

## MOD0517 – Analysis on Review of the Merit Order within the Transportation Model



MOD0517 Workgroup  
15 December 2014

## NTS Transportation Model - Overview



# The Transportation Model

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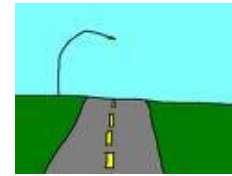
The NTS Transportation Model comprises:



The Transport Model, which;  
calculates the Long Run Marginal Costs (LRMCs) of transporting gas from each entry point to a “reference node” and from the “reference node” to each relevant offtake point.



- The Tariff Model, which;
- i) adjusts the LRMCs to maintain an equal split of cost between Entry and Exit points to obtain Entry Auction Reserve Prices
  - ii) calculates a required Revenue Adjustment Factor to recover the Target Exit Revenue

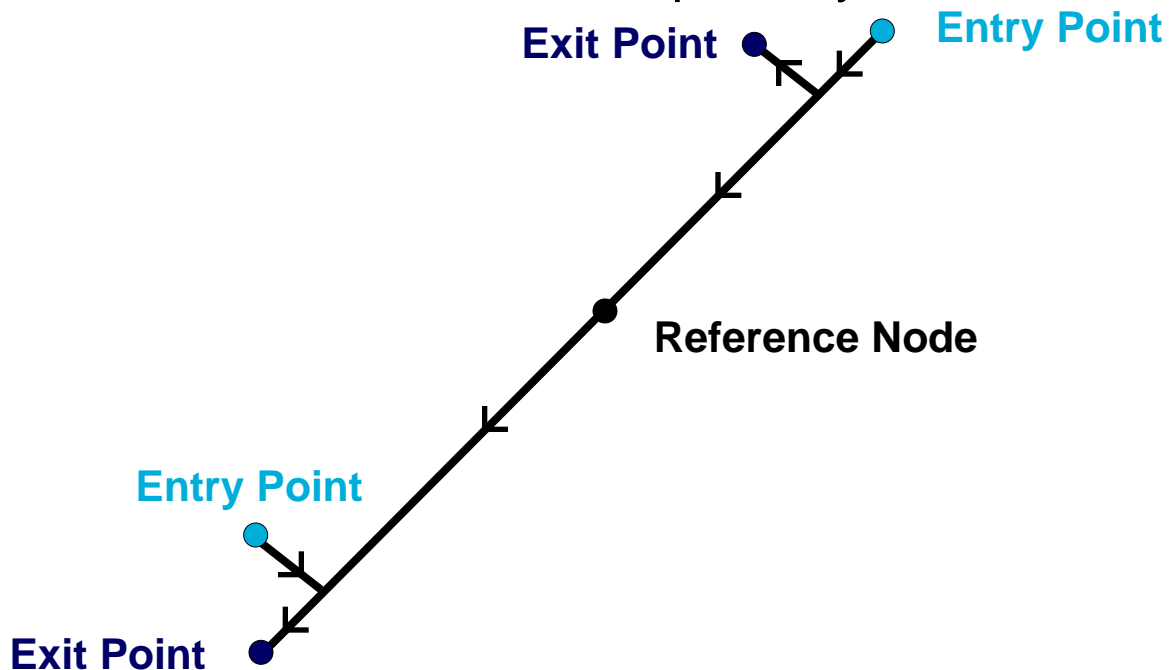


# The Transport Model

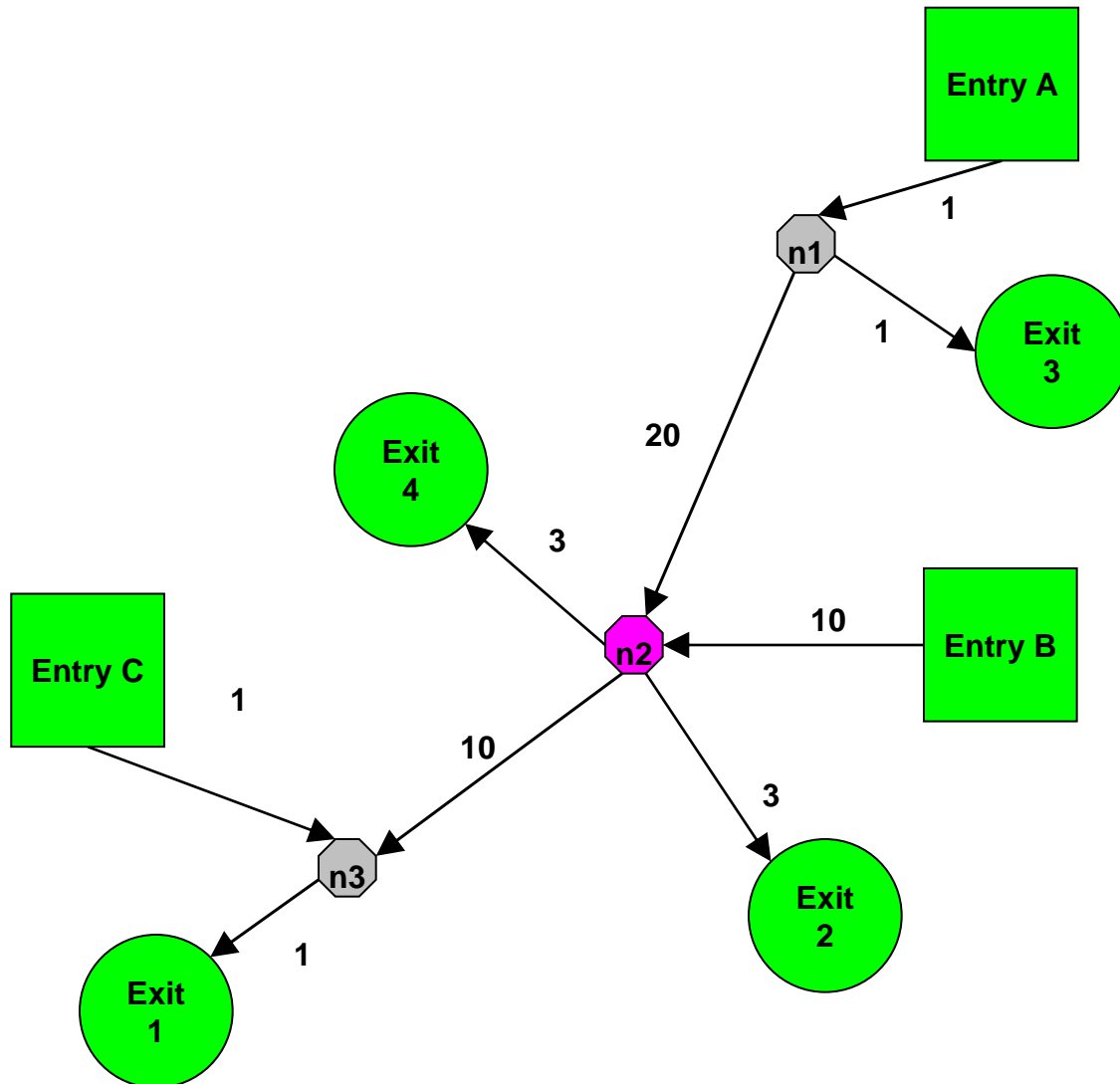
The Transport Model calculates the LRMCs of transporting gas;

- from each entry point to a “reference node” and
- from the “reference node” to each relevant offtake point.

The reference node does not affect the final charges and is included in the Model for transparency.



