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Overview of NTS Charging Arrangements

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Introduction

- This presentation provides an overview of the NTS charging methodology and how National Grid collects allowed revenue through Transportation Charges
- National Grid's NTS Licence obliges us to have a network code (UNC) which defines charges and a Charging Methodology which defines the charge rates (Prices)
- NTS Charging Methodology (UNC Section Y) seeks to set charges such that Actual Revenue = Maximum Allowed Revenue in a way that is
  - Cost Reflective,
  - Non Discriminatory,
  - and Promotes Competition

All references to "National Grid" in this presentation refer to National Grid Gas plc in its role as holder of the Gas Transporter Licence in respect of the NTS (the "Licence").

Overview of NTS Charging Arrangements

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1. **Introduction**
   - The System
   - The Commercial Model
2. **Allowed Revenue**
3. **The Transportation Charging Methodology**
   - Exit Capacity Charging
   - Entry Capacity Charging
   - The Transportation Model
   - SO Charges
4. **Under/Over Recovery ("K")**
5. **Incremental Capacity & Revenue Drivers**

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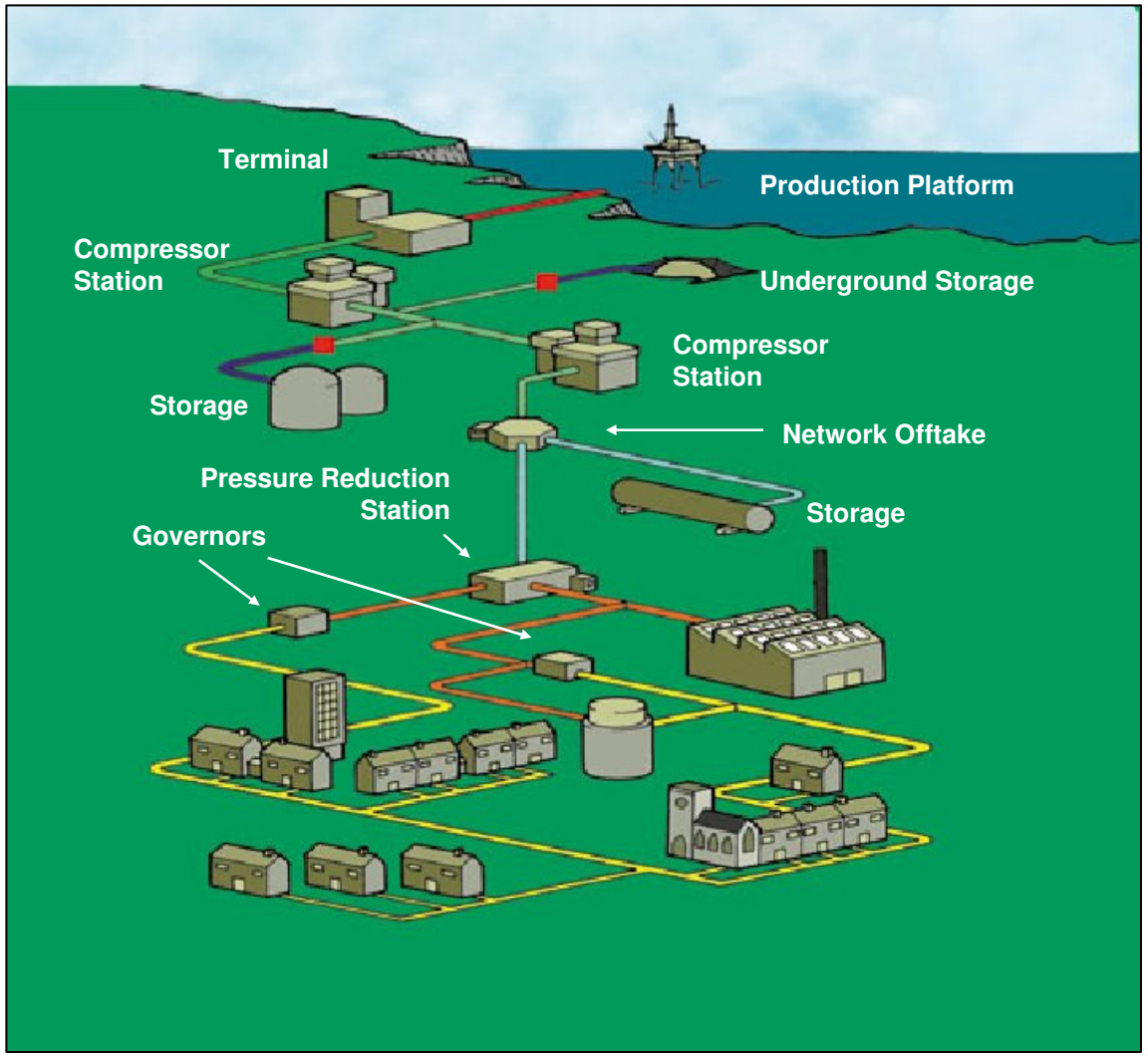
Beach to Meter



