National Grid Gas - Transmission System Operator Review

Neil Pullen
Gas Operations Manager

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Role of the System Operator

Accountable for:

- The safe and efficient control and operation of the UK Gas Transmission System, ensuring safe pressures are maintained across the NTS, and System Entry and Exit capacity availability is maximised

- This translates into the following key daily activities:
  - Residual Balancer – “light touch” role
  - Compressor optimisation
  - Management of Capacity on the Network
  - Maintaining UK gas quality
  - Facilitation of Commercial Daily Trading arrangements
  - Provision of market information

- Incentivised to balance and trade efficiently

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Role of System Operator

Most operational issues are associated with one or more of the following problems:

- Too much gas.
- Not enough gas.
- Gas in the wrong place.
- Not enough transportation capability.
- Gas of insufficient quality.
- Information uncertainty.

Operational issues constantly change as physical and commercial factors change

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Evolution of the NTS and Supply Sources

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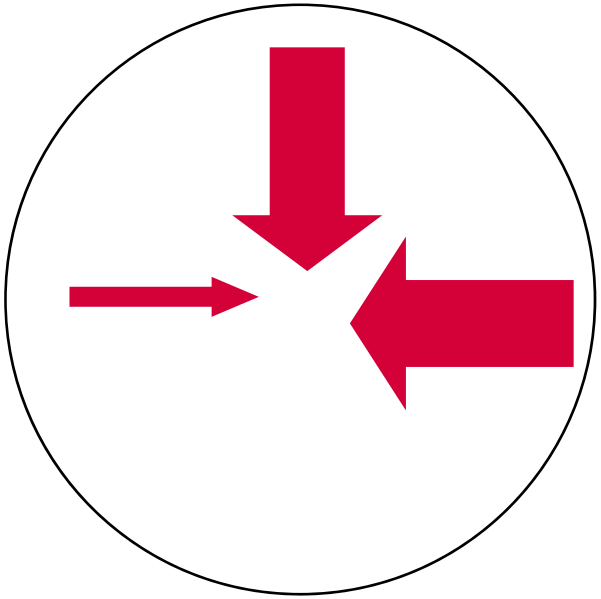
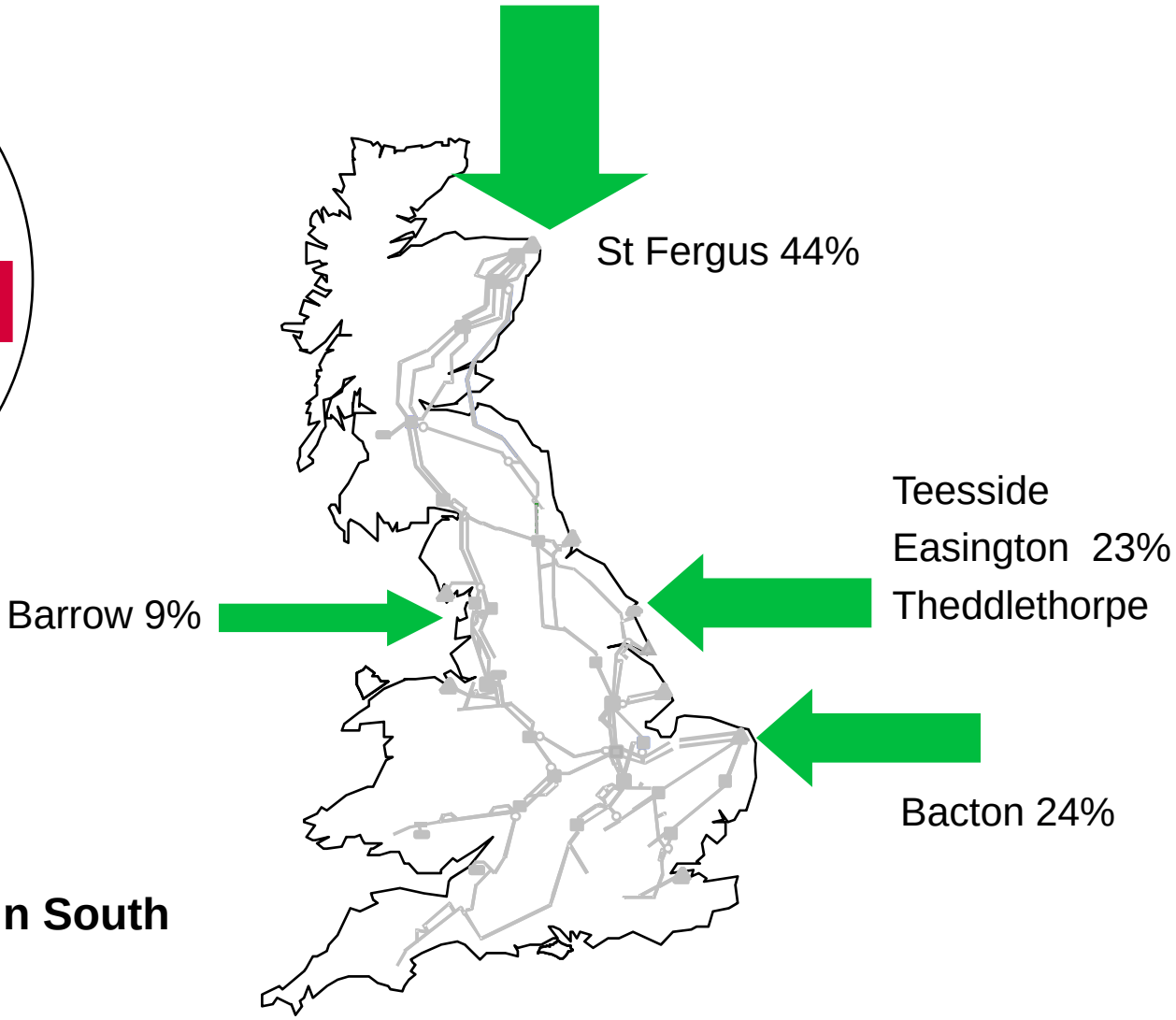
UK Annual Supply 2005