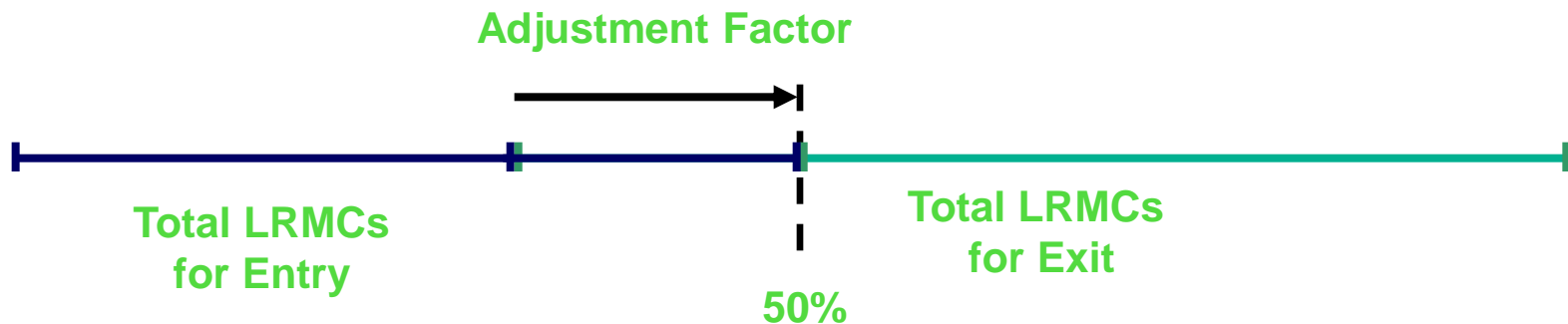
# Example Network



	Entry A	Entry B	Entry C
Exit 1	21	10	-9
Exit 2	11	3	-19
Exit 3	3	-19	3
Exit 4	3	-19	3

# The Entry Tariff Model

- Adjusts the LRMCs to maintain an equal split of cost between Entry and Exit users to obtain Entry Capacity auction reserve prices
  - An additive constant Adjustment Factor is calculated, which when added to each LRMC, gives a revised marginal distance for each supply and for each demand. The calculation simultaneously removes the negative marginal distances by collaring the LRMCs at zero.



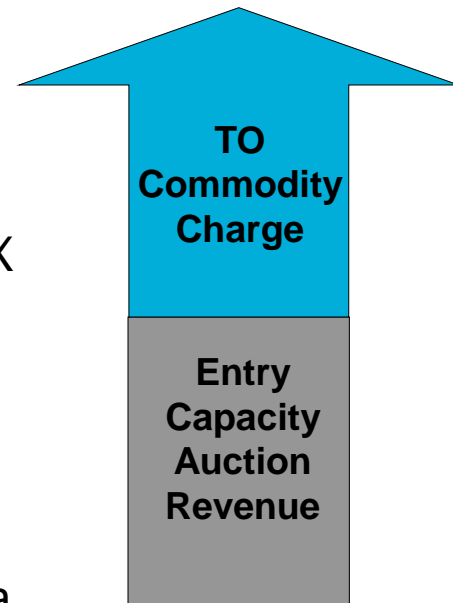
- Converts cost into prices via the annuitisation factor

# The Entry Tariff Model

## Entry Capacity Reserve Prices



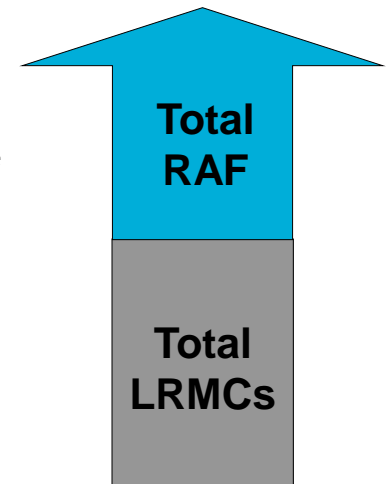
- The auction reserve prices are obtained by the Tariff Model from LRMCs (no adjustment for allowed revenue) leading to both TO & SO revenue.
  - Where National Grid forecasts that the TO entry capacity auction revenue will be below the target revenue a TO Commodity charge is applied.
- The Price for each ASEP and each price step is calculated with the relevant ASEP flowing at the relevant (obligated or incremental) flow level
  - $\text{Marginal Cost} = \text{marginal distance} \times \text{Expansion Factor} \times \text{CV correction factor}$ 
    - The expansion factor is calculated at a planning CV
  - $\text{Reserve Price} = \text{Marginal Cost} \times \text{Anuitisation Factor}$
- Reserve price are calculated such that they are collared at a minimum value of 0.0001 p/kWh/day.



