



Future needs of the Gas Transmission System

Introduction to Speakers

Jennifer Pemberton

- Stakeholder Strategy Manager

Bridget Hartley

- Gas Transmission Owner RIIO2 Manager

Jenny Phillips (St Fergus/Chester)

- Gas System Operator RIIO 2 Manager

John Perkins (London)

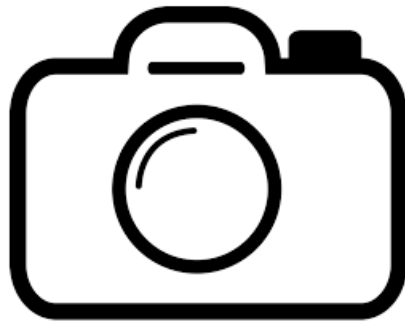
- RIIO-T2 Strategy Delivery Manager

Richard Pickup (Bacton)

- Gas Network Manager



Housekeeping



Safety Moment



Quick Poll

- What three words would you use to describe National Grid Gas Transmission?

Poll - to help us analyse your answers...

- *Which of the following best describes you / your organisation regarding your role here today?*
 1. Customer, i.e. your organisation pays National Grid directly
 2. Consumer interest organisation
 3. Regulator or government (central or local)
 4. Energy network owner or operator
 5. University, think tank or academic
 6. Supply chain
 7. Environmental interest organisation
 8. Other energy industry
 9. Other non-energy industry

Poll - Knowledge of our operational activities

- *On a scale of 1 to 5, where 1 is know nothing and 5 is know a great deal, how much would you say you know about National Grid's operational activities?*

1. Know nothing
- 2.
- 3.
- 4.
5. Know a great deal

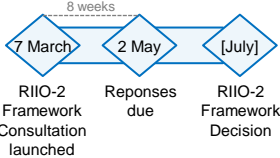
What is RIIO?



Timeline

2018				2019				2020				2021
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Jan/Feb/Mar	Apr/May/Jun	July/Aug/Sept	Oct/Nov/Dec	Jan/Feb/Mar	Apr/May/Jun	July/Aug/Sept	Oct/Nov/Dec	Jan/Feb/Mar	Apr/May/Jun	July/Aug/Sept	Oct/Nov/Dec	Jan/Feb/Mar

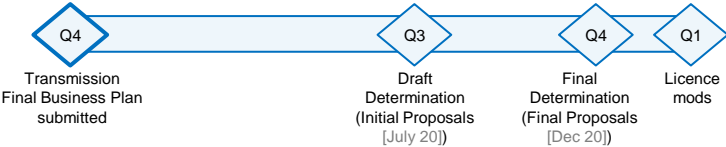
RIIO Framework Review



T2 Specific



GT Business Plan



Start of RIIO-2

1

Listen
Establishing Stakeholder priorities To shape our future Engagement plans

Co-create
Building elements of our plans with stakeholders - Getting into detail

Propose
Sharing our plans with stakeholders to make sure we check we're meeting their needs

Scrutinise
Detailed scrutiny and integrating plans with stakeholder groups

Agreement
The final business plans submissions and stakeholder group reports re reviewed, and Ofgem publish their price control determination by the end of 2020

RIIO T2
New Price Control Starts

Stakeholder User Group Meetings

Ofgem Challenge Group Meetings

A message from Phil Sheppard



Why we're here today

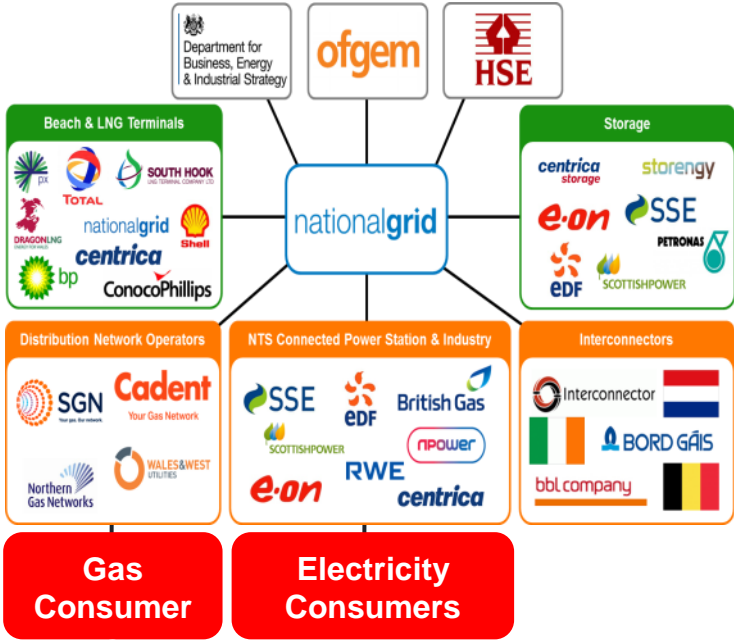
We know

Our customers and stakeholders rely on the service we provide

We haven't always spent enough time listening to your priorities

We're changing

To ensure your requirements are at the centre of our business plans



Please join the debate

We are at a time of significant change in the energy industry, and the vital role that gas plays will need to **evolve**

Today's workshop is focused on areas which you've already told us are important and which will directly **influence** our business plans

We are committed to **listening** to you, our customers and stakeholders, to develop the Gas Transmission Network you require for today and tomorrow

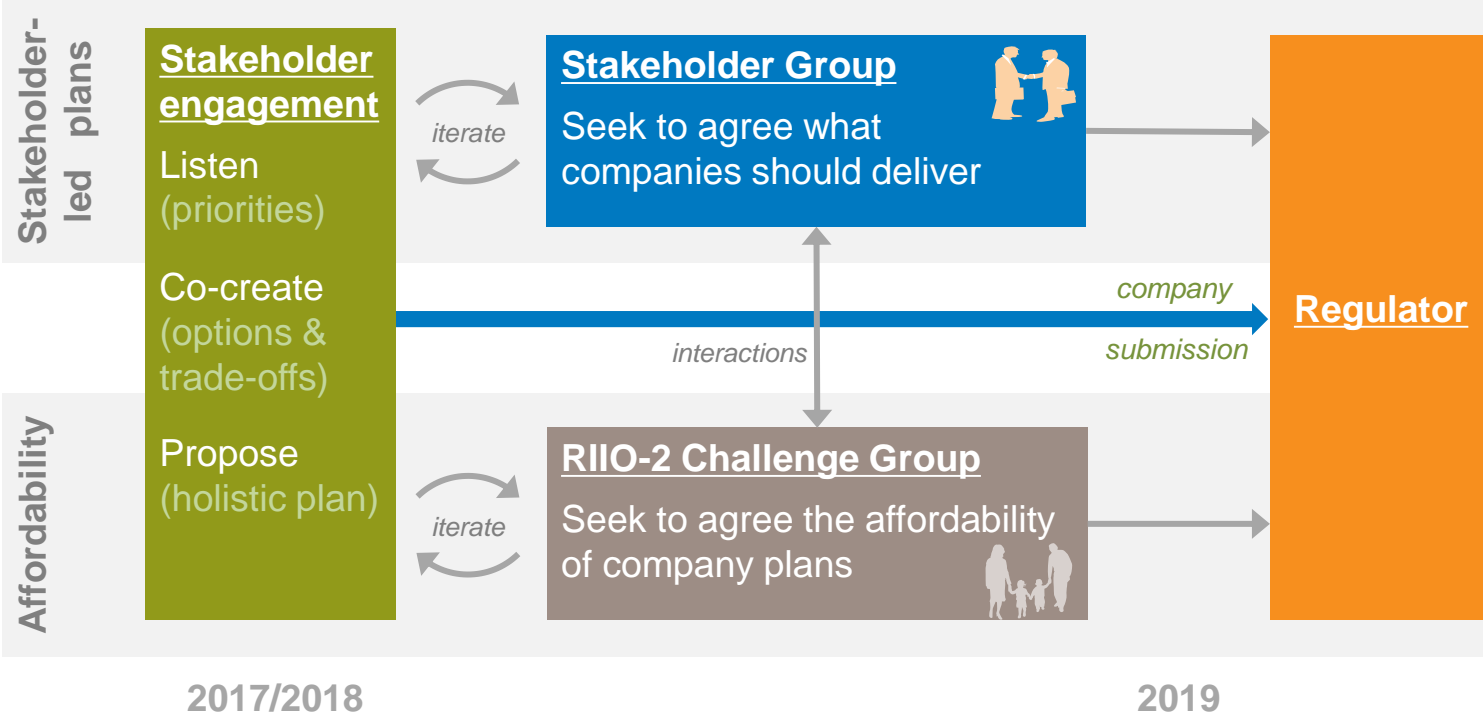
Take part
Have fun
Be honest and direct

Our engagement approach

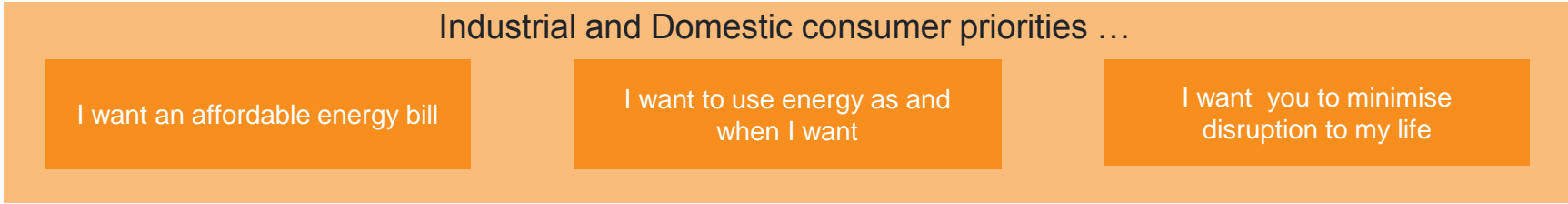
- Today is part of a wider programme of stakeholder engagement to help us build our business plans for RIIO-2

- This involves:
 1. listening to what you need from us
 2. creating our plans with you
 3. then checking that our plans reflect what you've told us