Offshore Pressure
100 – 150 Bar

National Transmission System (NTS)
85 – 25 Bar

Local Transmission System
70 – 7 Bar

Distribution
Intermediate Pressure
7 – 2 Bar

Medium Pressure
2 Bar – 75 mbar

Low Pressure
75 mbar –21 mbar

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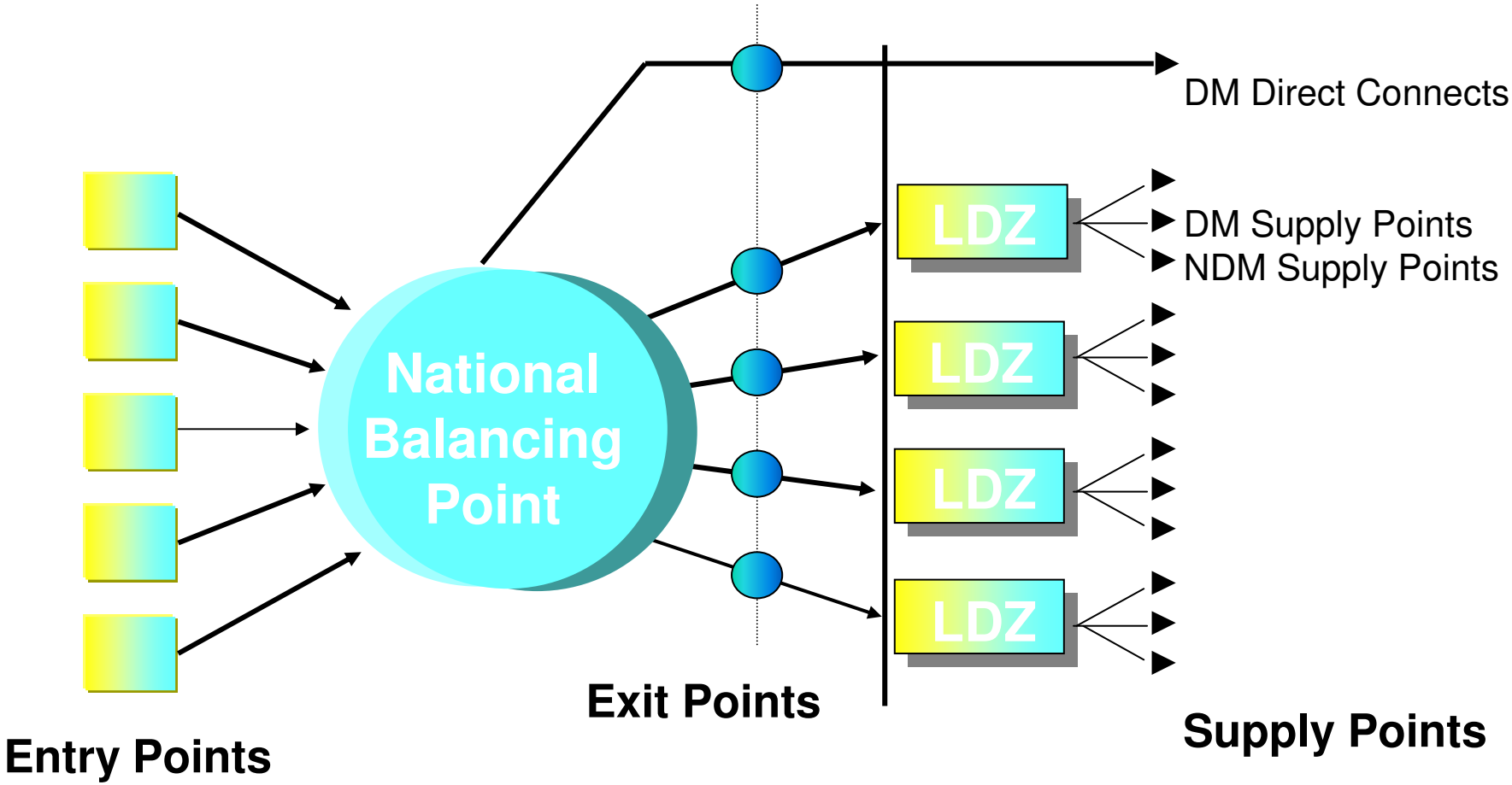
Overview of the commercial model