50% of demand in South

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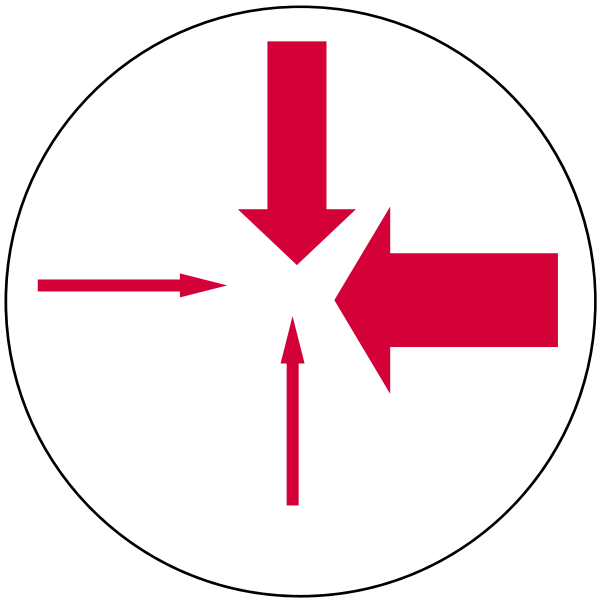
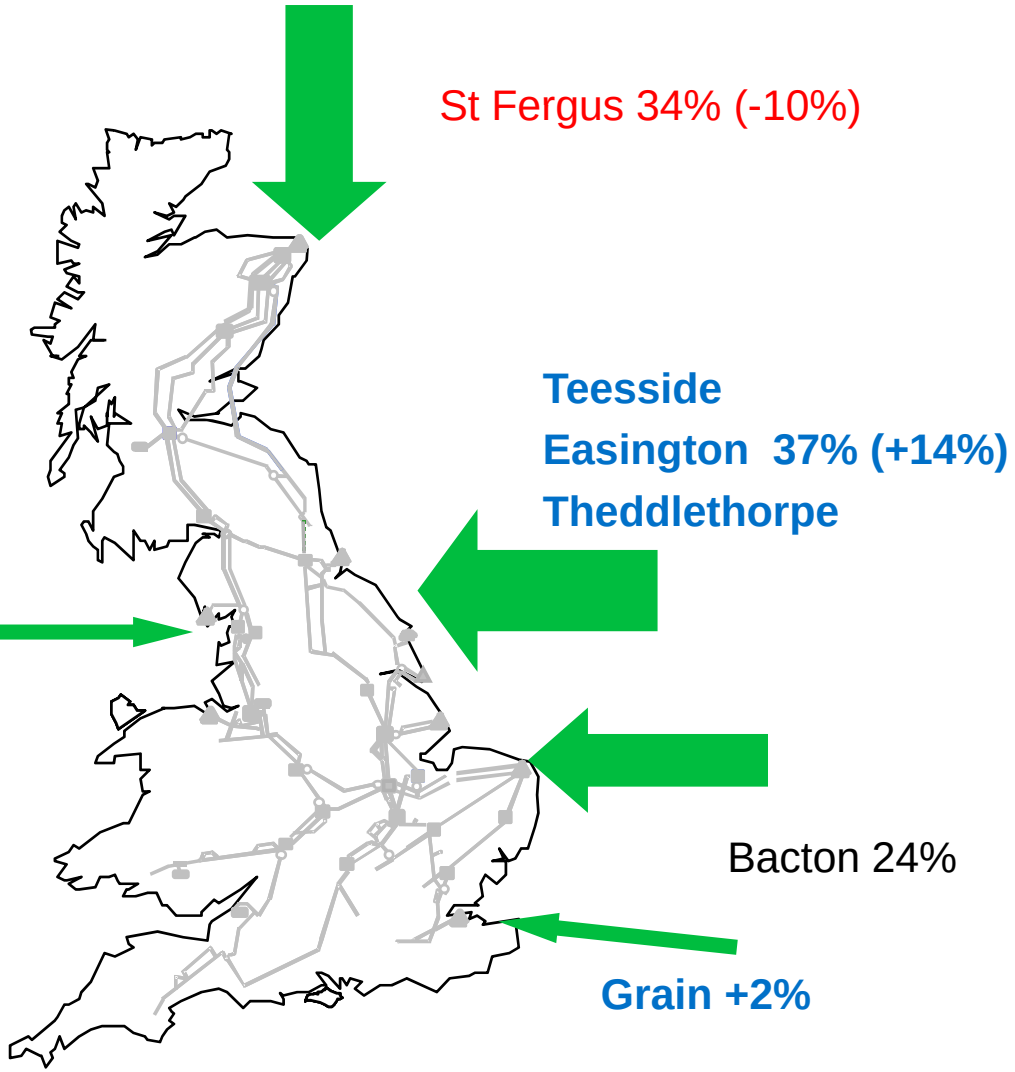
UK Annual Supply 2007





