difference for energy consumers

2. Impact on transmission charges

- **NGET tariff results**: differences in demand TNUoS charges are minor and mainly driven by differences in generation and transmission investment.
- For options that socialise a greater proportion of HVDC converter costs…..
  - charges for generators north of the link will be lower relative to an option that does not.
  - generators in areas below the exit point onto the system from the link will pay relatively higher generator charges. This means that
    - Marginal generators are paying relatively more,
    - the capacity payments assumed by the model will be greater and
    - the wholesale costs will be larger.

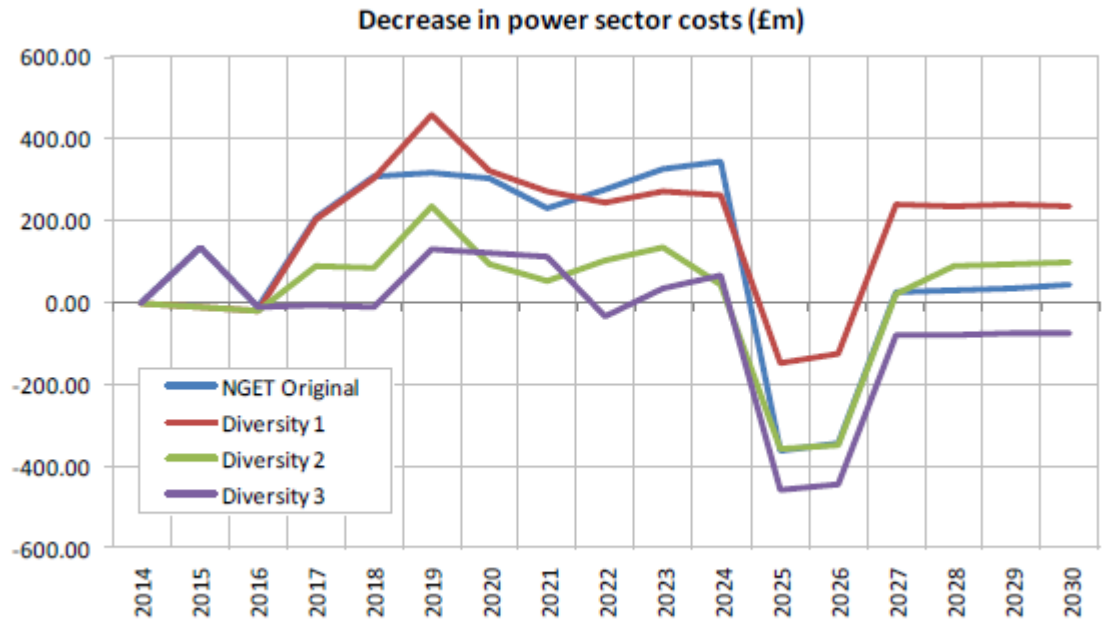
	Original – change from Status Quo			Diversity 1 – change from Status Quo		
	£/year			£/year		
	2014	2020	2030	2014	2020	2030
N Scotland	£1.88	£2.40	£3.56	£1.60	£3.27	£4.38
S Scotland	£1.24	£2.34	£3.71	£0.81	£3.25	£4.21
N England	£0.26	£0.03	£0.26	-£0.12	-£0.19	£0.23
Midlands & N Wales	£0.20	-£0.43	-£0.27	£0.04	-£0.72	-£0.62
S England & S Wales	£0.06	-£0.25	-£0.59	£0.37	-£0.20	-£1.08

Change in demand TNUoS element of bill vs Status Quo (£/customer)