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Contractual Framework

- **Licences**
  - Gas Transporter Licence
  - Shipper Licence
  - Supplier Licence
- **Uniform Network Code**
  - Governs relationship between Gas Transporters and Shippers
  - Defines charges
    - Transportation,
    - Balancing,
    - Neutrality
  - UNC now includes Transportation & NTS Connection Charging Methodologies which define charge rate (prices) calculation methodologies
- **Charging Statements**
  - Statement of Transmission Transportation Charges
    - Entry/Exit Capacity & Commodity Prices

EC Regulations

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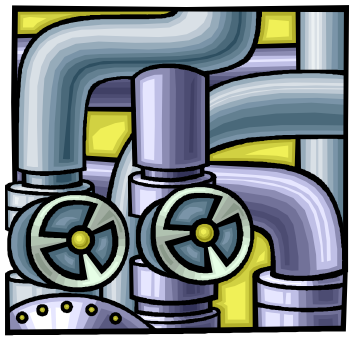
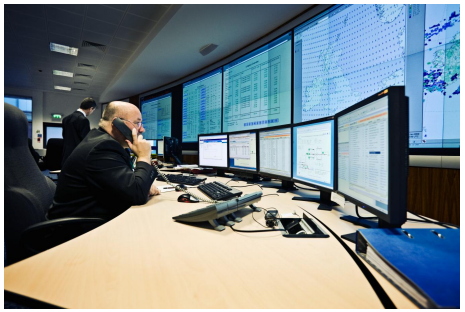
Allowed Revenue

NTS Allowed Revenue





- Transmission Owner (TO)
  - Allowed earnings from depreciation, return and opex relating to regulatory asset value (RAV) of the NTS
  - Includes some pass through costs
    - Licence fees
    - Rates
- System Operator (SO)
  - Allowed earnings from SO costs & incentive schemes
  - Includes
    - Shrinkage & Operating Margins
    - Internal Costs
    - Incremental & Non-obligated Entry/Exit Capacity
    - Incentive Performance
    - Neutrality (cost pass through)

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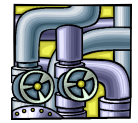
TO Maximum Allowed Revenue



$$TOMR_t = TOZ_t - TOZA_t + TOF_t + TOG_t - TOK_t$$

- + Base revenue
- - Milford Haven adjustment
- + Pass-through costs
- + TO incentive adjustment
- - Over/under-recovery adjustment

Special Condition C8B 3(a)

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SO Maximum Allowed Revenue

$$SOMR_t = SOEIRC_t + SOExIRC_t + SOOIRC_t + SOIntIRC_t + SORA_t + BBIOCA_t + DELINC_t - SOK_t$$

$SOEIRC_t$	+ Entry incentive revenue and costs
$SOExIRC_t$	+ Exit incentive revenue and costs
$SOOIRC_t$	+ External cost incentive revenue and costs
$SOIntIRC_t$	+ Internal cost incentive revenue and costs
$SORA_t$	+ Income adjusting event allowance
$BBIOCA_t$	+ Buyback incentive overall collar adjustment
$DELINC_t$	+ Entry and exit project permit allowance
SOK_t	- Over/under-recovery adjustment

Special Condition C8C 3(a)

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NTS Transportation Charging Methodology

How does National Grid collect allowed revenue?