Constructive engagement



Gas Transmission Stakeholder Priorities



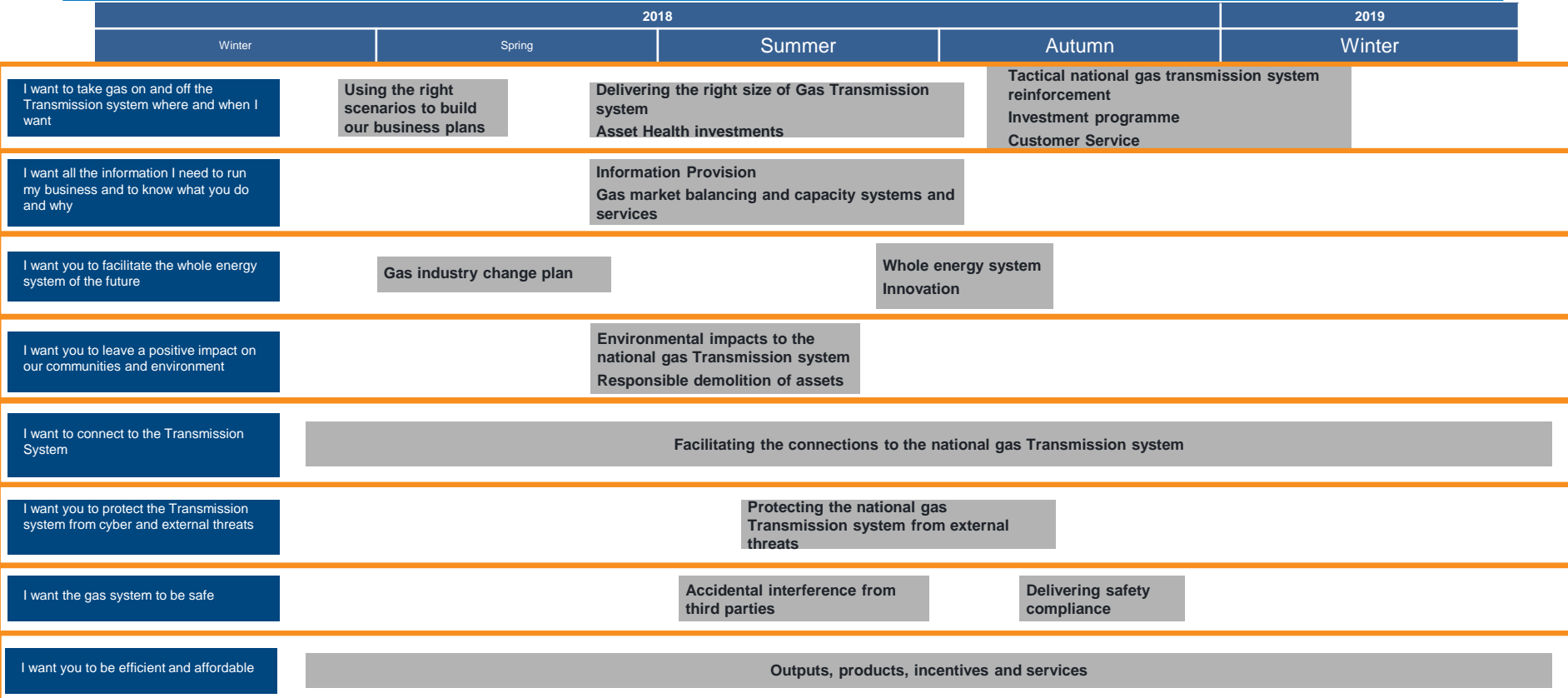
...are delivered through our stakeholder priorities...



...these were developed by consulting with



Timeline of engagement



Today's Agenda

Morning

- Future of gas
- Who we are and what we do
- Our Performance
- Scenarios – Our planning assumptions
- I want to move gas on and off the network

Lunch

Afternoon

- Asset management
- Responsible removal of redundant assets
- Information provision

Future of Gas

How gas can support
a low carbon future

- Jenny Phillips

Gas plays an important role in the economy today

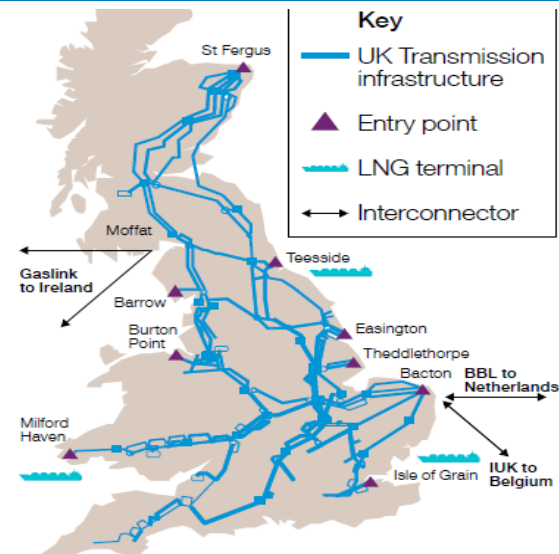
7,660km	Of gas pipelines through the GB National Transmission System
60,000	New customers connected to the gas networks each year
96,000	Gas connections have been made since 2007 to address fuel poverty
42%	Electricity generated from gas in 2016
8/10	UK homes use gas for heat

The gas networks deliver three times the energy delivered by the electricity networks.

Gas	888TWh	Total Demand 2016/17
Electricity	284TWh	

Climate Change Act 2008

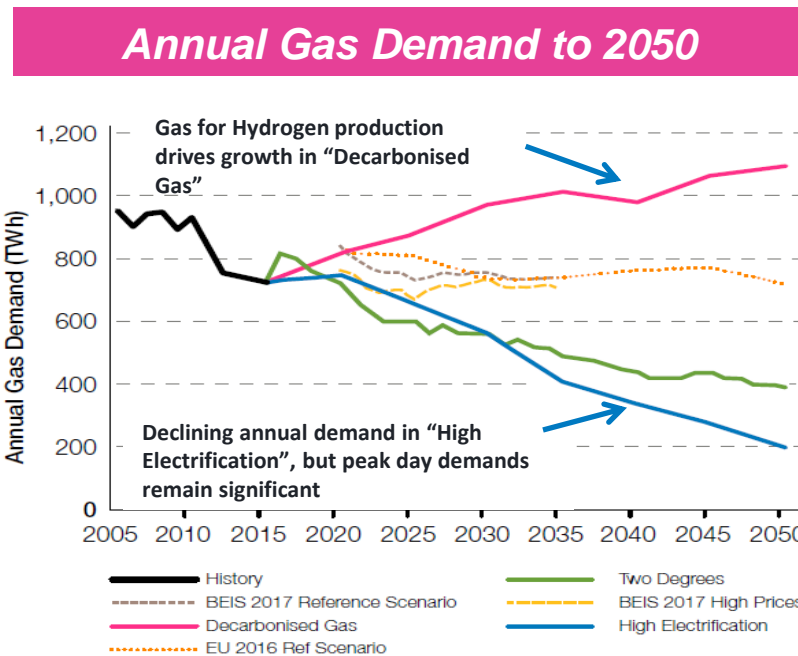
The Act requires the UK to have reduced carbon emissions by at least 80% by 2050 from 1990 Levels, whilst maintaining security of supply and providing energy at lowest cost



Future of Gas programme set out to:

- Understand customer & stakeholder views to set out what the future holds for gas
- Understand the potential future impacts on our network and the gas market
- Develop policy recommendations to support government and regulators
- Consider innovative solutions to future challenges

Stakeholder engagement and 2050 analysis has ^{nationalgrid} shown gas was important in all sensitivities



Circa 150 different organisations involved

We have presented a series of key themes

Decarbonisation of Heat

Demonstrates why gas is the ideal solution for decarbonising residential and commercial heat



Decarbonisation of Transport

Discusses why decarbonising transport through gas (and electricity) should be an early priority



Decarbonisation of Industry

Demonstrates why decarbonising the gas sector is the best option for much of GB industry



Whole Energy System

Establishes why the ability to work across all energy systems will become much more important



Future Networks & Markets

Discusses the products and services needed to facilitate the networks and markets of the future



Carbon Capture Usage & Storage

Maintains that CCUS plays a critical role if decarbonisation is to occur at the lowest possible cost



We will set out:

The challenge & potential solutions

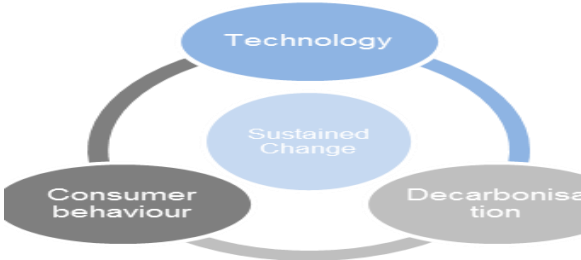
What National Grid will do

No regrets actions
Signposts/triggered actions

A potential timeline for policy decisions and actions

Our public policy recommendations

Next steps

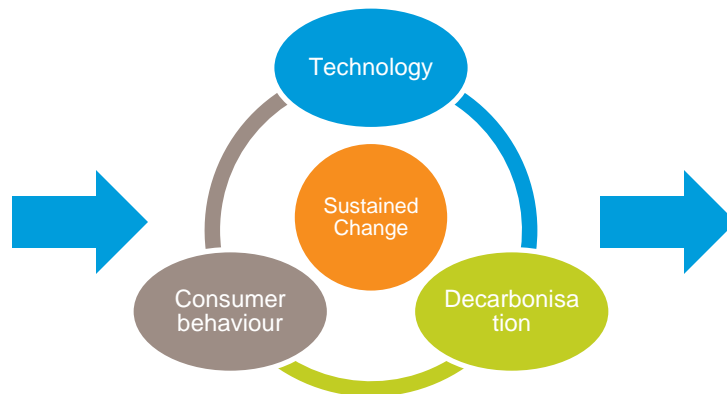


Continue the conversation with our stakeholders and further our policy recommendations

Deliver the National Grid committed actions as well as defining the market triggers for potential future work

Develop a Gas Industry Change Plan to take the next step in our future gas thinking, by establishing a long term, stakeholder backed programme of strategic change

Gas Industry Change Plan



Draft Gas Industry Change Plan Topics (1/2)

(Example ideas for discussion shown for illustrative purposes only)

Market Change Topic	Future Market Topics	By When	Topics
COMPRESSORS Assessment of options to deliver changes to the way we use our compressors to: 1) ensure we meet the requirements of the Industrial Emissions Directive (IED) 2) provide future operational flexibility 3) enable effective decommissioning	2) Future Networks & Markets 8) Whole Energy System	By 2023	Legislation GDF - capability to manage the system effectively
NETWORK INVESTMENT AND PLANNING Underpinning the flexibility needed to maintain network capability, including how we do potentially re-use decommissioned parts of the NTS if flow patterns change in future. This could include CO2, hydrogen or other new technologies	4) Decarbonisation of heat 2) Future Networks & Markets 8) Whole Energy System	2023-2023	
SAFETY INFORMATION Deliver opportunities to provide new or additional safety information at entry points, exit points, compressor stations or jointly	2) Future Networks & Markets	2023-2029	Customer signals
ENTRY CAPACITY Ensure that the entry capacity arrangements are able to optimise existing capacity and include this could include modified concepts such as zone or point to point arrangements, new non-CAD production or moving towards a flat fee structure, distance related fee, charging scheme etc.	2) Future Networks & Markets	By 2024	Market and regulatory signals
CAPACITY BASELINES Ensure that entry capacity baselines arrangements are fit for purpose and do not create inefficient investment costs. This could include a review to ensure that the arrangements are compatible with new arrangements such as hydrogen production	2) Future Networks & Markets	2023-2024	Market and regulatory signals
CHARGING Continue to review the gas charging framework to ensure that it allows the market to function and is suitable for how the network is expected to be used. This may include a review of the SUT/SC or charging based solely on entry or exit capacity, review of commodity charges etc.	2) Future Networks & Markets	2023-2023	Open impact assessment and research on current charging review NGB commission
FUTURE OF GEMINI Review the requirements of a future Gemini system and deliver new products and services fit for the future of the gas market, including innovative solutions.	2) Future Networks & Markets	2023-2024	Technology shifts R&D
SIMPLIFICATION OF MARKET FRAMEWORKS Seek to simplify the market arrangements to be as not a barrier to entry, and charge can be introduced in an agile way	4) Decarbonisation of heat 2) Future Networks & Markets	2023-2029	Customer feedback
EU REGULATORY CHANGE New gas package - the EC is currently studying the gas market in balance of potential new gas market rules which will come into force from 2025	4) Decarbonisation of heat 2) Future Networks & Markets 8) Whole Energy System	2023-2023	New EU regulations

- The *Gas Industry Change Plan* seeks to take the next step in our future of gas programme, by establishing a long term, stakeholder backed programme of strategic change
- The *Gas Industry Change Plan* is about more than just regulatory change. It could be driven by a number of future developments such as UNC or licence
- The plan is not a firm view of our work programme. It will include triggers and interdependencies and is designed to facilitate an open discussion about the future.