50% of demand in South

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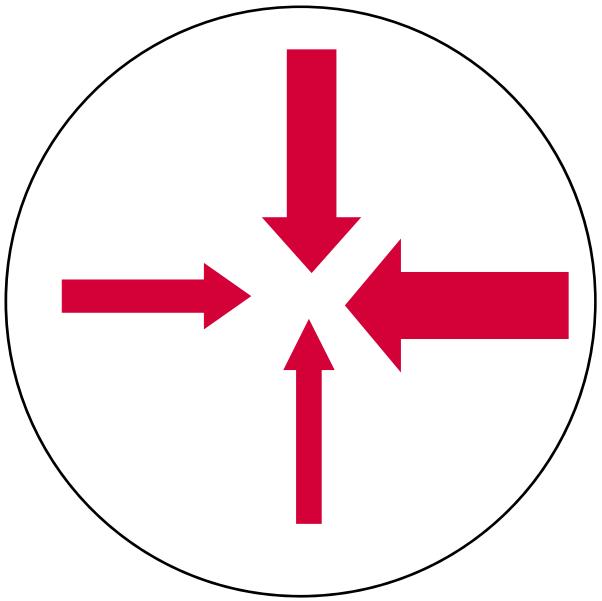
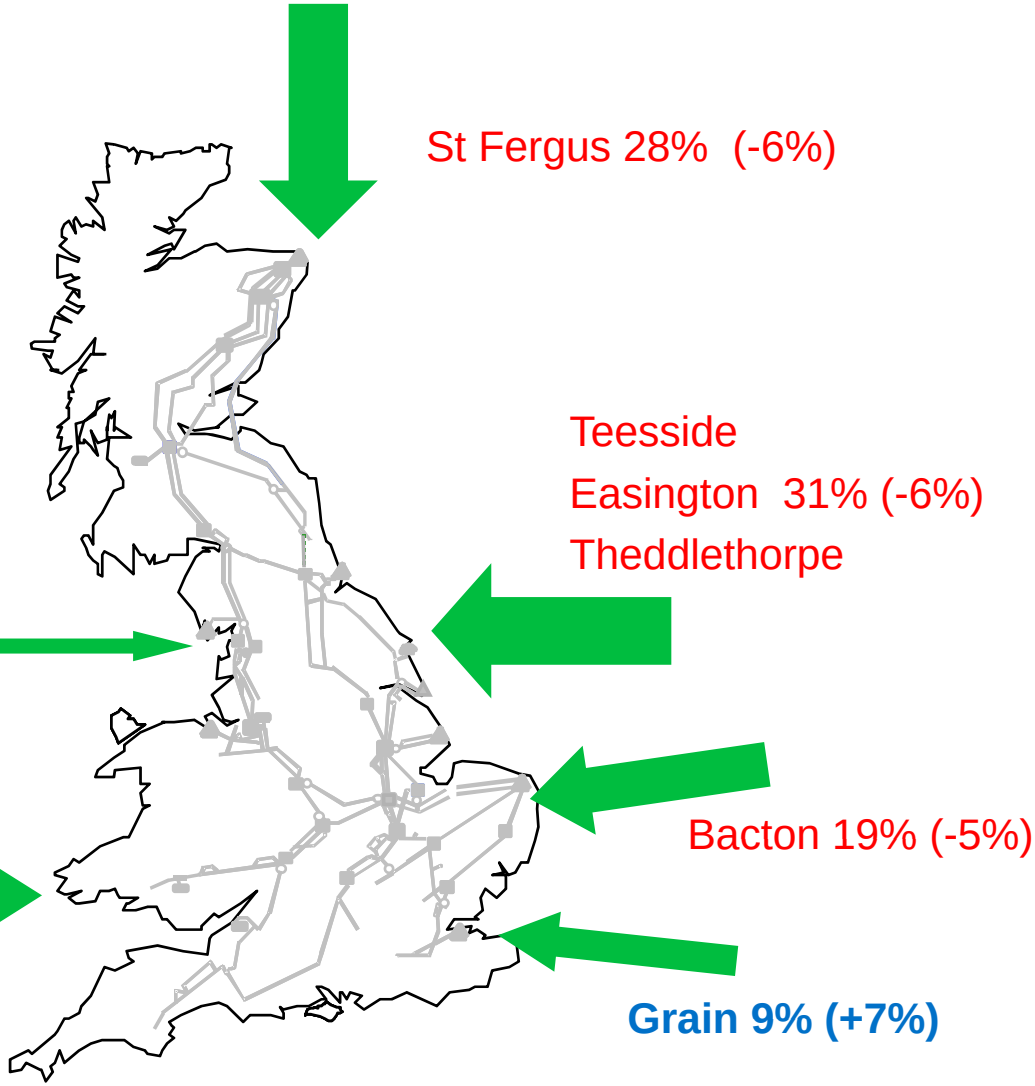
UK Annual Supply Forecast 2012





50% of demand in South

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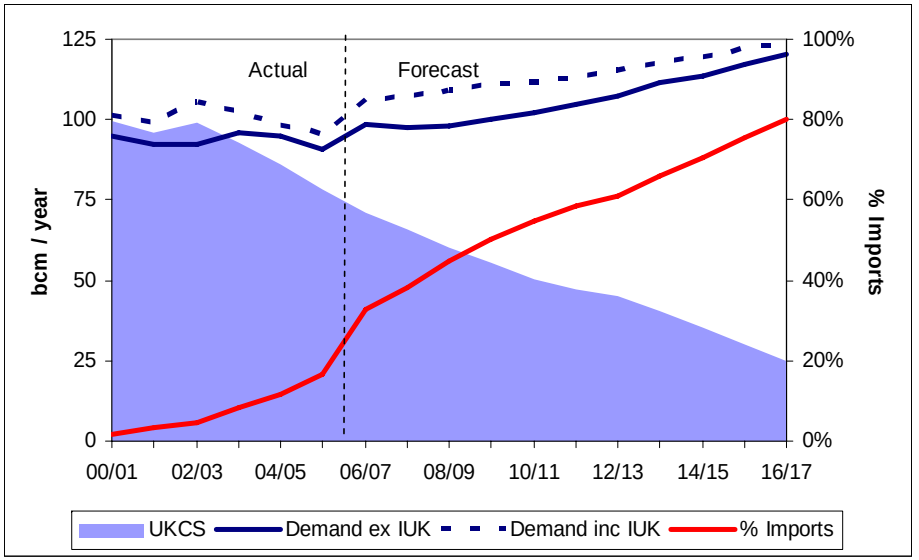
Changes seen to date..

- UKCS supplies in decline, and now insufficient to even meet typical summer demand
- Imports from Europe and LNG increasing (~40%)
- Level of supplies influenced by European (ie Interconnector) and worldwide gas demand (ie LNG), and prices
- Less predictable supply pattern and increased within day flow variations
- Revisions to Entry Capacity Regime
- Gas quality more variable and less predictable and much closer to GS(M)R limits



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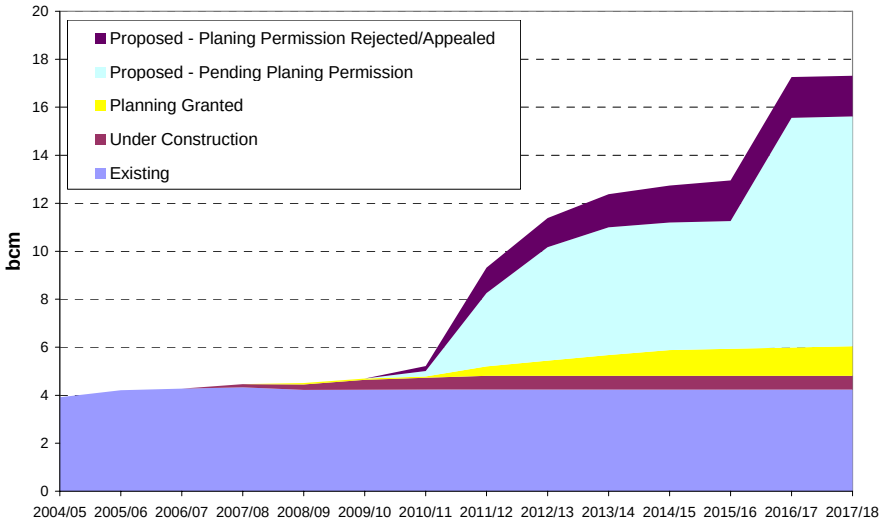
..and more expected in the future