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- Licence allowed revenue defines what we can recover through charges to NTS users for each formula year
- UNC permits us to charge shippers and DNOs in accordance with NTS Charging Methodology (UNC TPD Section Y)
  - Billing process administered by Xoserve
  - Some allowed costs and revenues passed through UNC defined energy and capacity neutrality arrangements
- Licence/UNC obligations
  - NTS Capacity Charges changes once per year from 1st October
  - NTS Commodity Charge changes twice per year from 1st April and 1st October
  - Two months notice of transportation charge changes

Allowed Revenue & Transportation Charges

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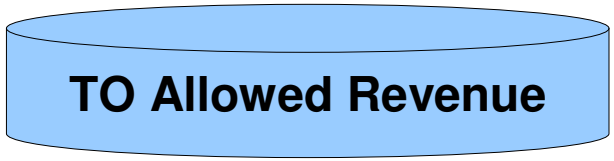
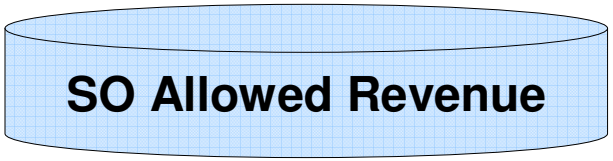
- TO allowed revenue recovered mainly from capacity charges
- SO allowed revenue recovered mainly from commodity charges
- Effective 50:50 split between Entry and Exit charges



TO Charges

DN Pensions Deficit & NTS Metering	
Entry Capacity	Firm Exit Capacity
Entry Commodity (when a revenue shortfall from capacity auctions is forecast)	Exit Commodity (unsold baseline)



SO Charges

St Fergus Compression + Short-haul + Incremental Entry/Exit + Neutrality	
Entry Commodity	Exit Commodity

NTS Entry/Exit Charge Application

Non-Storage Entry

TO Entry Capacity (Auctions)*

TO Entry Commodity

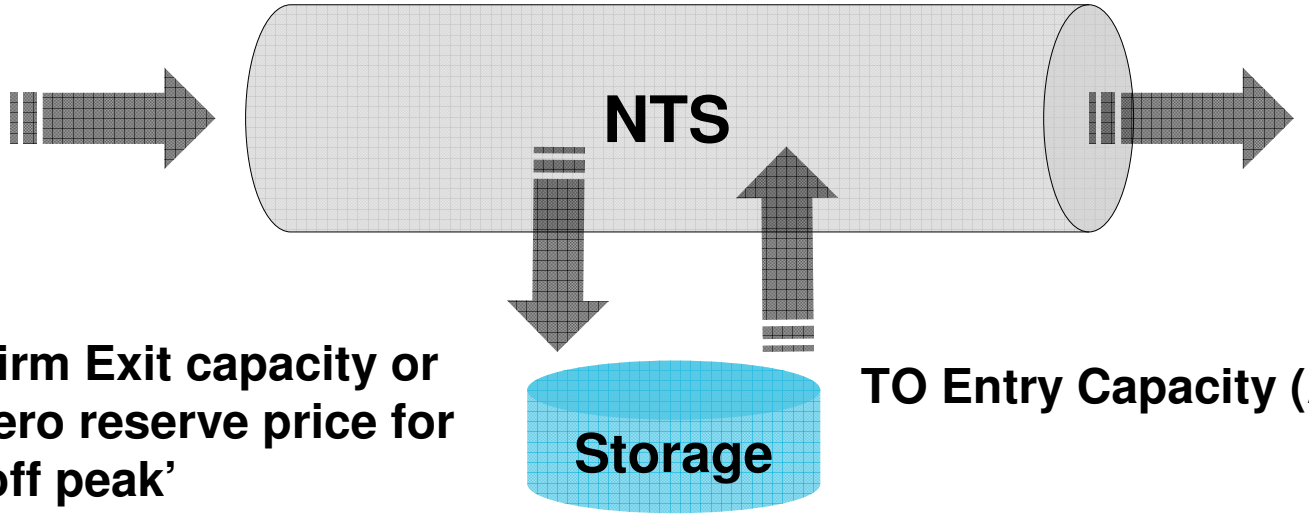
SO Commodity

Non-Storage Exit

TO Exit Capacity (Firm)* or zero reserve price for 'off peak'

TO Exit Commodity

SO Commodity



Firm Exit capacity or zero reserve price for 'off peak'

TO Entry Capacity (Auctions)*

Entry and Exit Commodity charges are NOT applied at storage sites except for 'own use gas'. Commoditised costs are only recovered from 'new' gas entering the system and from gas that permanently leaves the system to avoid double counting.