# The Exit Tariff Model

## Administered Exit Charges

- Calculates the required Revenue Adjustment Factor to recover the Target Exit Revenue
  - A single additive constant Revenue Adjustment Factor (RAF) is calculated, which when added to the LRMC at each demand, gives a revised marginal distance for each demand, such that the total revenue to be recovered from exit charges equals the target revenue.
- The calculation simultaneously removes the negative marginal distances by collaring the revenue to that level implied by the minimum price of 0.0001 p/kWh.



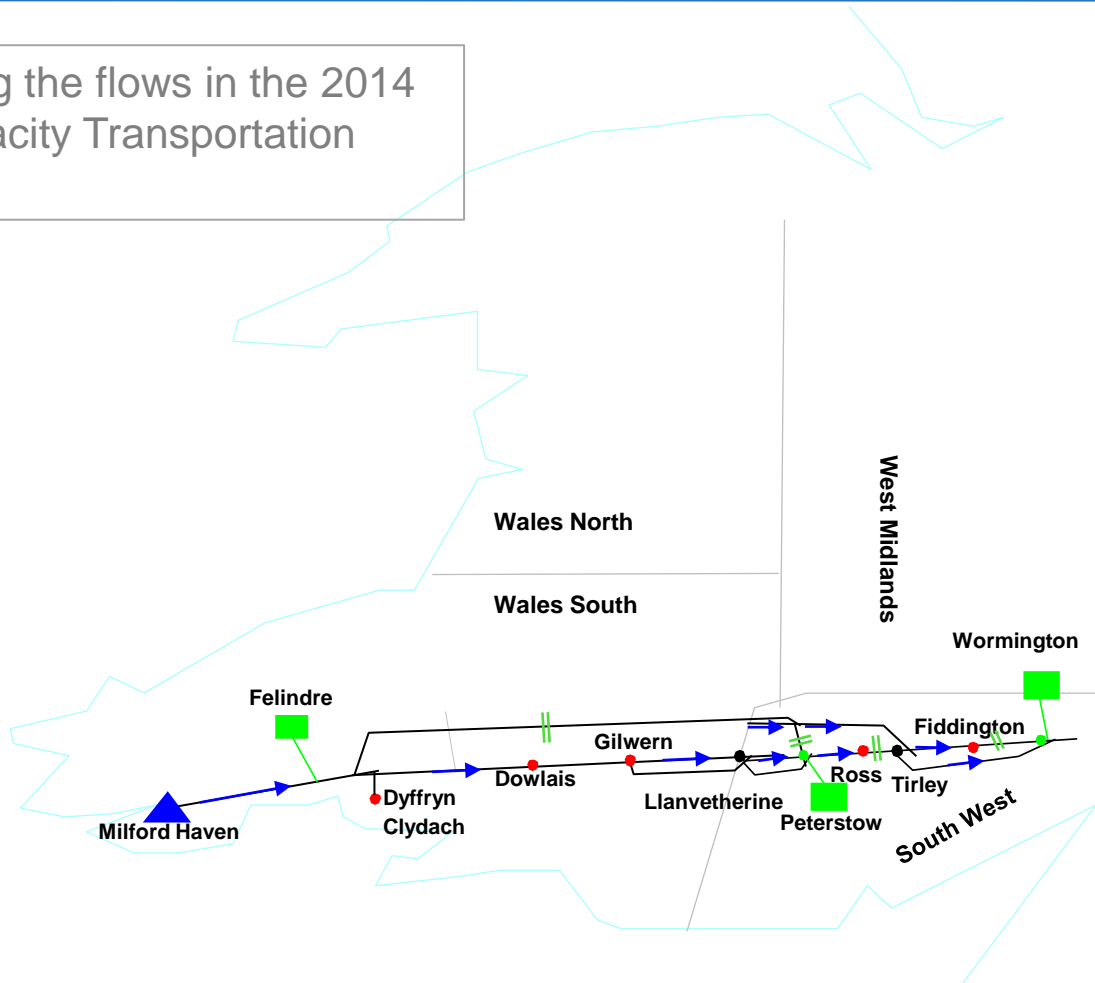


## South West Area Example



# South West Area – Pipeline Diagram

Reflecting the flows in the 2014 Exit Capacity Transportation Model



## Exit Prices in South Wales

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- Using 2014 Exit Capacity Model