Questions for discussion

1. Do you agree with the concept of the change plan?

2. Do you have any initial feedback on the illustrative content of the plan?

3. How should it be managed & changed? How would you like to feed in?



The background features a grid of squares in various shades of blue, including light blue, medium blue, and dark blue. The squares are arranged in a pattern that is partially obscured by the text.

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Voting

Our impact on you

- *On a scale of 1 to 5, where 1 is not impacted at all and 5 is impacted a great deal, how impacted are you (or those you represent) by what we've just spoken about?*
 1. Not impacted at all
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Who we are and what we do

- Jenny Phillips

National Grid Gas Transmission – the network

**Our
role**

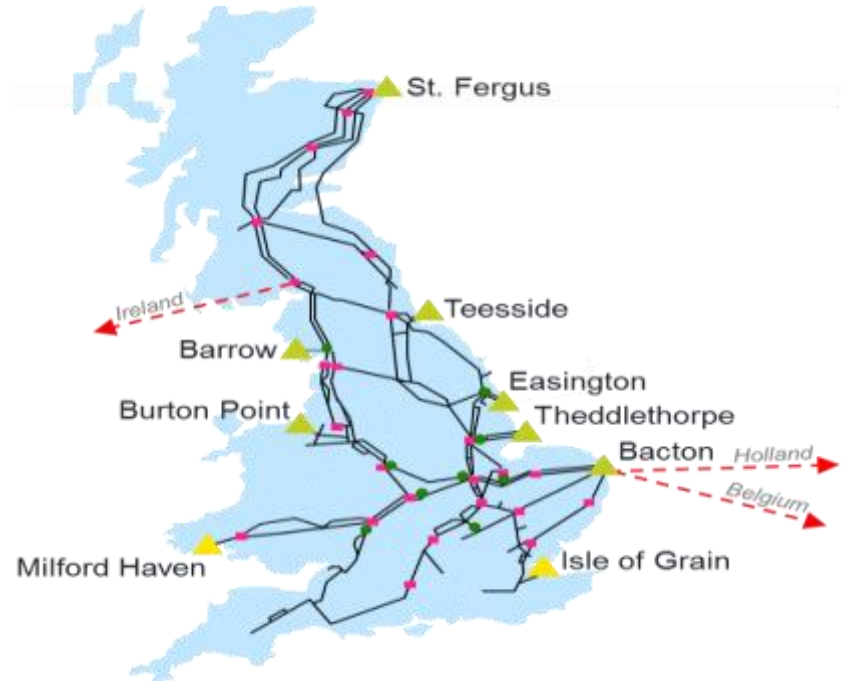
To connect millions of people to the energy they use safely, reliably and efficiently

**We
own &
operate**

7,660km of high pressure pipelines, 24 compressor stations and over 600 above ground installations

**We
transport**

Over 3 times the energy provided by electricity each year



Gas Distribution



Distribution

- Four Distribution Network Companies (DNs)
- Operating Pressures 38bar to 22mbar
- Passive Networks
- DN transports gas to domestic users, commercial properties and medium sized businesses
- Most gas through the DN is for homes and small businesses
- A smaller proportion is for larger sites such as Power Stations and Large Industrial and Commercial Users

National Grid Gas Transmission - TO/SO

Transmission Owner (TO)

Builds, maintains and owns assets



System Operator (SO)

Real-time operation of the network

Why we treat gas with respect



How the Network use has evolved over time

Gas flow

2000

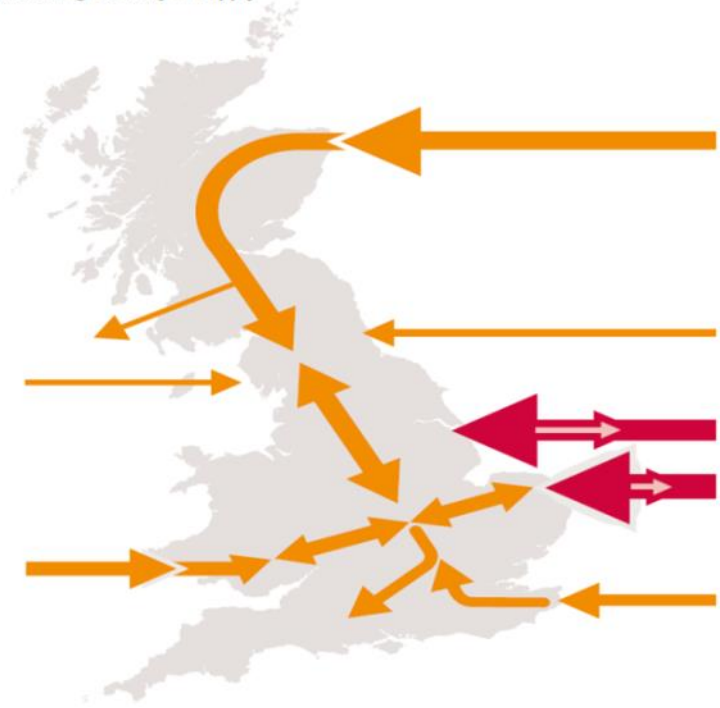
Predominant North to South



Gas flow

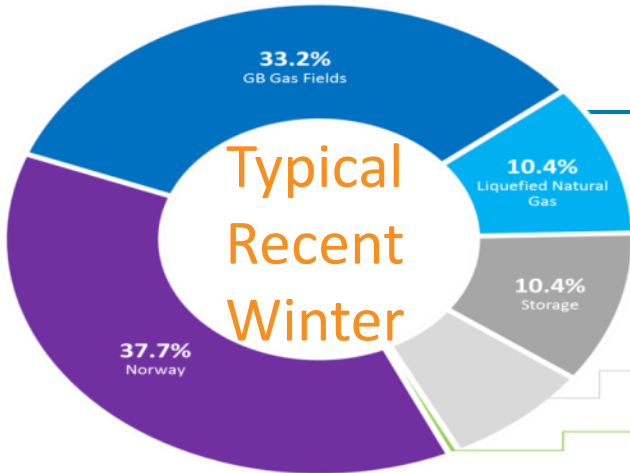
2014 onwards

Increasing diversity of supply



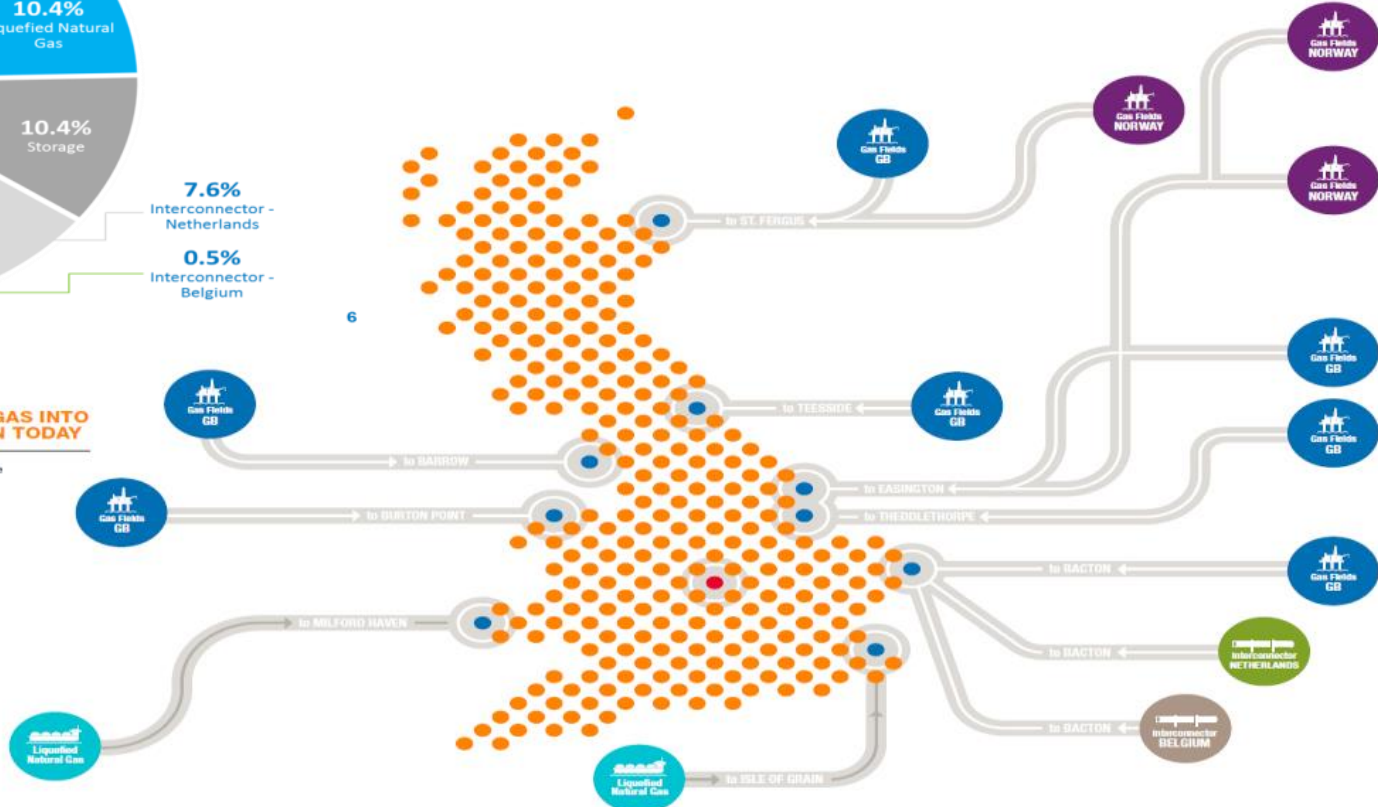
Supply Sources

Typical
Recent
Winter



SOURCES OF GAS INTO GREAT BRITAIN TODAY

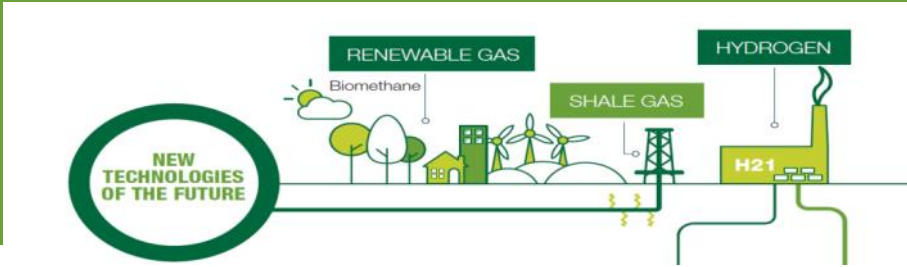
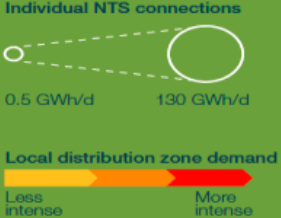
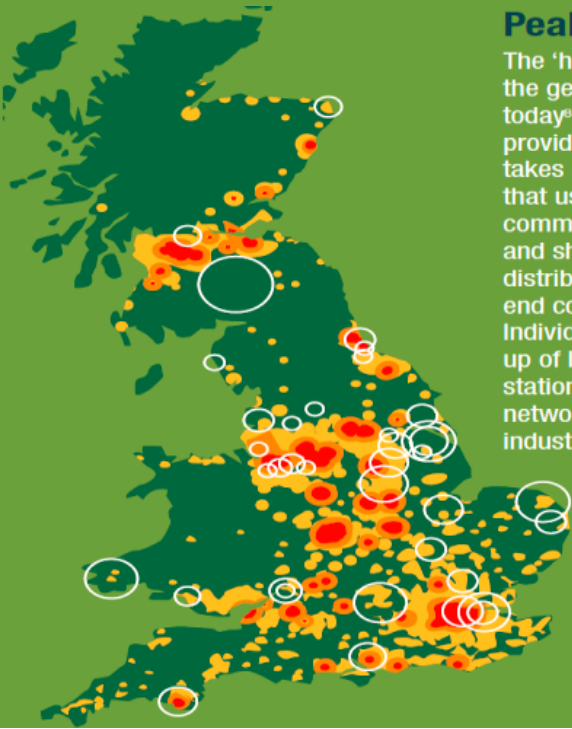
● Gas National Control Centre



Demand Distribution

Peak day gas demand

The 'heat map' on the left illustrates the geographical demand for gas in GB today. It shows where the gas networks provide gas across the country. This takes into account all the sectors that use gas: domestic, industrial, commercial and electricity generation, and shows how the transmission and distribution systems are used to meet end consumer demands all over GB. Individual NTS connections are made up of large industrial sites and power stations, and the local distribution networks demand include commercial, industrial and domestic.