**** Currently SO revenue from Incremental capacity i.e. above the obligated capacity level. In RIIO-T1 period this is proposed to be TO.***

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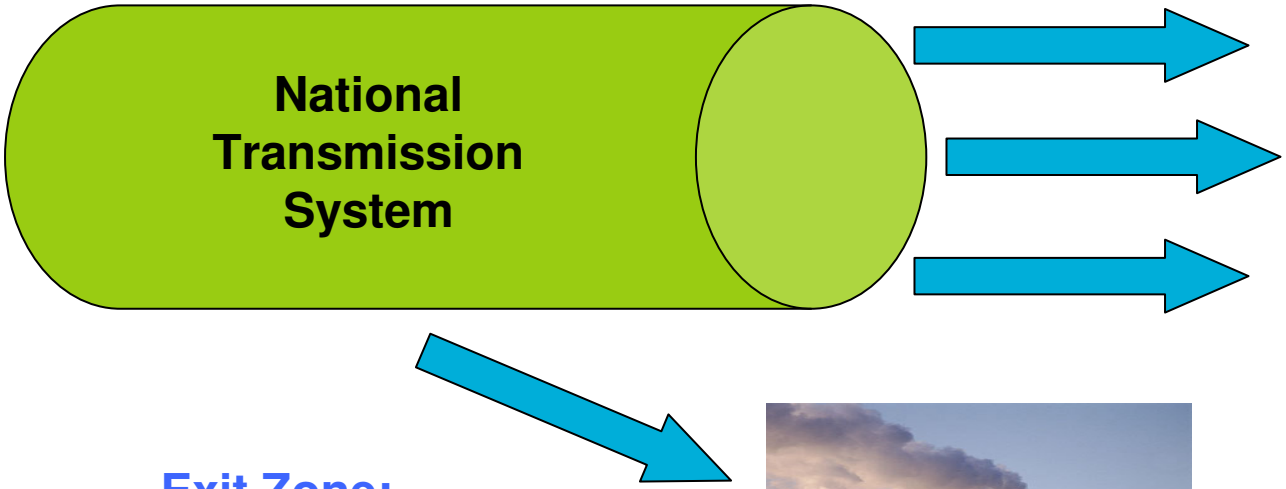
TO Exit Capacity Charges

- Set to recover 50% of allowed TO revenue set by Price Control Review
- Administered capacity charges
  - Based on baseline capacity at each exit point
- Charges are locational
  - Vary by each exit point
  - Relate to Long Run Marginal Costs (LRMCs) calculated by Transportation Model
  - LRMCs are adjusted to recover target exit revenue from baseline capacity levels
- Revenue associated with unsold obligated exit capacity recovered through TO exit commodity charges

NTS Exit Capacity Zones (Prevailing)

- NTS Exit zones comprise a group of DN offtakes. DN Supply Points are mapped to NTS Exit Zones
- End users supplied directly off the NTS form their own exit zone



Exit Zone: e.g. West Midlands

Distribution Network Offtake: e.g. Alrewas

Exit Zone:

NTS Offtake e.g. Didcot

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NTS Entry Capacity Charges - TO (& SO)

- Entry capacity sold through auctions
- 'Aim' to recover 50% of allowed TO revenue
- Different products offered:
  - Annual long term (15 years) auction - quarterly bundle (QSEC)
  - Annual monthly auction (AMSEC)
  - Monthly auction of remaining monthly capacity (RMTTSEC)
  - Daily firm capacity auction (DSEC)
    - Day Ahead priced at 2/3 AMSEC
    - Within Day Zero reserve price (Licence clearing auction obligation)
  - Daily interruptible capacity auction (DISEC)
    - Zero reserve price

  NB Within day DSEC and DISEC generate SO revenue
- Revenue shortfall recovered through TO Entry Commodity Charge

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Obligated & Incremental NTS Entry Capacity