- Increasing CCGT demand
  - further Gas and Electricity interactions
- More Storage – increasing dynamic use
- Challenge of multi-transporter system operations and incentive interactions
- Increasingly complex transmission capacity management across SO and TO functions
- World energy markets
- Ongoing challenge of UK remaining attractive on the world stage



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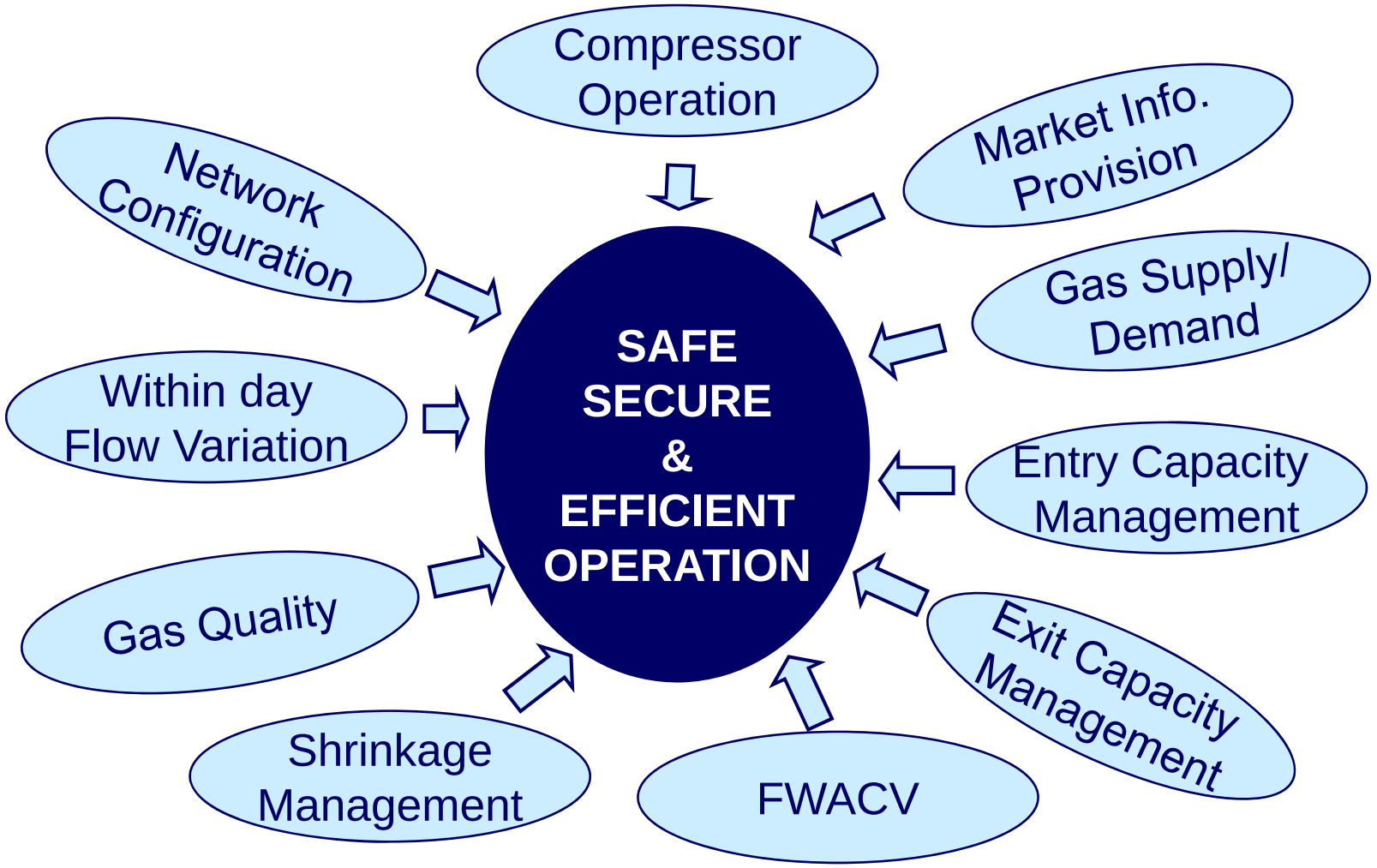
System Operation “Day Job”



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Impact on key operational output measures – some real examples

Compressor Operation – Meeting all pressure commitments

Linepack Management

Pressure Management - MPOP

Transmission Capacity Management

As a consequence of

- Notice period rate change
- Within day change to nomination / DFN
- Flow Variation away from nomination

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Compressor Operation

- Tighter limits on emissions leading to installation of more compressors with electric drives.

- Unpredictable flow patterns and increased within day flow variations combined with the requirement to maximise capacity results in compressors having to be operated in inefficient mode.

- Increased efforts being made to optimise compressor operation and reduce emissions, but….

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Example of within day flow variation
20th July 2007