Balancing: Meeting customer requirements

Responsibility

Safe, efficient and economic transport of gas to meet customer requirements.

Unconstrained

The ability for customers to put gas in to and take gas out, where & when they want and in the quantities they want.

Challenge

Providing a level playing field and where possible an unconstrained service to our customers. Facilitating an efficient market, whilst maintaining gas quality and pressure requirements.

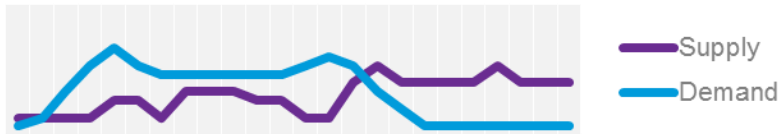
Operating the National Gas Transmission System

- Jenny Phillips

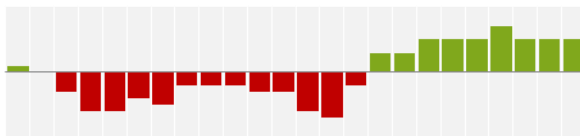
Operating the National Transmission System...

The NTS transports gas from entry point (supply) to exit points (demand).

The daily profiles of supply and demand can differ significantly.



The volume of gas in the NTS varies during the day.

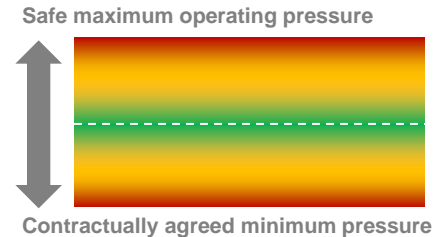


Typical
daily
balance

The volume of gas in the NTS at any one time is referred to as “Linepack”.

System pressure is directly related to linepack.

The NTS is able to operate within a range of pressure limits.

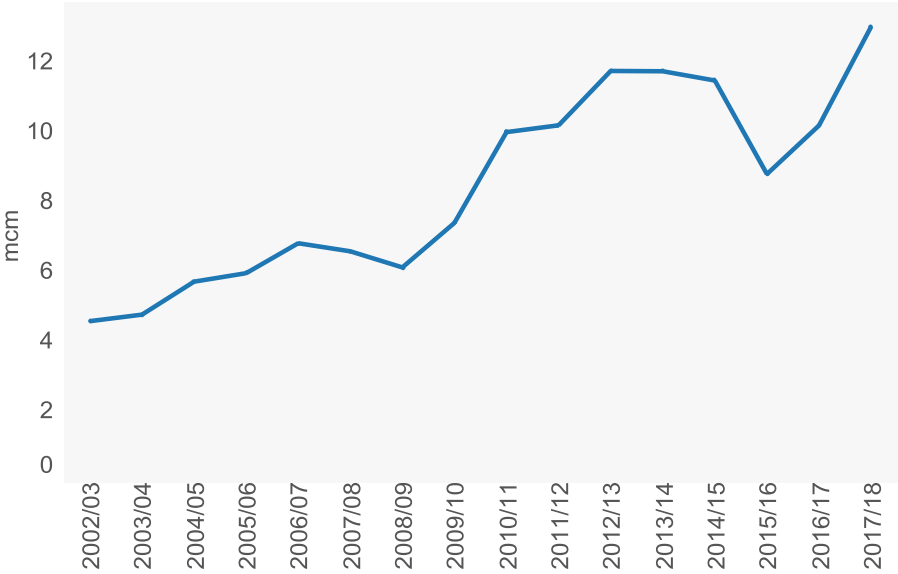


This allows for some flexibility to manage the daily imbalances and protect customers from short-term asset failures.

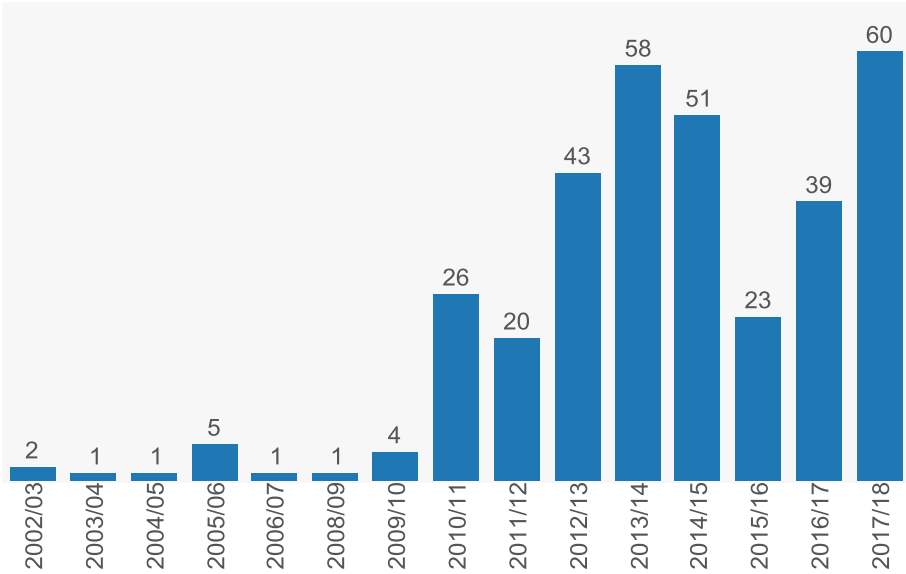
Note that the NTS was built to transport gas efficiently based on flat daily supply and demand profiles.

Reliance on linepack flexibility has increased

Average daily linepack swing

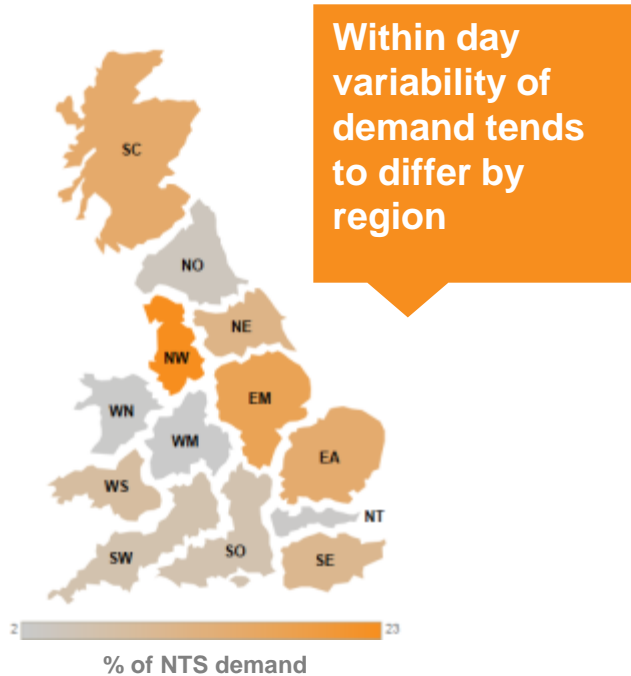


Number of days with a large linepack range (Greater than 20 mcm)



Varying within day supply & demand

Within the day demand and supply will vary regionally.

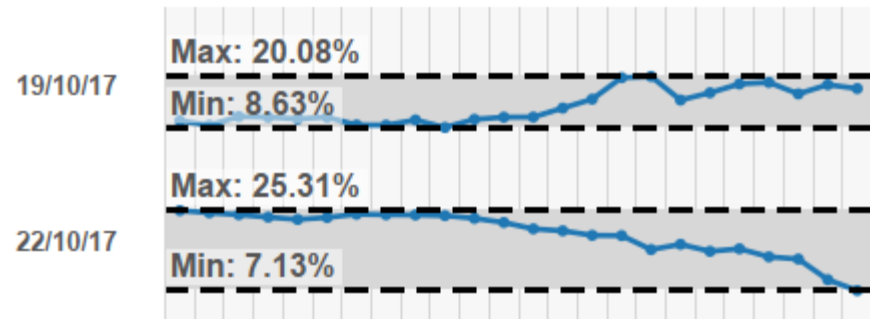


Aggregate demand levels have been reducing;

However demand profiles more volatile within day.

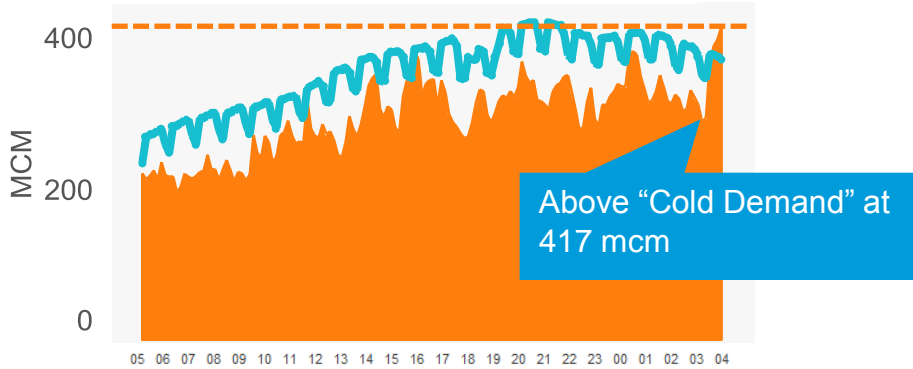
Example: North West demand percentage and profile variation

NW Demand as % of NTS Demand

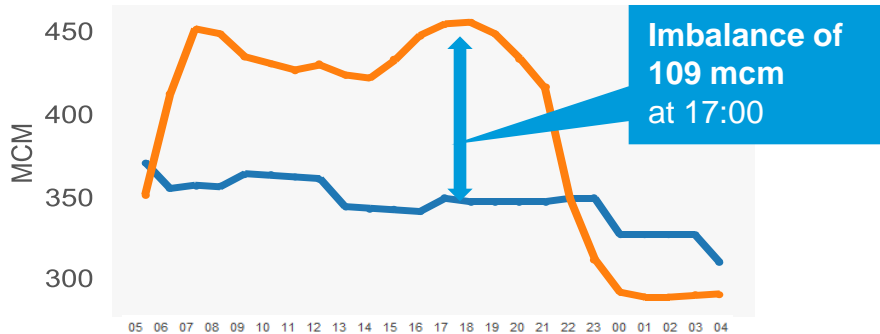


Example Day : 1st March Gas Deficit Warning Issue at 05:47

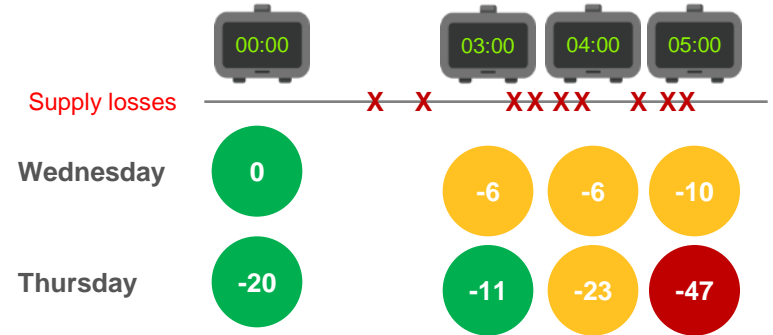
- 1. Unseasonably high Demand against significant cold front leading into the day