- **Obligated NTS Entry capacity reserve prices set from the Long Run Marginal Cost (LRMC) of providing capacity.**
  - LRMCs calculated from a Transportation Model which is available to the industry
  - Obligated price calculated with the entry point flowing at the obligated capacity level
- **Incremental capacity step prices set from the change in LRMC from moving from the obligated level to the incremental level**
  - Usually twenty price steps (each step 2.5% baseline) for large terminals
  - Incremental revenue defined as SO revenue

NTS Entry Capacity: Auction Timetable & Reserve Prices

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Product	When?	Period Auctioned	Capacity Sold*	Reserve Price
QSEC	March	Oct year t+2 - Sept year t+17	Obligated less 10% (less QSEC sold in previous auctions) plus from 50% incremental from year t+3	Obligated Price + 20 Increments
AMSEC	February	April year t+1 - September year t+2	Obligated less QSEC sold less AMSEC previously sold	Obligated Price
RMTTSEC	Monthly	Month m+1	Obligated, less QSEC and AMSEC sold, plus capacity surrendered (traded) and unsold transferred from other ASEPs when applicable	Obligated Price
DSEC	Daily	Day d+1 - Day d+7	Unsold firm capacity	2/3 Obligated Price
		Day d	Unsold firm capacity	Zero
DISEC	Daily	Day d+1	Firm capacity held less actual gas flow allocations + discretionary	Zero

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*scope for selling non-obligated capacity

Capacity Charges: The Transportation Model

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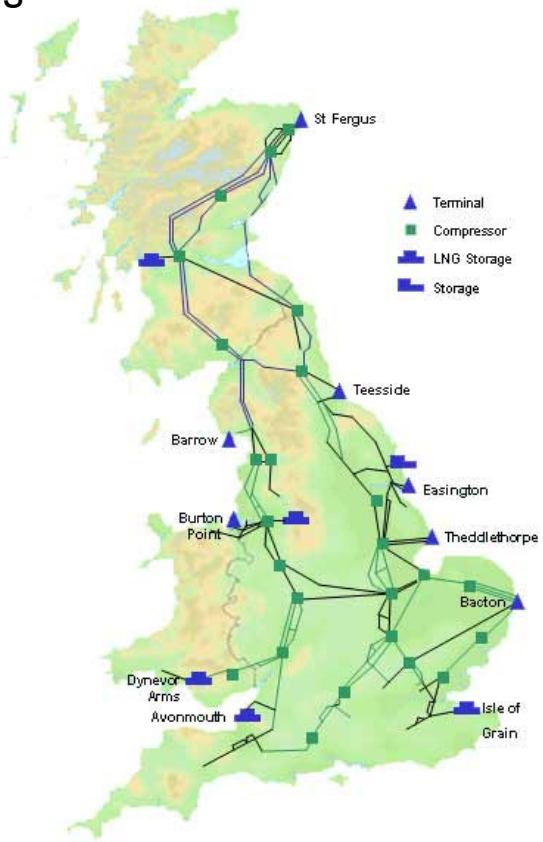
- The NTS Transportation Model, available to the industry, is a Microsoft Excel spreadsheet run using Microsoft Excel Solver and Macros
- Calculates:
  - NTS Exit Capacity charges
    - Administered to recover allowed revenue
  - NTS Entry Capacity auction reserve prices
    - Long Run Marginal Cost
- Inputs are:
  - Forecast 1-in-20 peak day supply and demand data
    - Direct Connection (DC) & Distribution Network (DN) offtake demands
    - Aggregate System Entry Point (ASEP) supplies
  - Obligated capacity levels
  - Transmission pipelines between each node (km)
  - Expansion Constant (£/GWh/km) to calculate costs
  - Anuitisation Factor to calculate prices



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SO Transportation Charges

- **Incremental Entry & Exit Capacity**
  - Incremental Exit capacity charges are calculated in exactly the same way as baseline Exit capacity charges (TO)
  - Incremental Entry charges use the change in LRMC from moving from the obligated level to the incremental level
- **St Fergus Compression**
  - Applicable where gas is delivered at lower than normally expected pressures. Charge is cost of additional fuel per unit throughput. (applies at Total entry point only)
- **Optional Commodity (Short haul)**
  - Reflects cost of building and operating an alternative pipe. Avoids inefficient by-pass.
  - Applicable for a defined entry and exit point. Charging function dependent on exit point capacity and distance to entry point.
  - Replaces both entry and exit SO Commodity and TO entry Commodity.
  - Only attractive for large supply points situated close to terminals i.e. those that might otherwise by-pass the NTS.
- **Standard Commodity**
  - Collects SO allowed revenue less revenue from other charges
  - Applies at the same rate to both entry and exit flows at all NTS system points but does not apply at storage facilities.

