

## Comparison of charges under different models of access reform

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TCMF Discussion

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# Introduction

**In order to move the debate on the various models of transmission access reform forward, National Grid has completed analysis to compare the impact of the various models on:**

- ◆ Existing and new generator prices
- ◆ Prices for various generation types (including wind)
- ◆ Costs for consumers

**National Grid welcomes all views in response to this analysis, and any suggestions industry representatives may have on further analysis**

# Agenda

## Access models

- ◆ Connect & manage with....
  - Socialised costs (CAP164 original)
  - Targeted costs
    - Target at those connecting early (CAP164 Alternative with CAP165 Alternative)
    - Target locationally (Interim Connect & manage with locational BSUoS)
  - Long-term fixed prices (rejected by the CUSC Panel)

## Pricing scenarios

- ◆ Additional 450MW renewable generation next year
- ◆ Additional 4.62TWh pa renewable generation [based on Brattle analysis]

## Results

## Discussion

- ◆ Views?
- ◆ What further analysis is required?

# Access models 1

## Model 1: Connect & manage with socialised costs (CAP164 Original)

- ◆ All new Users get access to the transmission system within 4 years provided local works have been completed
- ◆ All Users pay TNUoS charge

## Model 2: Connect & manage with targeted costs 1 (CAP164 Alternative)

- ◆ All new Users submit requests for network access and NG provide associated offers
  - Access is granted when local works are complete
  - Between completion of local and wider works, Users pay price based on NG forecast of additional constraint costs caused
  - From forecast wider works completion date, Users pay TNUoS
- ◆ Users either accept or reject offer
  - Price for those that accept is recalculated (if some Users have not accepted)
- ◆ Additional notice period for TEC reduction (CAP165 alternative) assumed

# Access models 2

## Model 3: Connect & manage with targeted costs 2 (Interim C&M with locational BSUoS)

- ◆ All new Users get access to the transmission system when local works have been completed
- ◆ All Users pay TNUoS charge
- ◆ All Users on the exporting side of derogated main transmission boundaries pay locational BSUoS charge

## Model 4: Connect & manage with long-term fixed prices

- ◆ All Users (new and existing) submit requests for network access in first round of annual process and NG calculate associated price
  - Requests must not exceed local capacity nomination
  - Requests can include load duration and buy-back collar
  - Price based on forecast short-run marginal cost
    - Efficient network:  $SRMC = LRMC$
    - Overallocated network:  $SRMC > LRMC$
- ◆ Users can update submission in future rounds of process

# Pricing scenarios

## For models 1 to 3, the following scenarios have been considered:

- ◆ Scenario 1: Assume an additional £40m pa of constraint costs caused by the connection of an additional 450MW (1.2TWh) of wind generation in Northern Scotland
  - Based on constraint forecast work associated with consideration of interim connect & manage
- ◆ Scenario 2: Assume an additional £240m pa of constraint costs caused by the connection of an additional 4.62TWh of wind generation in Scotland
  - Based on Brattle analysis for CAP148 Impact Assessment
    - 4 year base case between 2013 and 2018

## For model 4:

- ◆ Probabilistic generation output based on load curves used to calculate time-average zonal short-run marginal costs
  - This has been calibrated against the Scottish constraint forecast for 2009/10