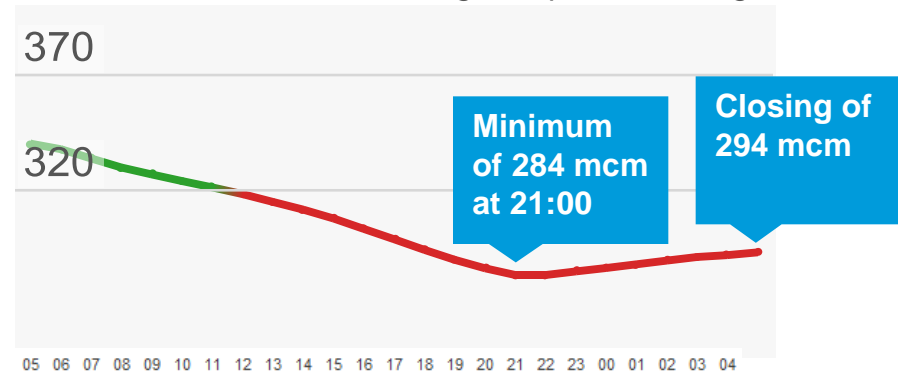
- 3. Projected large and sustained imbalance at 05:00 between Demand and Supply during the 1st March



- 2. Multiple supply losses during the evening of the 28th between 01:00 and 05:00 leading to a significant shortfall

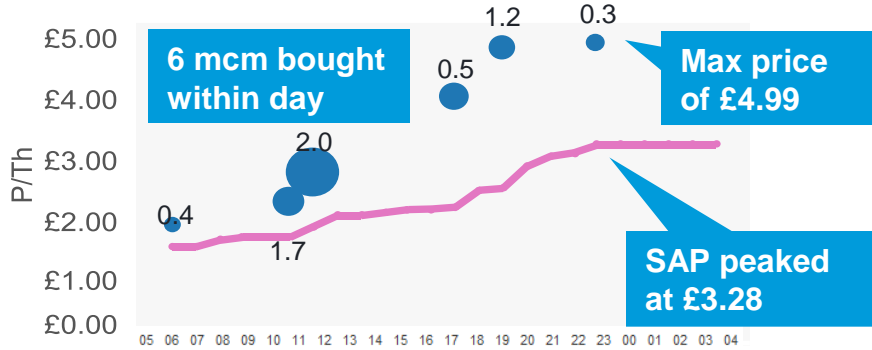


- 4. The resultant 05:00 projection for NTS Stock Level depletion meant that the NTS would fail against pressure obligations.

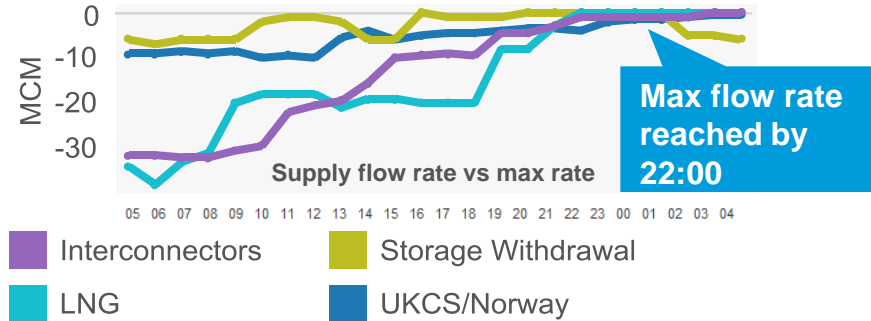


Example Day : 1st March National Grid Actions & Impact

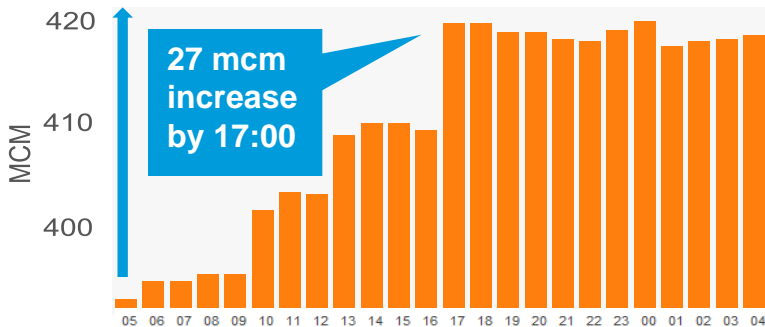
1. Consistent (Volume / Price) OCM trading throughout day accepting available offers.



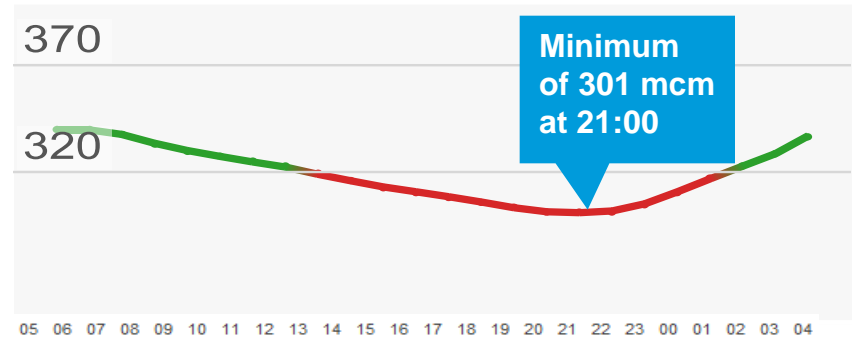
2. Only significant available supply response available via LNG (SH & Grain) and Interconnectors.



3. Major upward revision of end-of-day demand forecasts by distribution networks – no DSR evident



4. Lowest ever recorded linepack. OM required within-day to support extremity. Two assured DN pressures missed.



Example Day : 1st March National Grid Actions & Impact



Impact on Field based staff



Key Actions

24/7 manning of key sites

Technicians staying in local hotels

Clearing of ice and snow from compressor air intake filters (pic) using harnesses and brushes.

Prioritising staff attendance at more critical sites

Utilising specialist expertise to plan for emergency running of alternate compressors units

Farmers assisting with site access utilising farm machinery.



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Break



Our Performance - Bridget Hartley

Current performance against outputs

Regulatory Performance Measures 2016/17	
<p>Safety</p>	 <p>No-one was injured as a result of our activities and we met all of our safety targets</p>
<p>Reliability</p>	 <p>In general we operated and maintained the NTS to deliver the reliability that gas consumers and our stakeholders expect. There were a few days in the year where we couldn't provide the capacity that some of our stakeholders required.</p>
<p>Environment</p>	 <p>Our work to modify our assets to reduce our impact on the environment was delivered to target. Additional compressor operation to meet challenging network conditions meant that we exceeded our emissions targets</p>
<p>Customer / Stakeholder</p>	 <p>We have been able to meet our customer connection requests and we have received good feedback from our customers and stakeholders</p>

What you've told us...during the listen phase

Cyber Security?

Network review has delivered but needing long term plan to meet 2030 compliance

Interaction between networks not captured

'so what' test, what do outputs mean for consumers and society etc?

Air quality as an output rather than solely carbon emissions

No future of gas/ decarbonisation outputs

Reporting framework Proactive if issues identified Link issues together

Need to evolve framework is in place to deal with and support distributed gas

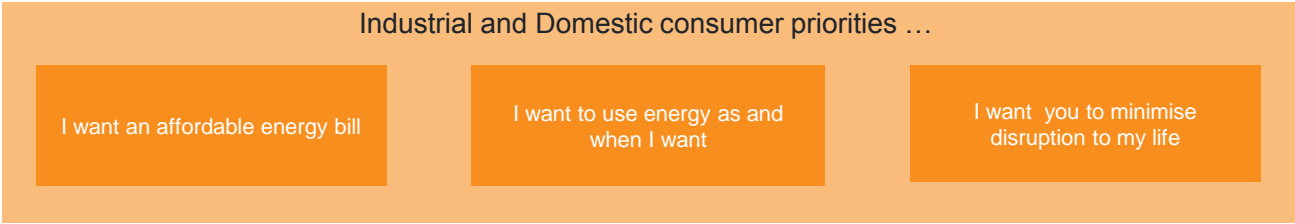
true cost of linepack, NTS vs DN cost

More 'outcome' focus needed, these are 'inputs', how is value for money demonstrated

One of the key aims of the RIIO price control framework is to support that transition. However, Sustainability First has found the fragmented nature of the current incentives in RIIO1 does not provide a coherent or necessarily strong signal to the networks on carbon reduction.

Do output measures sufficiently capture outputs that directly relate to delivering goal of wider energy policy?

Gas Stakeholder Engagement Priorities

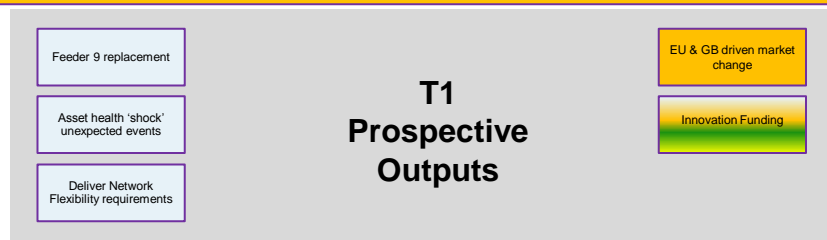
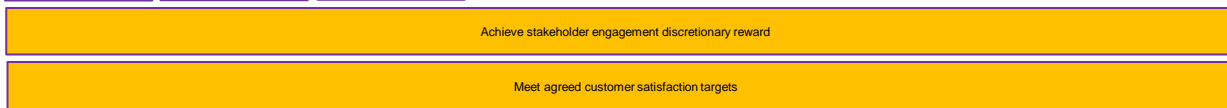
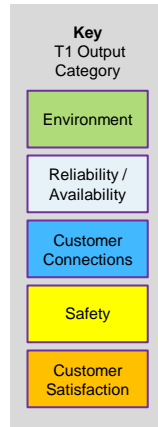
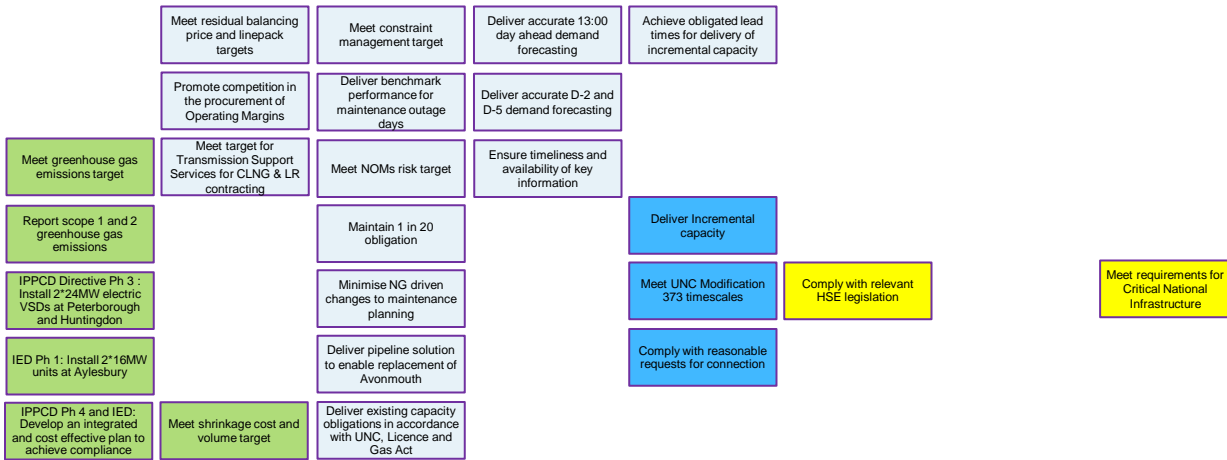
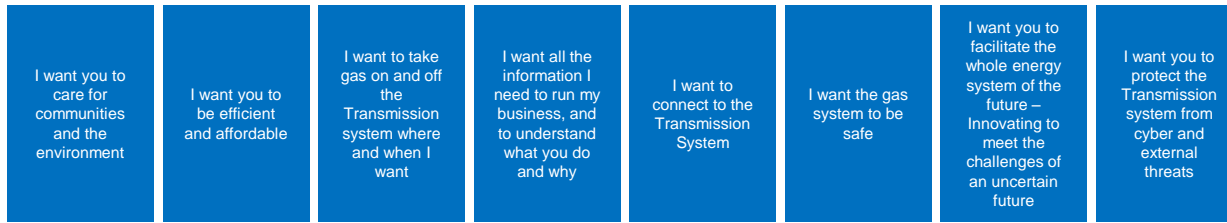