- Modelling option 3 and the LRMC impacts
- Focus on Exit, to show the change in the adjusted LRMC values (i.e. after the Revenue Adjustment Factor)
- Show the change in Exit Capacity charges as a result of the LRMC change

## Exit Prices in South West Area

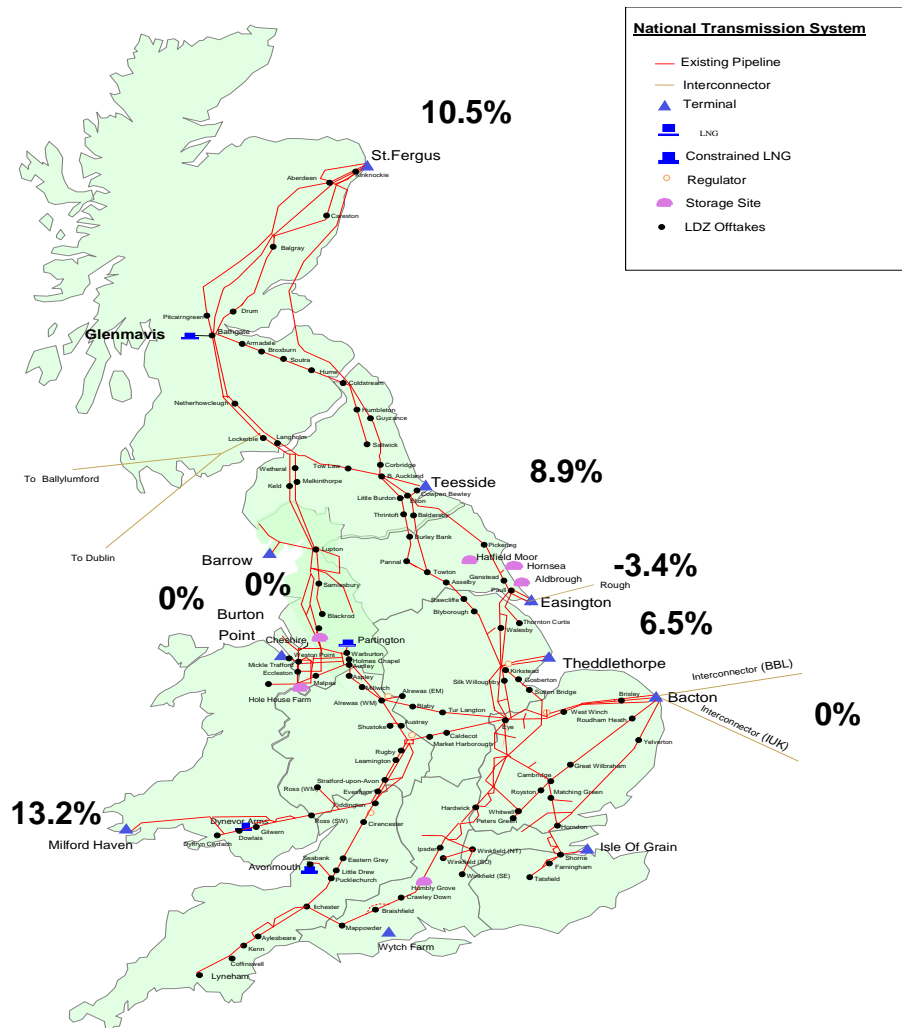
	Milford Haven	Dyffryn Clydach	Dowlais	Gilwern	Ross
Original Entry LRMC*	243.92	117.34	83.27	66.50	23.49
Option 3 Entry LRMC*	129.16	2.58	-31.49	-48.26	-91.27
Difference	114.76	114.76	114.76	114.76	114.76
Original Exit LRMC#	N/A	2.74	36.81	53.58	96.59
Option 3 Exit LRMC#	N/A	111.95	146.02	162.79	205.8
Difference	N/A	109.21	109.21	109.21	109.21
Original Exit Price	N/A	0.0002	0.0028	0.0040	0.0073
Option 3 Exit price	N/A	0.0084	0.0110	0.0122	0.0155
Difference	N/A	0.0082	0.0082	0.0082	0.0082