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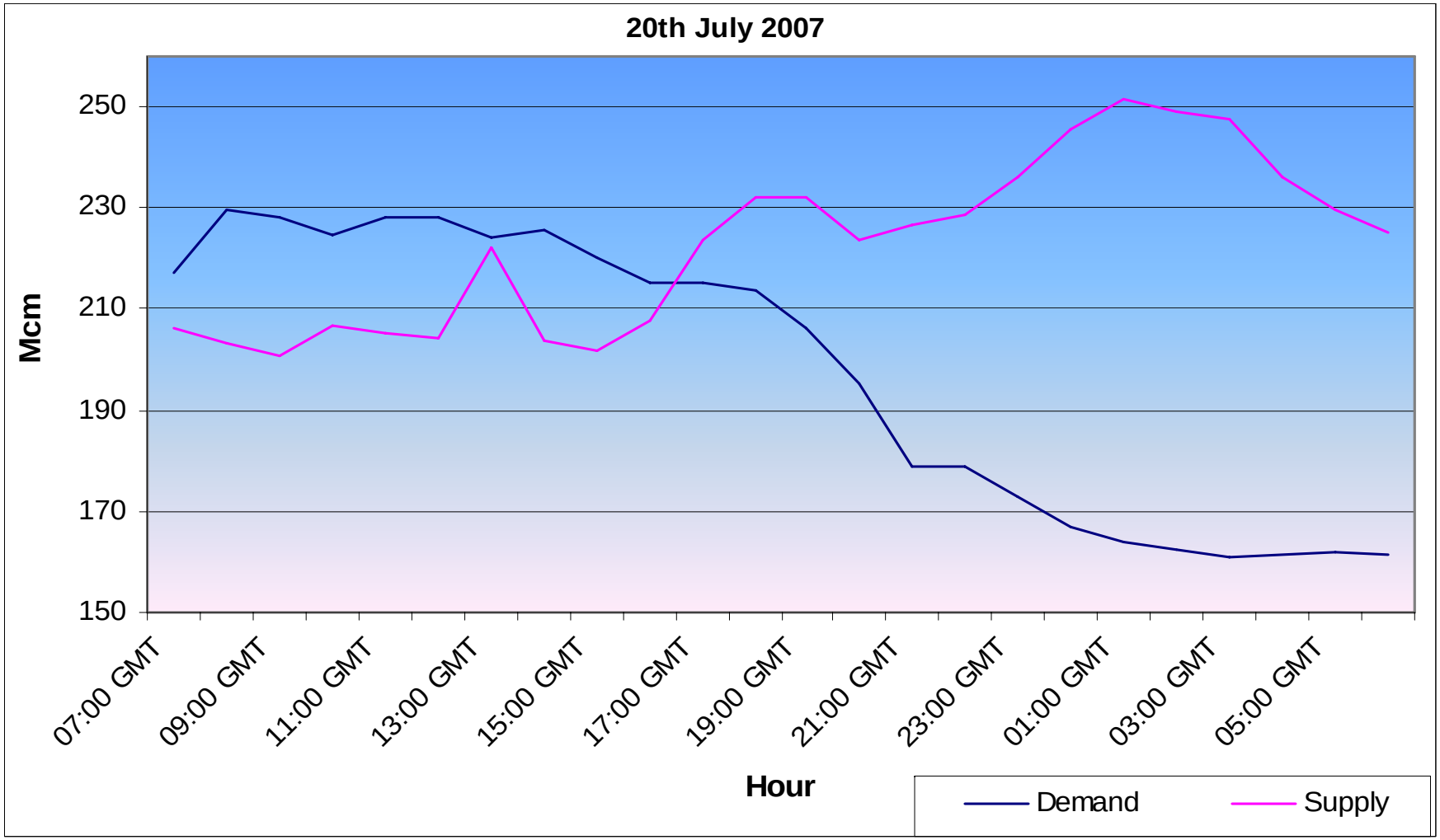
Example of within day flow variation (1)



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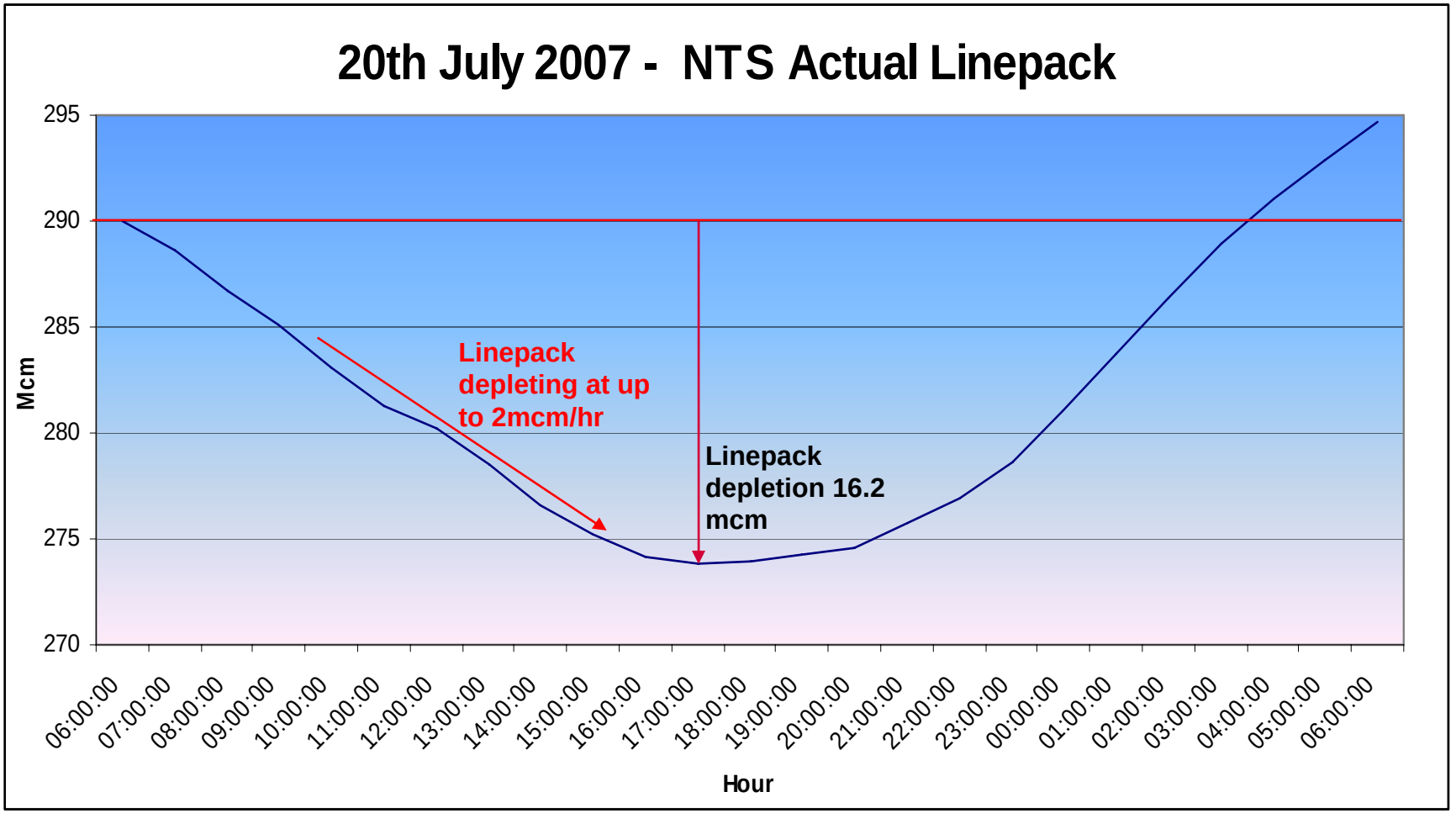
Example of within day flow variation (2)