...are delivered through our stakeholder priorities...



...these were developed by consulting with





Question for discussion

1. Should we have measures against each stakeholder priority?

2. What would you like us to deliver for you under each priority?





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Voting

Our impact on you

- *On a scale of 1 to 5, where 1 is not impacted at all and 5 is impacted a great deal, how impacted are you (or those you represent) by what we've just spoken about?*
 1. Not impacted at all
 - 2.
 - 3.
 - 4.
 5. Impacted a great deal

Question 1

Q: Should our outcomes/performance measures be aligned to our stakeholder priorities?

1. No

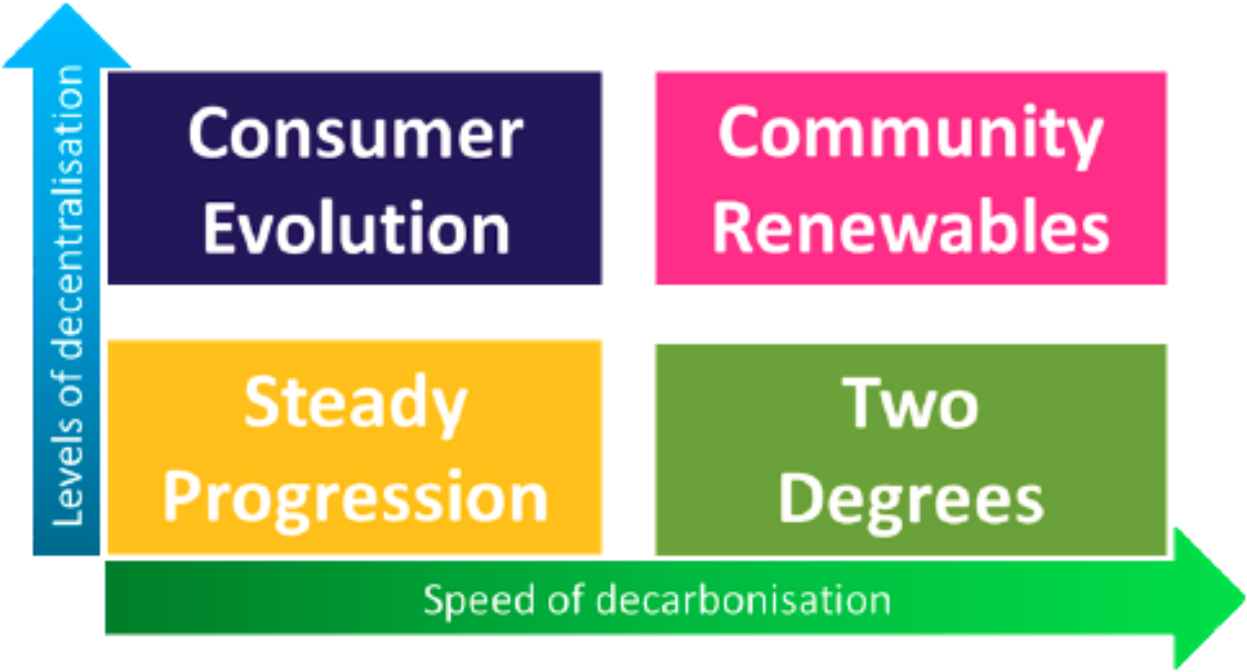
2. In some cases

3. Yes

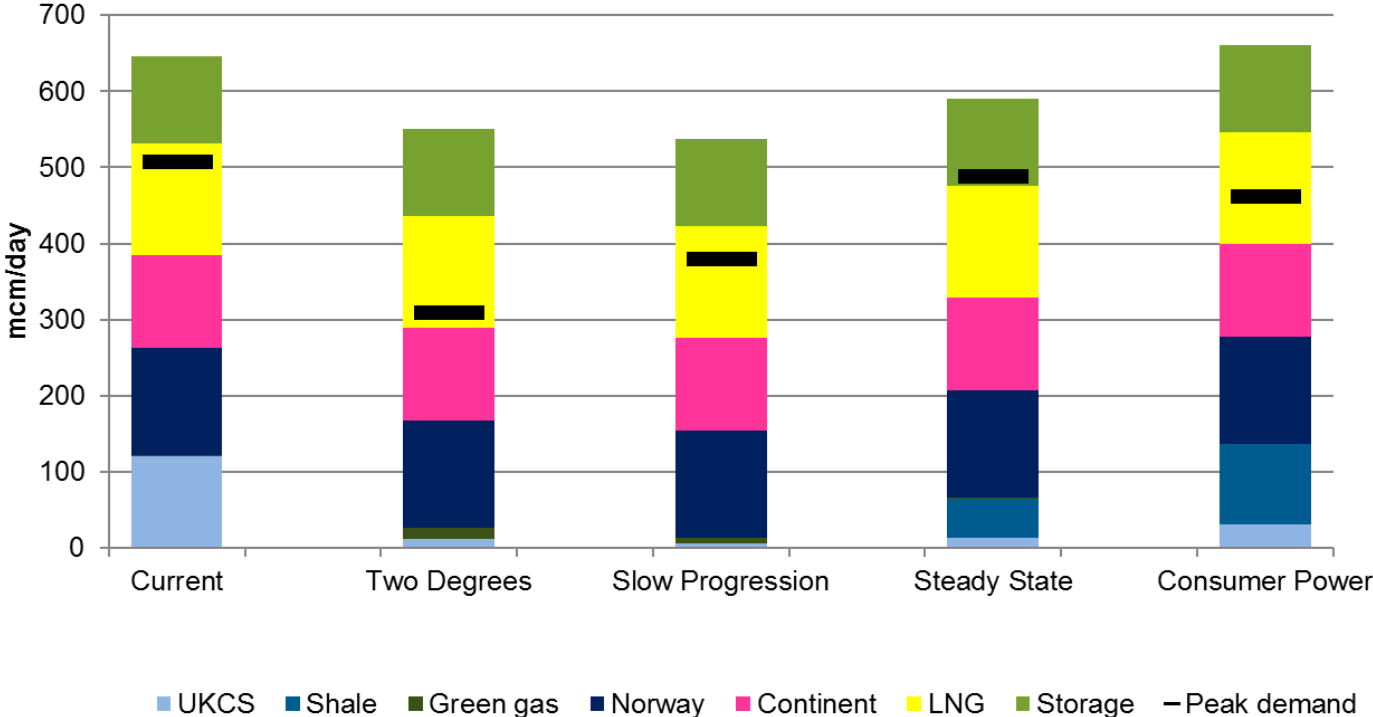
Scenarios – Our planning assumptions

- Jenny Phillips

FES helps us explore a range of credible futures and to better understand what is common and the uncertainties facing the industry



Range of potential supply mix in 2040



Source: FES17: Peak gas supply summary in 2040

Similar chart for demand is in the FoG slide

Our Approach

- FES shows a wide range of energy futures and a wide range of gas supply & demand patterns
- Looking to develop plans for the transmission network that will deliver against these scenarios
 - Mitigate risk to consumers
 - Mitigate risk to security of supply
- Use industry change plan to identify triggers to help us understand direction of travel and hence regularly review our plans

Question for discussion

1. What are your thoughts on our approach to using Future Energy Scenarios?





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Voting

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 1. Not impacted at all
 - 2.
 - 3.
 - 4.
 5. Impacted a great deal

Question 2

Q: Do you support our approach to using Future Energy Scenarios?

1. No

2. Unsure

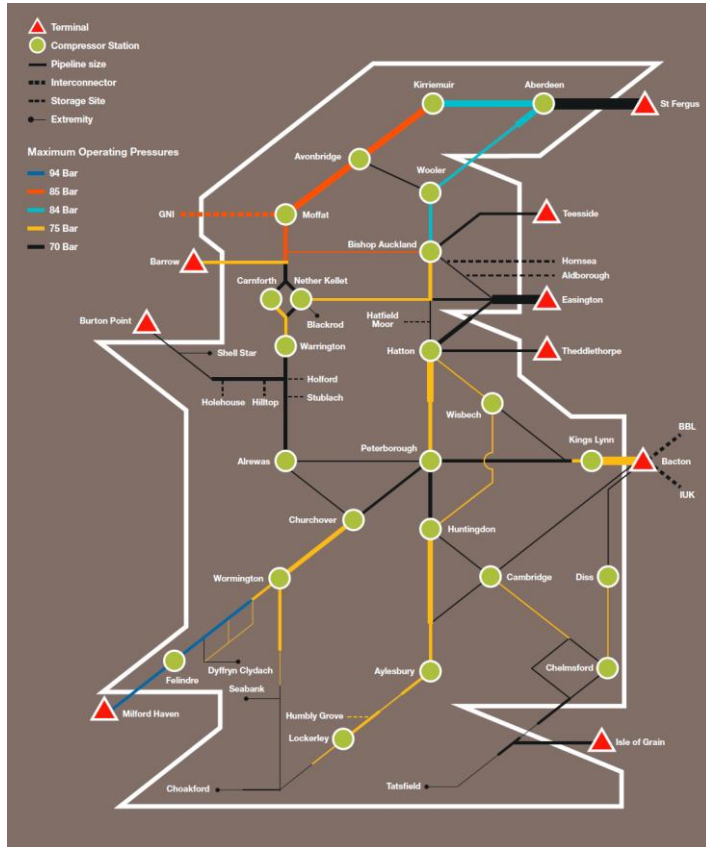
3. Yes



I want to move gas on and off
the National Gas
Transmission System, where
and when I want
- Jenny Phillips



Simplified map of NTS



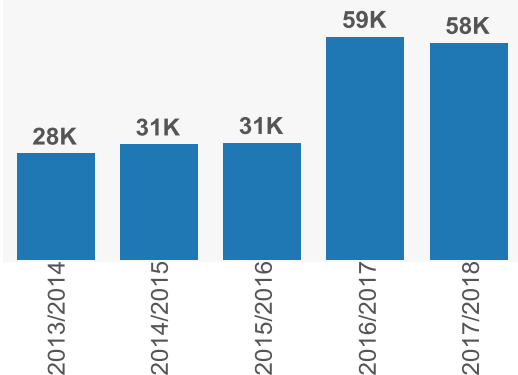
Moving gas around the NTS

We are reliant on using compression to move gas from the entry points to where it's needed.