\*Entry LRMC = Unadjusted (Raw) Entry LRMC  
 #Exit LRMC = Exit LRMC including Revenue adjustment

## Grouping Impacts



# Average percentage change in revenue – QSEC 2014 Auction



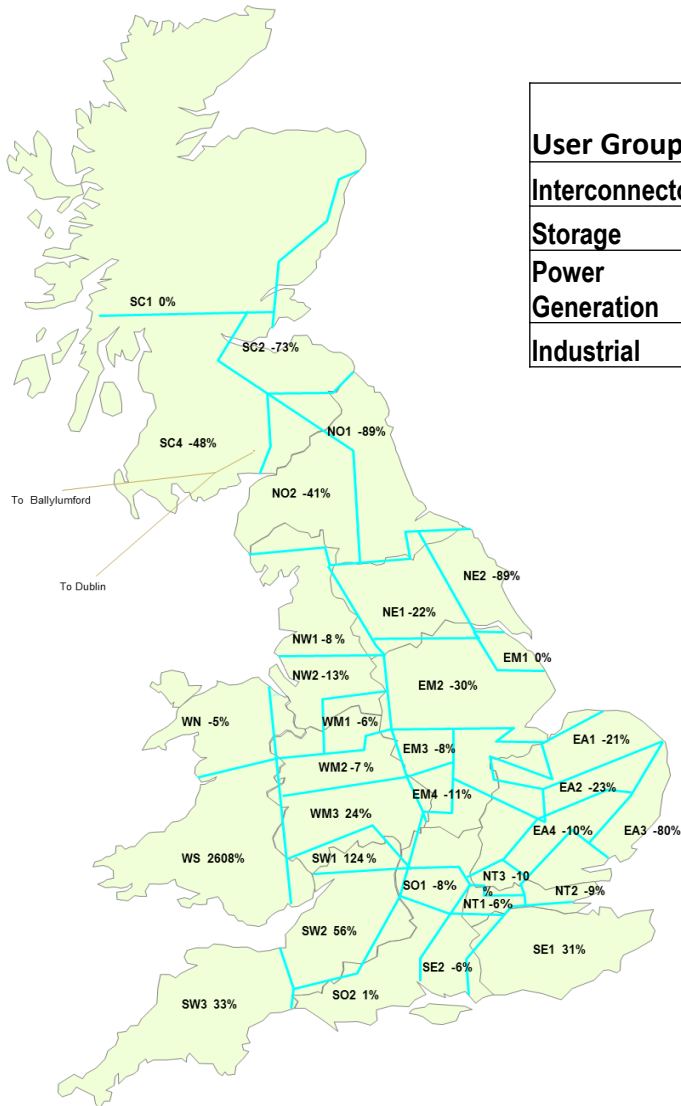
Option 3 average percentage change in revenue from QSEC 2014 Auction.

Booked capacity in the QSEC 2014 Auction.

Average percentage change at each entry point based on what capacity was booked against original and Option 3 updated Entry capacity prices.

Assumed that bookings remain the same.

# Average percentage change in revenue – 01/10/2013 – 30/09/2014



User Group	Percentage Change
Interconnector	-92%
Storage	-4%
Power Generation	12%
Industrial	-13%

Option 3 average percentage change in collected revenue from Exit Capacity between 01/10/2013 and 30/09/2014.

Average percentage change at each exit point based on what capacity was booked against original and Option 3 updated Exit capacity prices.

Assume that bookings remain the same.