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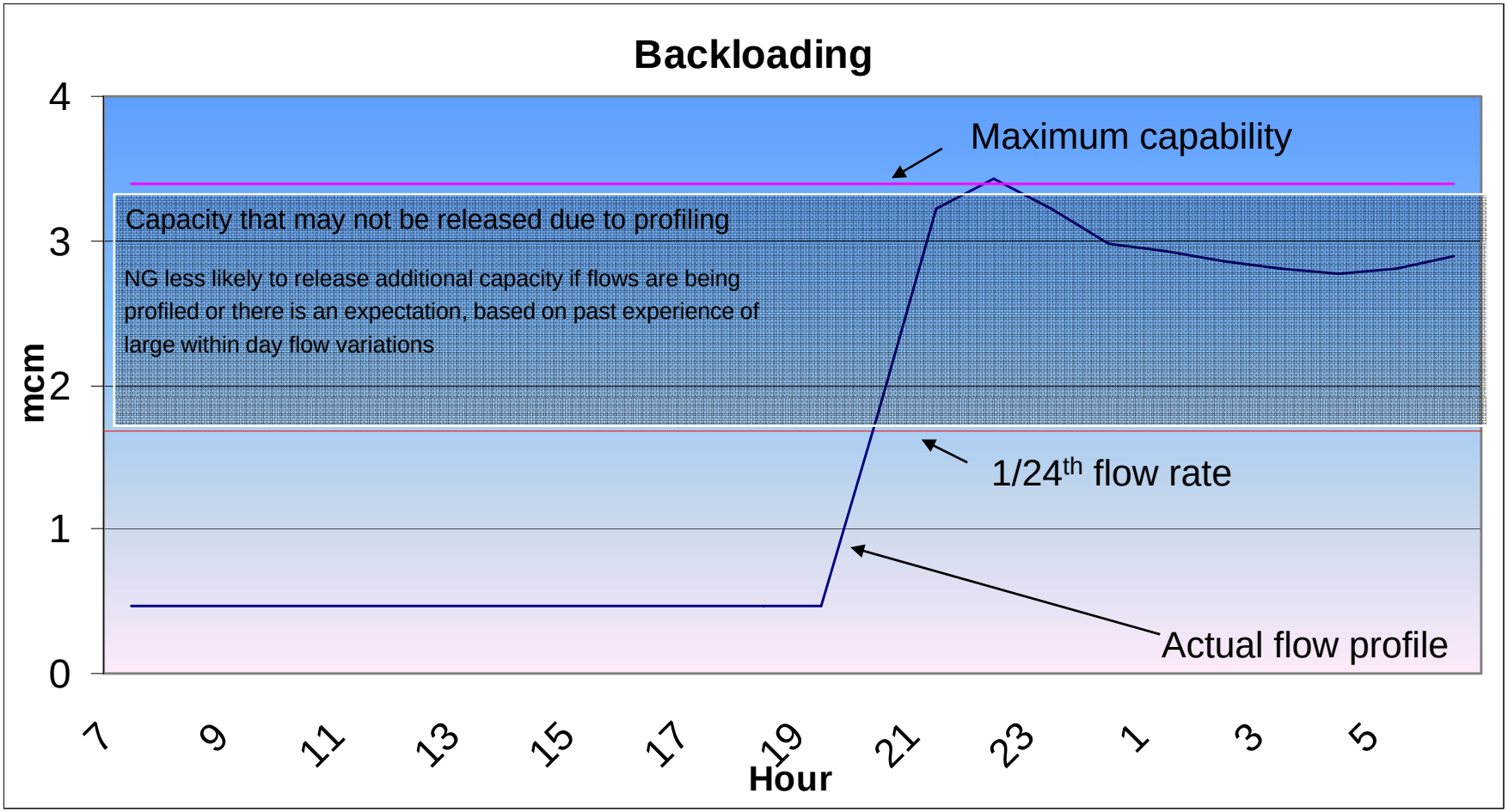
Impact on Capacity Release - Backloading



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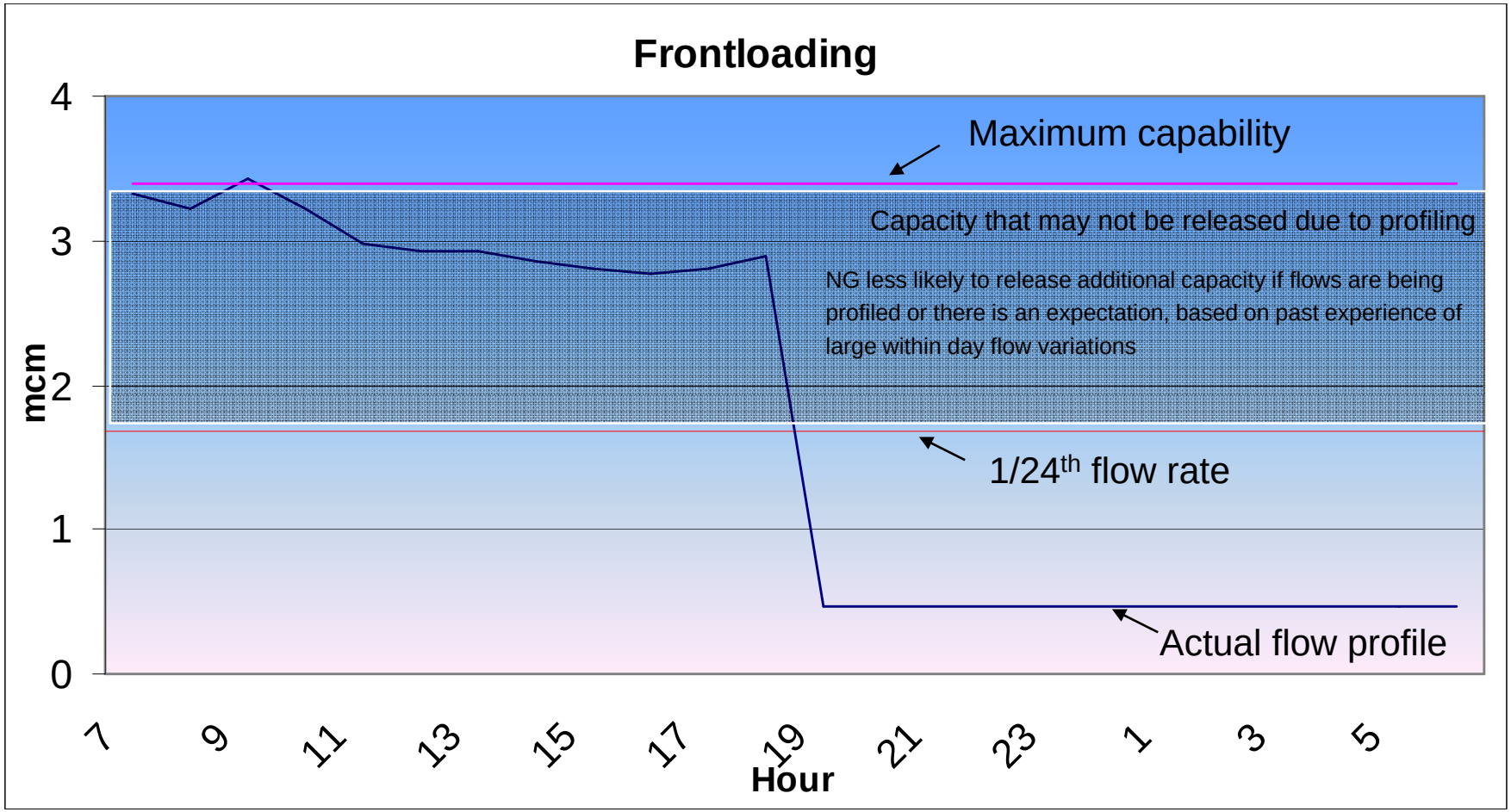
Impact on Capacity Release - Frontloading