Positive numbers = increase in element relative to Status Quo

Overall cost impact: power sector costs

- Annual changes in **power costs** relative to the Status Quo



Positive numbers = decrease relative to the Status Quo

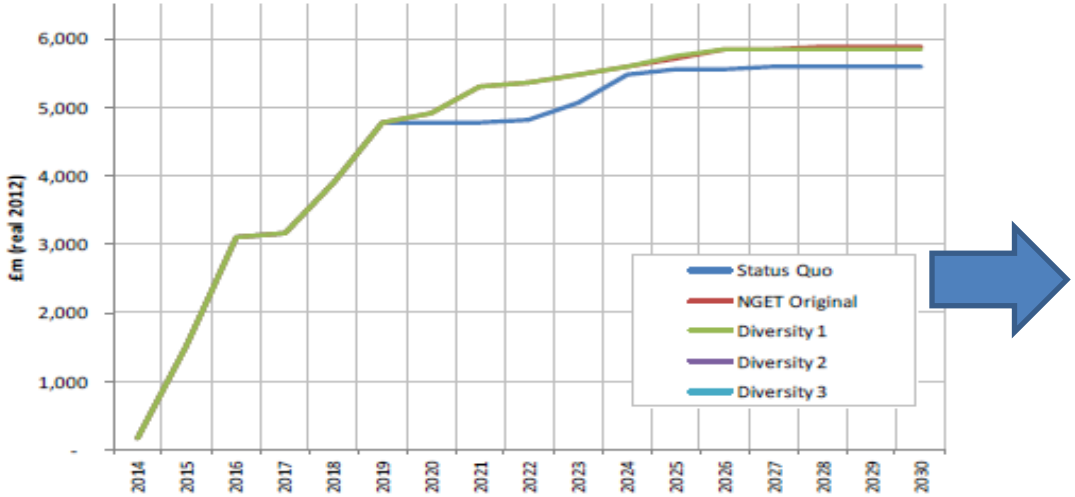
- NGET's Original and Diversity 1 (100% converter cost treatment) delivers an overall saving in power sector costs relative to the Status Quo.
- Diversity options 2 and 3 are closer to the Status Quo.

NPV

Decrease Relative to SQ	2014-2020	2021-2030	2014-2030
Div 1	924	1,025	**1,949**
Div 2	348	-41	**306**
Div 3	269	-576	**-306**

Overall cost impact: power sector cost breakdown

- **Generation costs**: considerably lower under Diversity 1 options (inc. 50% variant).
  - Offshore wind replaced by onshore wind.
- **Transmission costs**: onshore reinforcement costs were found to be very similar across all four main alternatives (Original and Diversity methods 1, 2 and 3).
- Diversity 3 options have a very similar investment profile to Status Quo.



Cumulative transmission investment.

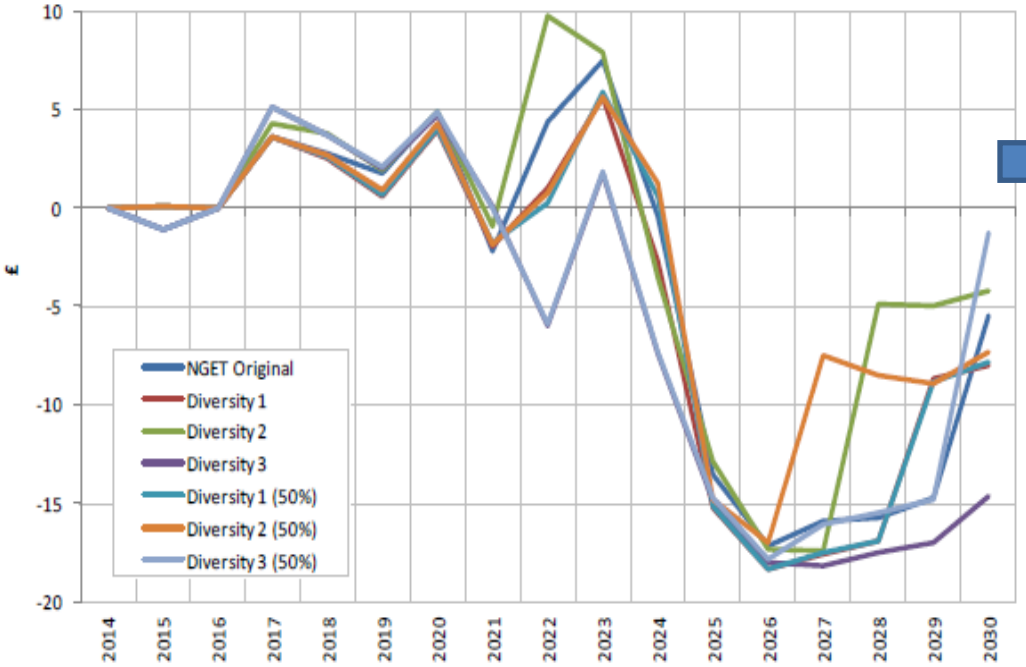
No differences in terms of the timing of HVDC bootstraps

- **Constraint costs & low carbon support costs**: similar and not a major factor driving cost impacts. Reinforcement keeps pace with development (no growth in offshore wind and slow rate of onshore wind after 2020).

Consumer bill impacts

Consumer bill impacts:

- Dominant factor is the wholesale cost of power, including the capacity payments.
- Tighter margins drive up wholesale costs.
- Wholesale costs for all modelled options are higher to the Status Quo up until 2020.
- Trend is reversed later in the modelling period.