87% Increase in compressor running hours vs 2015/16

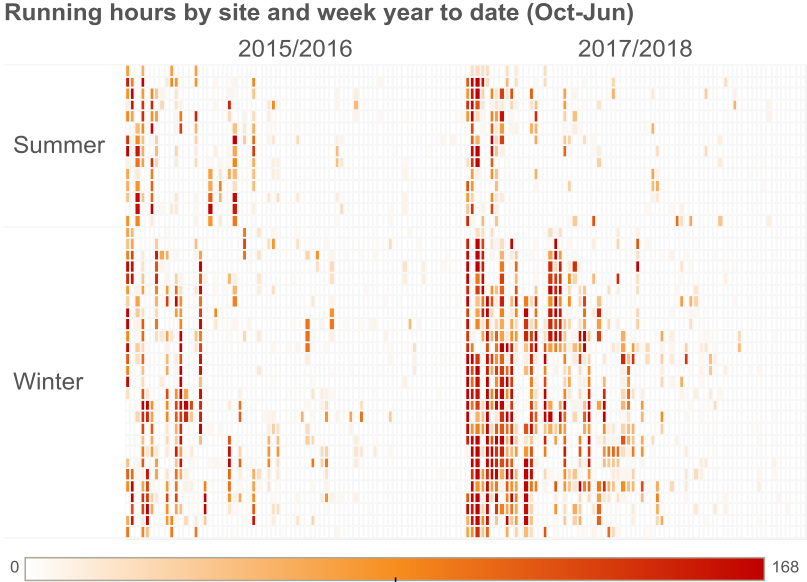
- Balance
- Uncertainty
- Reliability

Running hours by gas year to date (Oct-Jun)



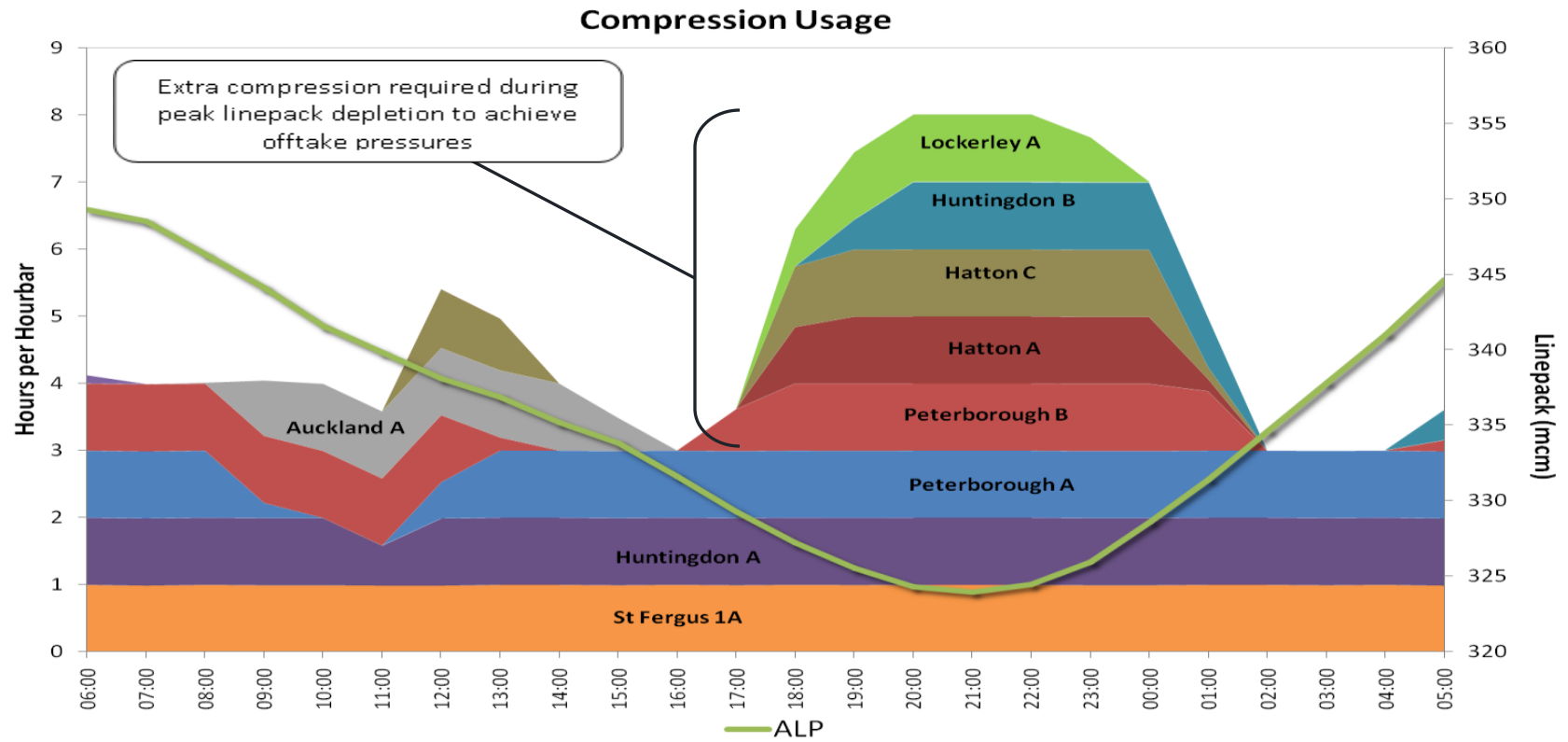
There is an environmental impact from running compressors

It is becoming increasingly challenging to plan and manage our outage requirements without causing customer disruption.

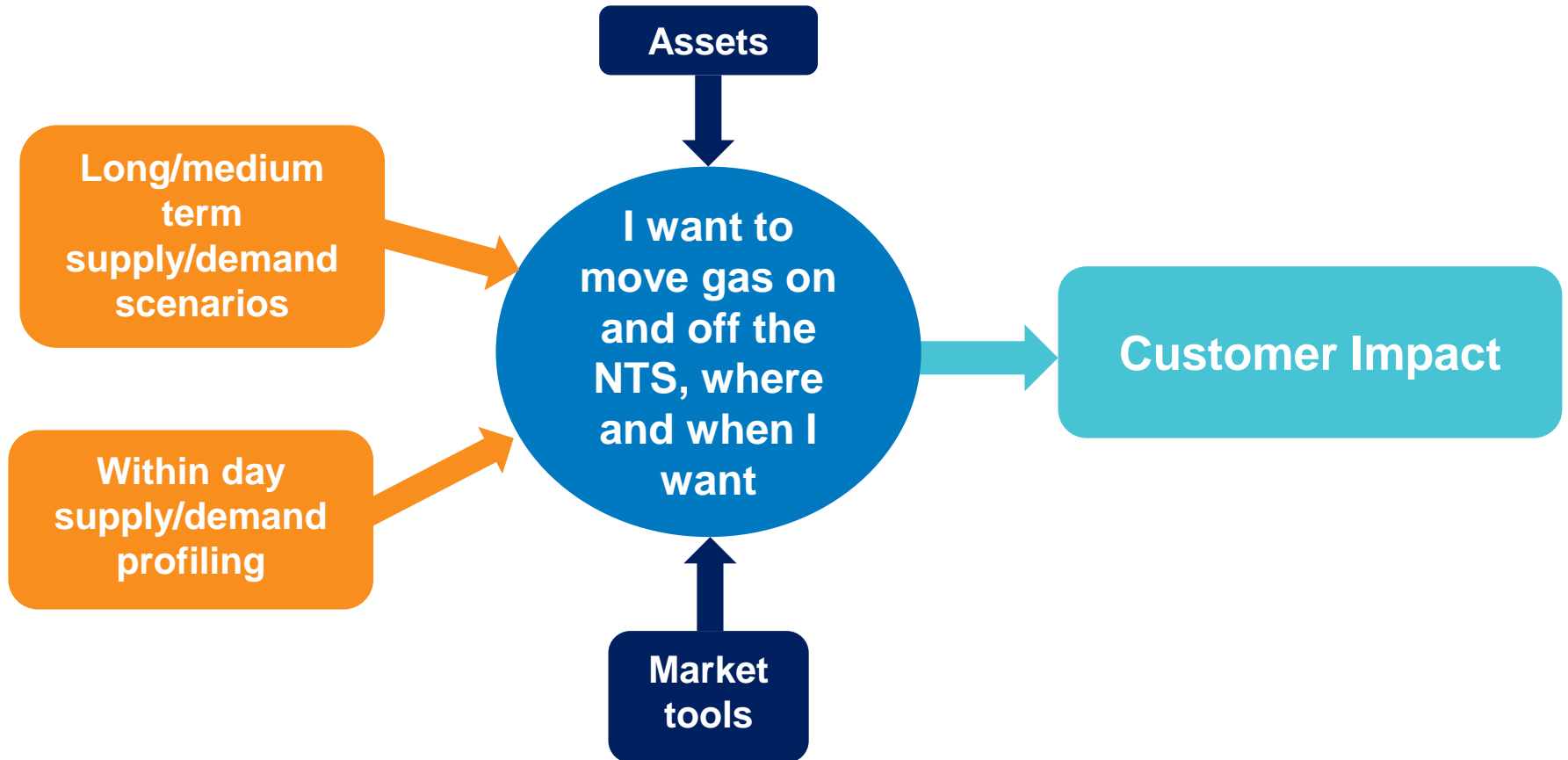


Swing Impact: Additional Compression

25th March 2014



Summary



Question for discussion

If you can't put your gas on or take it off when and where you want, what processes are impacted?



Question for discussion

What are the different impacts?

Under current market conditions... What level of disruption would be acceptable to your business?



Question for discussion

Out of all the services we provide, which aspects could we improve to make your processes more efficient or deliver more value to your business?



Maintenance / Supply interactions

National Grid has to maintain its assets

This has the potential to cause disruption to entry and exit flows

While we aim to minimise impact, there are certain sites where impact is inevitable

There are some site specific investments that could avoid impact



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Voting

Our impact on you

- *On a scale of 1 to 5, where 1 is not impacted at all and 5 is impacted a great deal, how impacted are you (or those you represent) by what we've just spoken about?*
 1. Not impacted at all
 - 2.
 - 3.
 - 4.
 5. Impacted a great deal

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Lunch



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Welcome Back!