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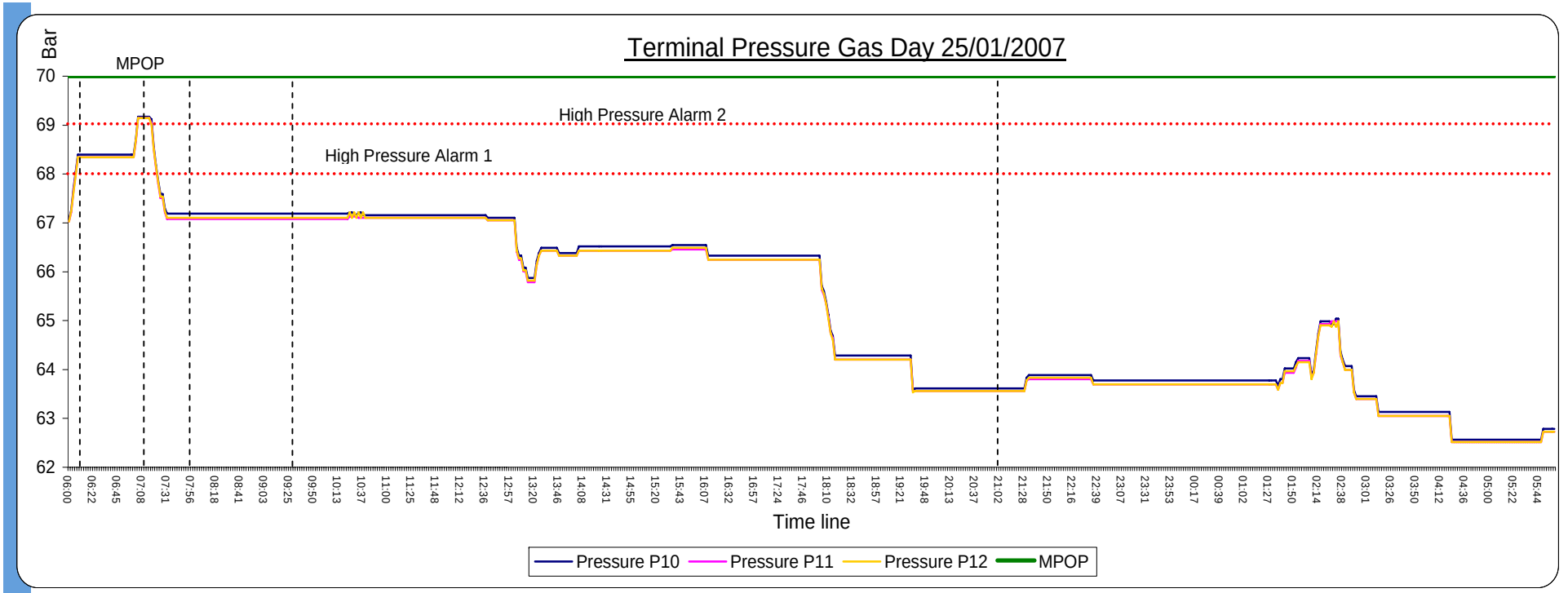
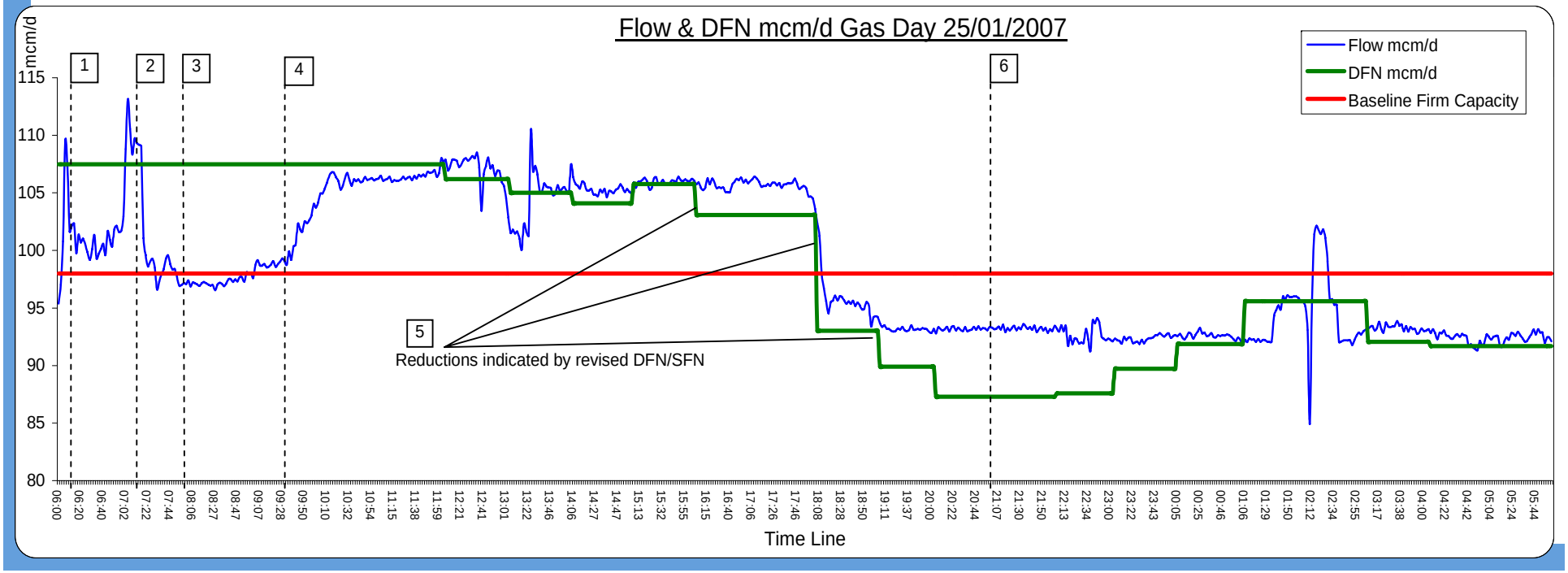