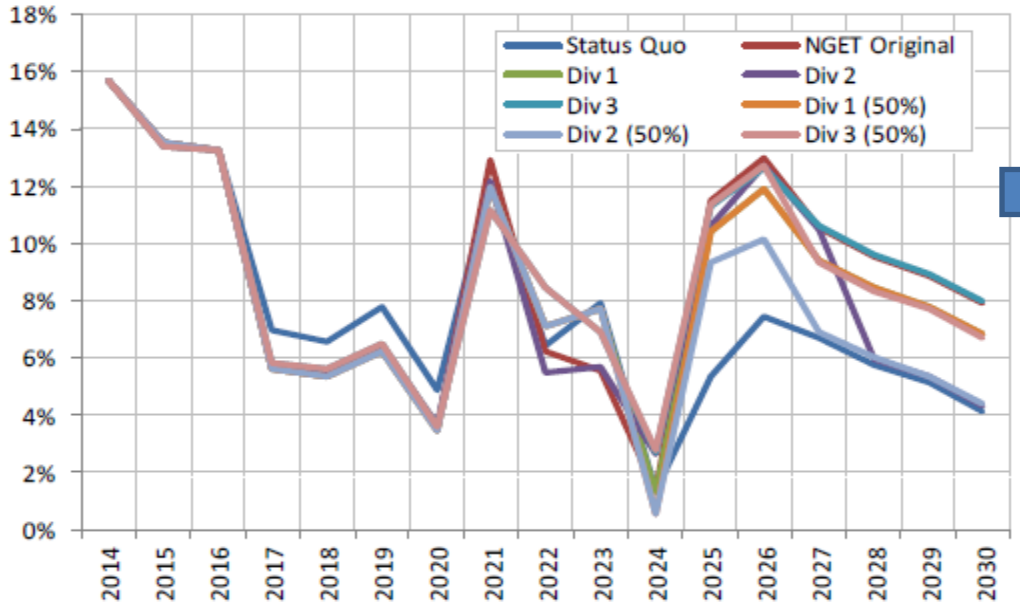
Change in average annual bill relative to Status Quo. Average 4000kWh domestic user.

NPV

Decrease Relative to SQ	2014-2020	2021-2030	2014-2030
Div 1	-719	4,511	**3,792**
Div 2	-992	2,609	**1,617**
Div 3	-944	6,102	**5,157**

Security of supply

- **NGET's analysis on capacity margins**: assumes simple capacity market to reflect policy intention of EMR, ie ensure security of supply.



De-rated capacity margins

- No impact on margins before 2017: charging changes not dominant.
- Similar trends across all options up to 2020 (reducing).
- Margins respond strongly in 2020.
  - 2021-2023: new nuclear and CCGT investment, greatest level of investment in low carbon.
  - 2024: closure of ageing plant.
  - 2025-2030: further investment in new nuclear and CCS.

ofgem Making a positive difference for energy consumers

Strategic sustainability considerations

- All options meet the 2020 and 2030 policy targets.
- Options for change with higher CfD strike prices have a higher risk of not meeting the policy targets.
- Diversity options 1 and 2 have the potential for the largest sustainability benefits relative to the current baseline.
- A cost reflective methodology can deliver targets more efficiently or achieve higher levels for the same cost.
- Wider strategic benefits of socialising a greater proportion of HVDC converter station cost are unlikely to be significant – but views invited.

We seek your views on our interpretation of these strategic considerations and further evidence on treatment of converter station costs.

Qualitative assessment

We must assess the merit of any proposed changes against

- the relevant code objectives
  - (a) Facilitate effective competition
  - (b) Reflect, as far as reasonably practicable, the costs incurred by transmission licensees
  - (c) Takes account of the developments in transmission licensees' transmission businesses.
- the Authority's principal objective and statutory duties.

- Our assessment includes the appropriate implementation date of any proposals.

We seek your views on our assessment and further evidence on impacts.

Effective competition

- **CUSC objective (a) initial views**: all options for change provide an improvement in cost reflective signal and thus effective competition relative to the baseline.

  - Redistribution of costs south to north under all modelled options.
  - A methodology that more accurately targets costs that generators impose at different locations should reduce a potential barrier to entry and improve competition.
  - Impact on marginal exit decisions expected to be small.
  - Timing of marginal exit could have short term negative impact but be outweighed by long term benefits.
  - Use of historical load factor is an appropriate balance between transparency, complexity stability and cost reflectivity.

ofgem Making a positive difference for energy consumers

Cost reflectivity: better reflects costs

- **CUSC objective (b) initial views**: all options for change are a positive step in providing charging signals that more accurately reflect the impact of the long run incremental cost of the generation mix relative to the baseline.