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SO Transportation Credits

- **Constrained LNG (CLNG)**
  - These are payments to shippers holding gas in strategic LNG facilities to meet peak demand when demand is in excess of pipeline capability

Under/Over Recovery (“K”)

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Over and Under Recovery Licence Terms

- Not always possible to ensure actual revenues collected exactly meet allowed revenues
- If {actual revenue - allowed revenue} is negative in the previous year, the allowed revenue in the current formula year is increased
  - Under-recovery attracts an “average” base interest rate denoted by I_t (PI_t is set at zero)
- If positive, the current year’s allowed revenue is reduced
  - Over-recovery attracts a penalty of 3% above the average base interest rate (PI_t is set at 3)

$$TOK_t = (TOR_{t-1} - TOMR_{t-1}) \times \left(1 + \frac{I_t + PI_t}{100}\right)$$

$$SOK_t = (SOR_{t-1} - SOMR_{t-1}) \times \left(1 + \frac{I_t + PI_t}{100}\right)$$

Over and Under Recovery Obligations

- NGG must use best endeavours to ensure that (for each of the TO and SO Controls)
  - In any formula year actual revenues are not more than 4% above allowed revenues
  - In any two successive formula years, actual revenues over the two years do not exceed the allowed revenues over the two years by more than 6% of the allowed revenue in the second year

Special Condition C8B 1 and Special Condition C8C 1

SO Over and Under Recovery

- SO commodity normally only adjusted twice per year.
  - 1st October and 1st April
  - Can be adjusted more frequently in exceptional circumstances
- As the major SO cost component is shrinkage, within year fluctuations occur due to gas price variation and volume uncertainty
  - Own use gas (OUG) driven by compressor usage is predictable
  - Un-accounted for gas (UAG), largely due to meter error, is unpredictable
  - A potential charging methodology development area
- BUT…
- TO entry revenues are dependent on auction outcomes which are difficult to predict.

TO Entry Over and Under Recovery

- TO exit revenue relatively stable under the prevailing arrangements since charging base (Capacity) predictable.
- TO entry revenue is more of a problem due to difficulties forecasting auction revenues.

1. **Entry capacity buyback offset mechanism**
   - Credit to entry charges to offset neutrality buy-back costs.
   - Buy-back costs have been low, in recent years, and so revenue return cannot be guaranteed through this mechanism.
2. **TO Entry Commodity Rebate.**
   - Rebates some or all of the TO commodity charge (set to recover any anticipated shortfall in TO revenues) at the end of the financial year.
3. **TO Entry Commodity Credit**
   - Pays a TO commodity credit at the end of the financial year if the TO Entry Commodity charge has been fully rebated.

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Incremental Capacity & Revenue Drivers

NTS Capacity Investment Incentive Schemes

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- **National Grid incremental allowed revenue**
  - Additional obligated entry capacity above prevailing obligated level that is not met by substitution
  - Revenue drivers by location in Licence
- **Capacity Release**
  - Entry - NPV of QSEC auctions bids > 50% of deemed project cost
  - Exit – Commitment to pay exit capacity charges subject to the advanced reservation of capacity agreement (ARCA) and for 4 years from 2012.
- **How do the Entry & Exit incentives work?**
  - 5 years incentive revenue from first month of release
  - After the 5 year incentive period reclassified as non-incremental obligated capacity
    - Depreciation and return for next 40 years as part of TO price control (subject to efficiency test) on any investments
    - National Grid may contract rather than invest: Investment decisions based on network analysis and risk assessment