Terminal Pressure Gas Day 25/01/2007
Bar
MPOP
High Pressure Alarm 2
High Pressure Alarm 1
Time line
Pressure P10
Pressure P11
Pressure P12
MPOP


Flow & DFN mcm/d Gas Day 25/01/2007
mcm/d
1
2
3
4
5
6
Reductions indicated by revised DFN/SFN
Flow mcm/d
DFN mcm/d
Baseline Firm Capacity
Time Line

So what does this mean for the SO review?

Mark Brackley

Regulatory Frameworks Manager - Gas

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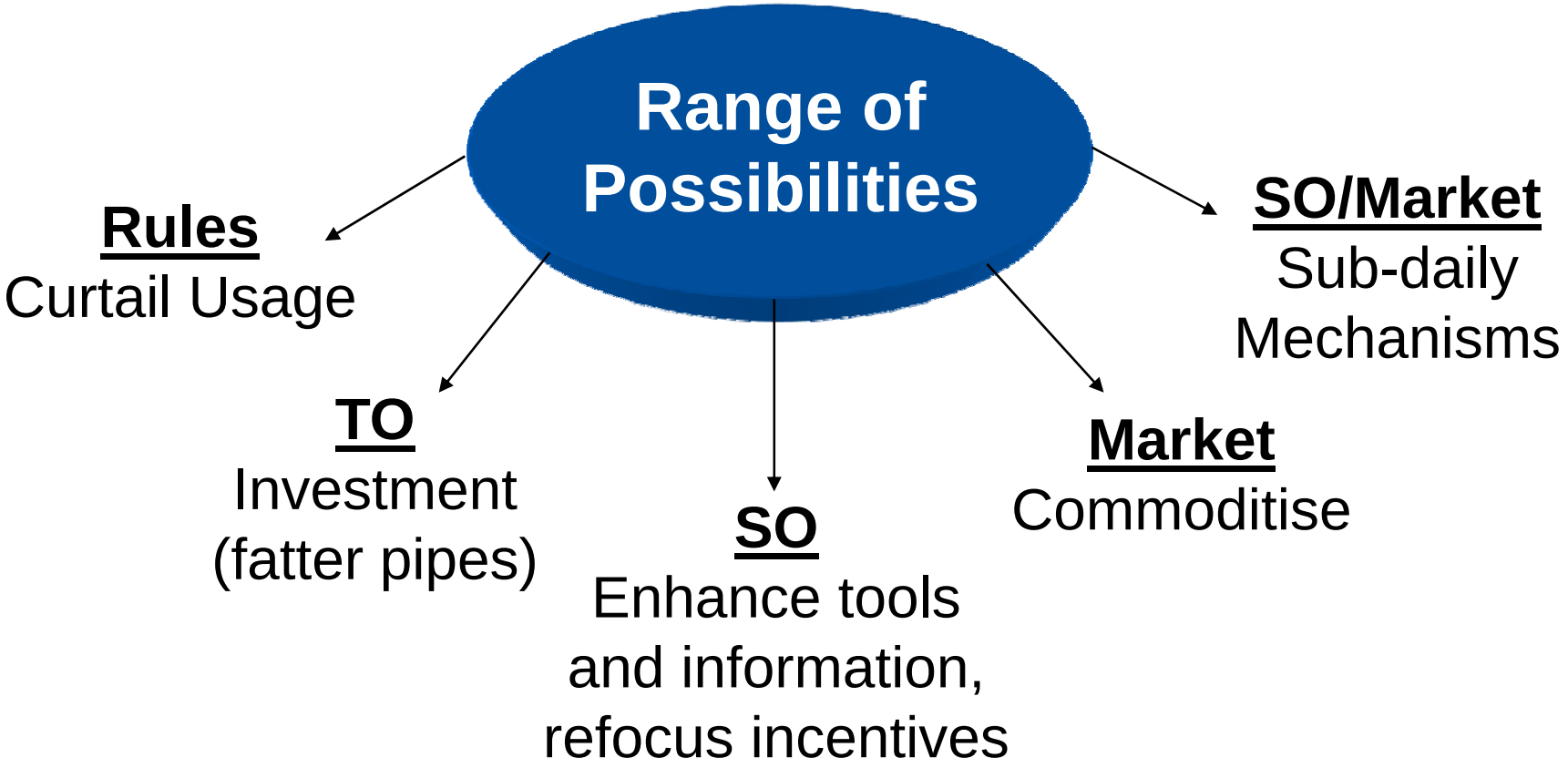
Not sustainable in the long term



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Current SO Incentives

Formula Year 2007/8	Cap	Collar	Years Left from April 2007
System Balancing - Shrinkage	4	-3	1
System Balancing - Operating Margins	none	none	1
Residual Gas Balancing **• Price Performance** **• Linepack**	3.5	-3.5	1
Information Systems Performance	1.5	0	1
Demand Forecast Performance	none	-1.6	1
Entry Capacity Operational Buyback	18	-18	2
Exit Capacity Buyback and Interruption	0	-7	4½
Entry Capacity Incremental Buyback	0	-36	5

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Multi-year Incentives

- Unlike in electricity, not all incentivised areas rely upon forecasts of costs
- History of longer term incentives in gas
- Benefits in agreeing incentives for more than one year
  - Certainty for all parties over incentive arrangements
  - Some incentives (e.g. shrinkage) based around procurement ahead of the ‘formula year’
  - Potential for lower costs through longer term contracts/trading
  - Opportunity for investment with longer pay-back periods e.g. forecasting tools, Information systems investments
- Doesn’t have to be ‘all or nothing’ - potential to agree elements of incentive arrangements for multiple years where appropriate

Summary

- Gas supply sources into the UK are changing
- Changing use of the NTS
  - Much more dynamic
- Not sustainable in the longer term
  - Historically network not built to deliver this
- SO Review opportunity to establish a direction
  - Industry views on what you need from the SO
- Ensure SO role and incentives is aligned with what the market needs

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