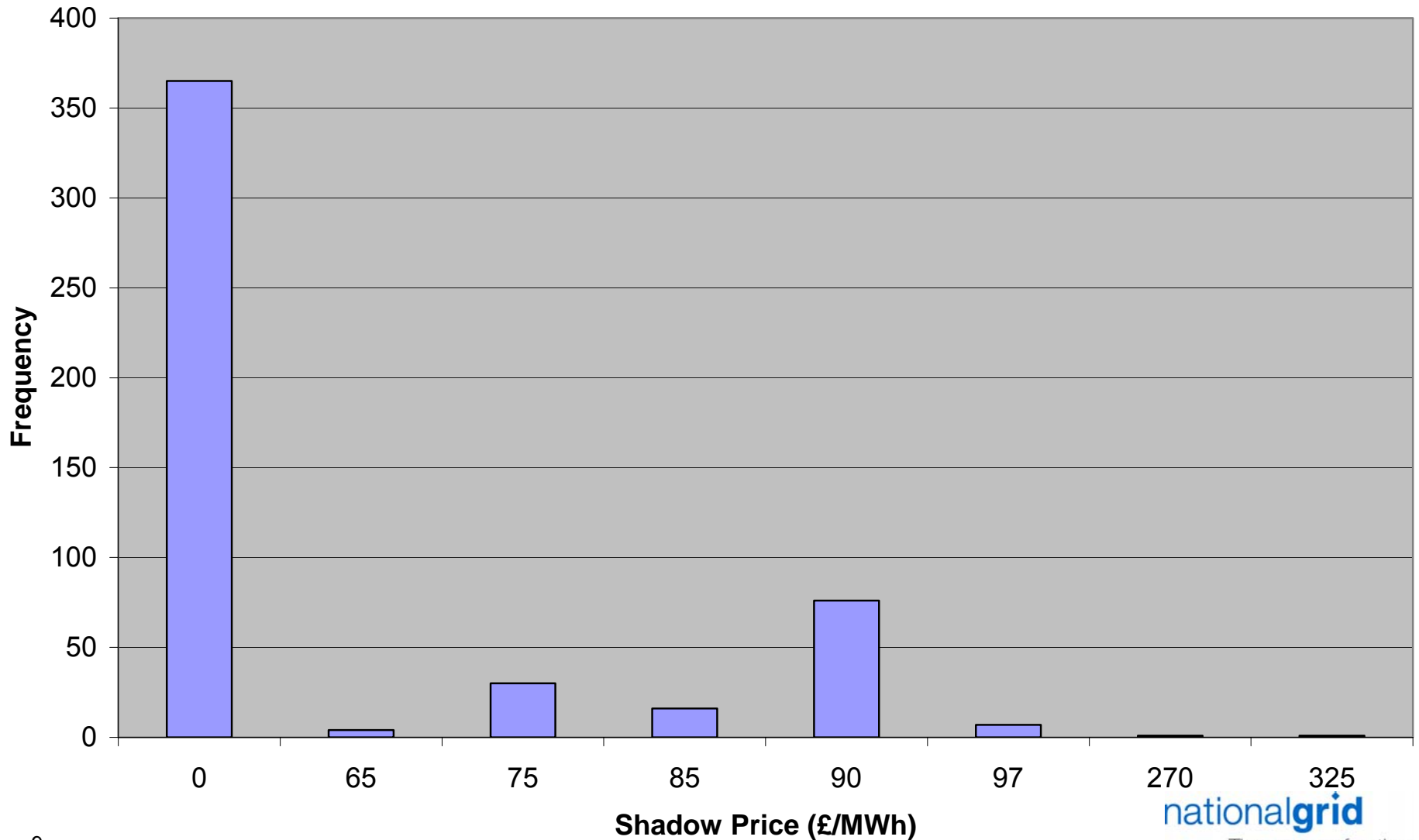
# Results – Models 1,2 & 3; Scenario 2

	£/MWh for E&W Thermal Generation	£/MW/h for Scottish Thermal	£/MW/h for Renewables in E&W	£/MW/h for Renewables in Scotland	Cost to Consumer per annum
<b>Today</b>	S. Nuclear = 1.82 Humber Gas = 2.52 South Coal = 1.10	Nuclear = 3.61 Gas = 5.49 Coal = 6.03	Estuary = 1.66	North Scotland = 9.51 South Scotland = 6.57	Total cost = £1542m
<b>Model 1 – socialise</b>	S. Nuclear = 2.19 Humber Gas = 2.90 South Coal = 1.48	Nuclear = 3.98 Gas = 5.87 Coal = 6.40	Estuary = 2.03	North Scotland Exist = 9.89 New = 9.89 South Scotland = 6.95	+£120m
<b>Model 2 – target at new</b>	S. Nuclear = 1.82 Humber Gas = 2.52 South Coal = 1.10	Nuclear = 3.61 Gas = 5.49 Coal = 6.03	Estuary = 1.66	North Scotland Exist = 9.51 New = 54.91 South Scotland = 6.57	+£0m
<b>Model 3 – loc BSUoS</b>	S. Nuclear = 1.62 Humber Gas = 2.33 South Coal = 0.96	Nuclear = 13.76 Gas = 15.37 Coal = 15.7	Estuary = 1.54	North Scotland Exist = 18.79 New = 18.79 South Scotland = 16.32	-£78m

# Model 4 - Scenario

<b>Generation type</b>	<b>Bid Price (£/MWh)</b>	<b>Offer price (£/MWh)</b>
<b>Wind</b>	<b>-50</b>	<b>10,000</b>
<b>Nuclear</b>	<b>-100</b>	<b>10,000</b>
<b>Base Gas</b>	<b>10</b>	<b>40</b>
<b>Base Coal</b>	<b>15</b>	<b>60</b>
<b>France</b>	<b>20</b>	<b>80</b>
<b>Other renewables</b>	<b>23</b>	<b>90</b>
<b>Water</b>	<b>23</b>	<b>90</b>
<b>Marginal Gas</b>	<b>25</b>	<b>100</b>
<b>Marginal Coal</b>	<b>30</b>	<b>120</b>
<b>Pumped Storage</b>	<b>75</b>	<b>300</b>
<b>Peakers</b>	<b>100</b>	<b>400</b>

# Results – Model 4: Distribution of shadow prices



# Results – Model 4

	£/MWh for E&W Thermal Generation	£/MW/h for Scottish Thermal	£/MW/h for Renewables in E&W	£/MW/h for Renewables in Scotland
Model 4 – fixed long-term price	S. Nuclear = -3.68 Humber Gas = 0 S. Coal = -3.91	Nuclear = 25.90 Gas = 30.06 Coal = 33.63	Estuary = -5.01	North Scotland = 30.44 South Scotland = 26.57

Model in development - Illustrative only

## Notes:

- ◆ Further work required to confirm magnitude of prices
- ◆ Model 4 is most significant change away from the status quo and has not benefited from wider industry development
  - Many pessimistic assumptions have had to be made in calculating charges
  - Charges based on marginal (rather than average) prices
- ◆ Relative prices between generation types very different to other models

# Views?

## For all models, what is the appropriate basis for the calculation of ex ante prices based on constraints?

- ◆ Appropriate bid/offer prices?
  - Margin effects, etc.
- ◆ Appropriate load duration?
  - Historic / forecast / other?
- ◆ How can load duration or buy-back collar be assumed in pricing if not contractually firm?
- ◆ Appropriate merit order?
- ◆ Marginal or average?