  - All provide a better approximation of the investment decisions determined by the assumptions used by TOs when planning investment on the system.
  - We consider WACM2 provides the closest approximation and addresses defects identified.
  - We consider it appropriate for charges to differentiate between the two drivers of investment. Diversity 3 method does not.
  - We consider the use of historical load factor is an appropriate approximation of a generators impact on investment under year round conditions. Current baseline and Diversity 3 method do not acknowledge this relationship at all.
  - The approach in Diversity method 2 is less consistent with the methods of investment decisions than Diversity 1. No clear rationale for 50% “cap”.

ofgem Making a positive difference for energy consumers

(b) Better reflect costs: HVDC and islands

- **CUSC objective (b) initial views**: all options for change are a positive step reflecting HVDC costs and island sub sea links to the users triggering the investment relative to the baseline.

  - The expansion factor calculation sets the unit cost of using each technology on the transmission network. These costs are then recovered through locational charges.
  - All options for change vary in the proportion of HVDC converter station costs that are recovered via this calculation for HVDC sub sea links.
  - Options that do not remove a proportion of HVDC converter station costs from this calculation are consistent with the current methodology for offshore generation connections.
  - Our initial view is that investment costs triggered by users should, where appropriate, be paid for by those users. This applies to island sub sea links as well.
  - We do not consider the arguments to socialise a proportion of costs to reflect the components that are analogous to AC substation costs, as presented, are sufficient.

- Of all the proposals, we consider that WACM2 best achieves this objective.

Reflecting developments

- **CUSC objective (c) initial views**: all options for change better reflect changes in the TOs' transmission businesses, including

  - the recent changes to the transmission network framework set out in the NETS SQSS
  - the transition to a low carbon economy
  - changes in generation mix
  - introduction of HVDC technology, and
  - development of island sub sea links.

- Of all the proposals, we consider that WACM2 best achieves this objective.

ofgem Making a positive difference for energy consumers

Qualitative assessment: statutory duties

Authority's statutory duties.

- Principal objective is to protect the interests of existing and future consumers, wherever appropriate through the promotion of effective competition.
- Other statutory duties are set out in the consultation (paragraph 6.67 onwards).
- Div 1 method requires less low carbon support – lowest risk to meeting targets.
- Small impact in the **short term** on capacity margins due to marginal plant closing earlier than they would otherwise (and others delaying decommissioning), but..
  - transmission costs are a very small proportion of generators' total costs
  - LCPD, EMR and commodity prices are the overwhelming drivers, and
  - Impact may be smaller than modelling suggests due to simplistic Capacity Market assumptions and complex nature of energy market.
- **Long term**, investment informed by more cost reflective charges ⟶ improved efficiency in commercial decisions ⟶ lower costs ⟶ lower consumer bills.
- Recognise short term upward pressure on bills but expect this to be outweighed by improved efficiencies in the long term.

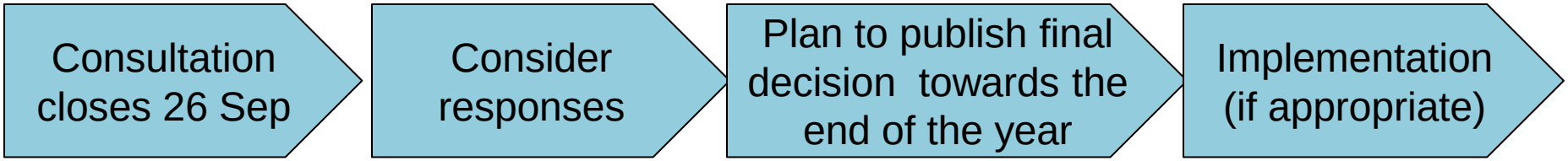
We are minded to approve WACM 2 as we consider….

- All of the options improve cost reflectivity relative to the Status Quo although those that reflect dual investment drivers and the impact of differing generators on TOs' costs are likely to support more effective competition.
- It is in the best interests of existing and future consumers (promoting more efficient long term investment decisions).
- All options meet policy targets, but a cost reflective methodology can deliver targets more efficiently or achieve higher levels for the same cost.
- It will not have a material impact on security of supply.
- It is consistent with the principles of European legislation for network access charges.
- Implementation from April 2014 would realise the benefits of an improved methodology sooner and address defects identified as soon as possible.

Responses

- Responses should be received by 26 September 2013 and should be emailed to Project.TransmiT@ofgem.gov.uk.

- Any questions? Call Anthony on 0141 331 6010.



We seek your views on our impact assessment and any further evidence that can assist our decisions.