NTS Capacity Investment Incentive Scheme - Example

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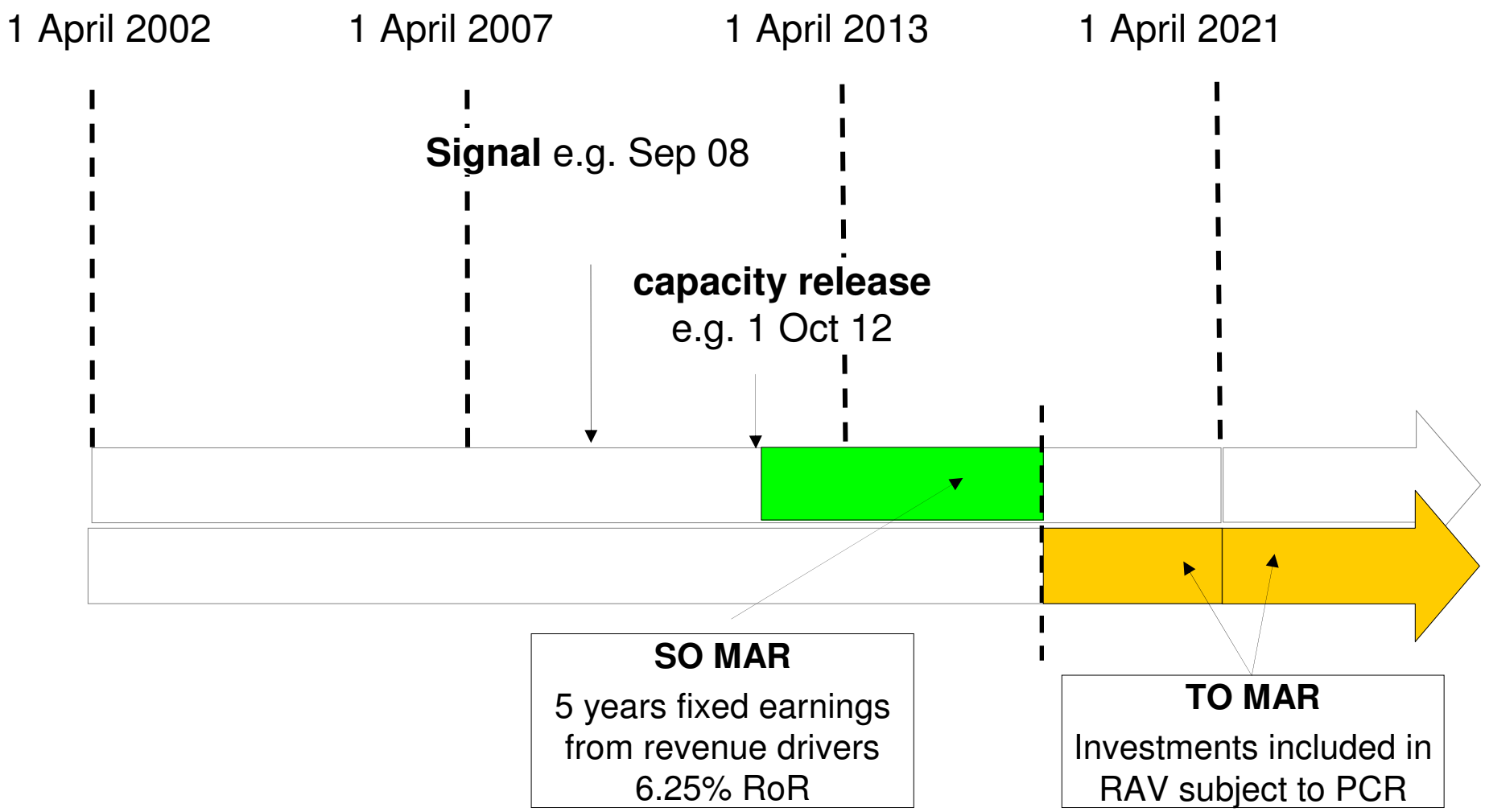

- **For the latest prices:**

http://www.nationalgrid.com/uk/Gas/Charges/statements/

http://www.gasgovernance.co.uk/ntscharges

- **For the quarterly charge setting reports including allowed revenue:**

http://www.nationalgrid.com/uk/Gas/Charges/Tools/

- **For the NTS Charging Methodologies Forum:**

http://www.gasgovernance.co.uk/ntscmf

- **For UNC Proposals (which may effect the charging methodologies)**

http://www.gasgovernance.co.uk/livemods