Quick Poll

- How alert are you?
 - 5: I could go for a run
 - 4
 - 3
 - 2
 - 1: I could do with a lie down

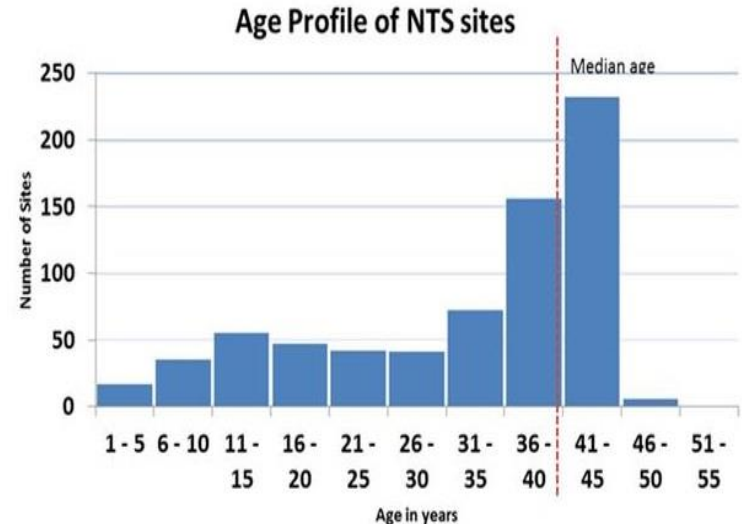
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Asset Management - Bridget Hartley

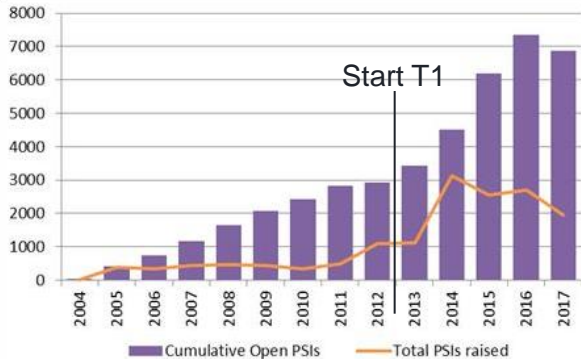
Managing Asset Health of the Gas Transmission System nationalgrid

- Assets need the right interventions to:
 - Deliver the capability our consumers' and customers' need
 - Maintain safe operation
- Key focus areas to date:
 - Strengthening asset information to enable our asset management decisions
 - Efficient delivery of asset interventions, through project and contract management
 - Asset groupings are driven by the types of works, sites and contract strategy and our campaign approach.



Asset condition

As we have undertaken asset health works, we now have an improved understanding of asset condition



Number of asset issues has increased significantly since the start of RIIO-T1



Consequence of failure?

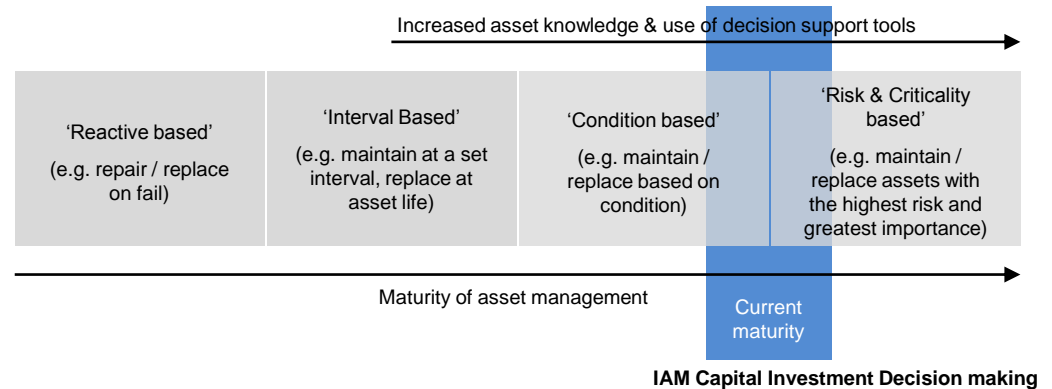
Failure to deliver output commitments:

- Safety
- Reliability
- Environmental
- Customer/Stakeholder

Asset health strategy

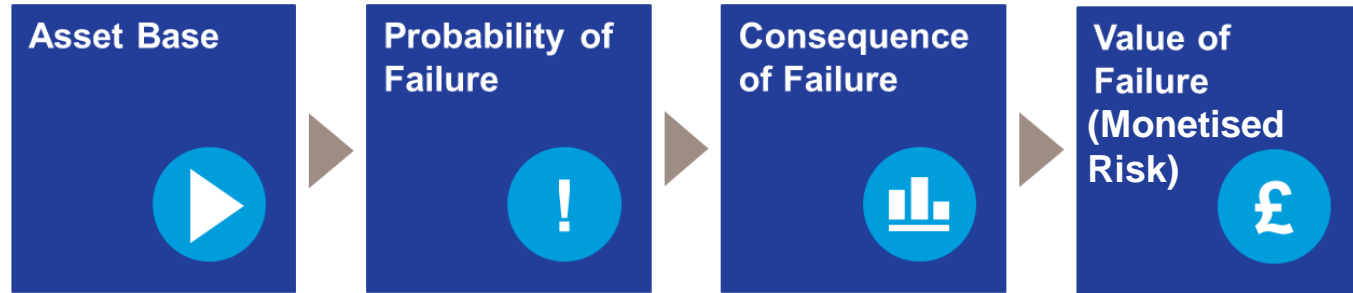
– How we decide what work to do

- Our plans are driven by:
 - Legislative requirements
 - Condition based assessment (focusing on critical assets, e.g. COMAH sites)
 - Interval based repairs and maintenance, i.e. compressor overhauls.



- Our use of Plant Status reports allows us to assess where our health spend should be targeted by assessing risk in terms of safety and reliability.
- Increase in network complexity brings in other assessments, such as compressors where there is a need to meet asset health requirements, supply and demand scenarios and environmental legislation through BAT assessments.

Development of new Methodology



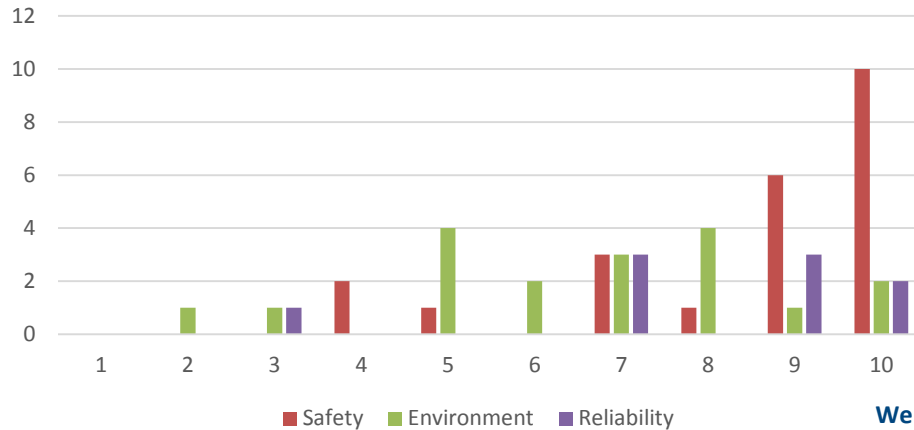
- New approach developed and shared with Ofgem aligned to other energy utilities
- Currently in Validation, Testing and Calibration of model
- Industry consultation complete
- Implementation dependent on our data collection which will be complete in September 18

Cross Sector RIIO-T1 rebasing

- Working with Ofgem in how to translate existing RIIO-T1 targets into monetised risk
- Options being considered shared with Ofgem

Stakeholder Engagement Feedback

Stakeholder views from Listen phase
10 = high value to output, 1 = low value



We should offer a range of investment scenarios based around different timescales for examining the benefit of investment. A 25 year timeframe is likely to be the optimum period

We should show the costs to achieve the risk reduction, particularly where there are options about the level of service provided

We should make investments so that we continue to operate a safe system that manages the risk to people who work with us or may be harmed by incidents on our network

National Grid should continue to invest efficiently at a level that ensures compliance with environmental legislation but not to reduce its impact on the environment

We should place greatest value in our investment planning against ensuring that we maintain the reliability of the gas supply to consumers and connected stakeholders

Application of new methodology

- This uses advanced modelling software enabling us to model almost infinite options

Category	Service Risk Measure
Safety	Health and Safety of the General Public and Employees
	Compliance with Health and Safety Legislation
Environment	Environmental Incidents
	Compliance with Environmental Legislation and Permits
	Volume of Emissions
	Noise Pollution
Availability and Reliability	Impact on Network Constraints
	Compensation for Failure to Supply
Financial	Shrinkage
	Impact on Operating Costs
Societal and Company	Property Damage
	Transport Disruption
	Reputation

Discussion question – Which additional options would you like us to?

These options will be costed

Option 1:
Keep costs the same
for consumers as T1

Option 2:
Keep risk the same

Option 3:
Lowest whole
lifecycle cost

Option 4:
10% increase in
safety risk

Option 5:
10% reduction in
safety risk

Option 6:
10% increase in
environmental risk

Option 7:
10% reduction in
environmental risk

Option 8:
10% increase in
availability/reliability
risk

Option 9:
10% reduction in
availability/reliability
risk

Discussion question –

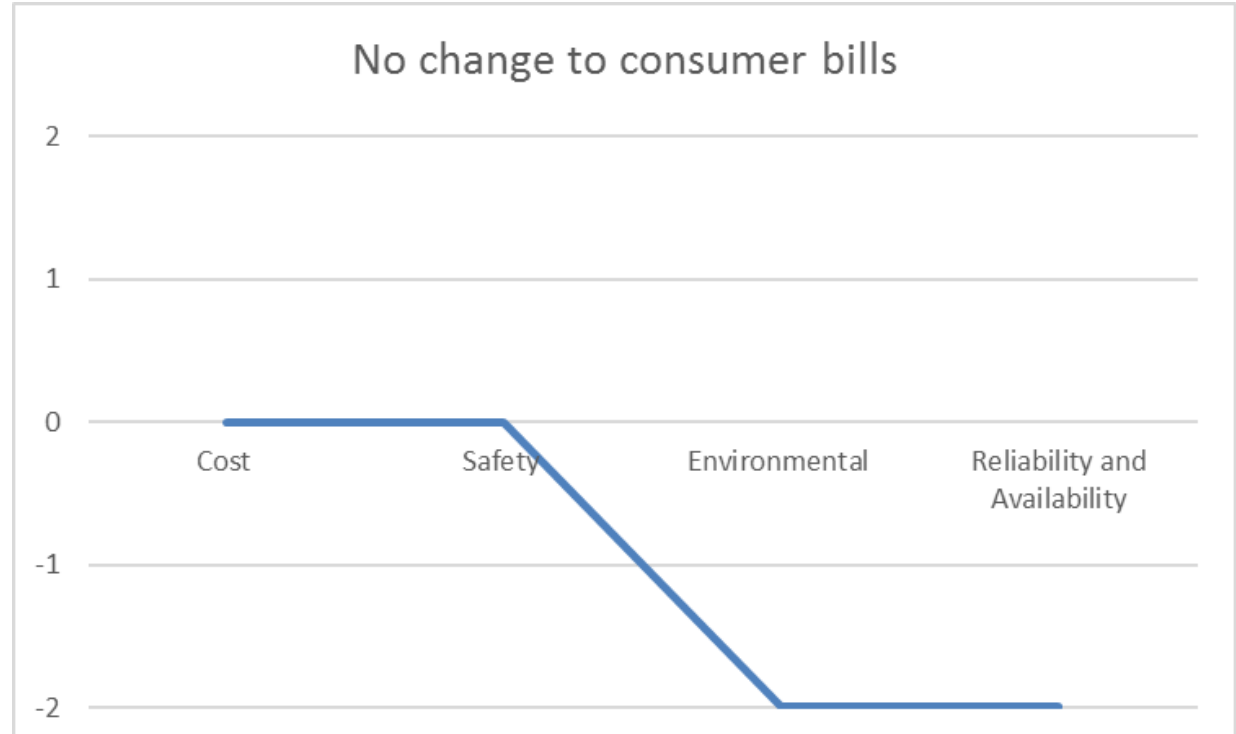
Which options would you like us to develop in to costed options?

**Option 1:
Keep costs the same
for consumers as T1**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

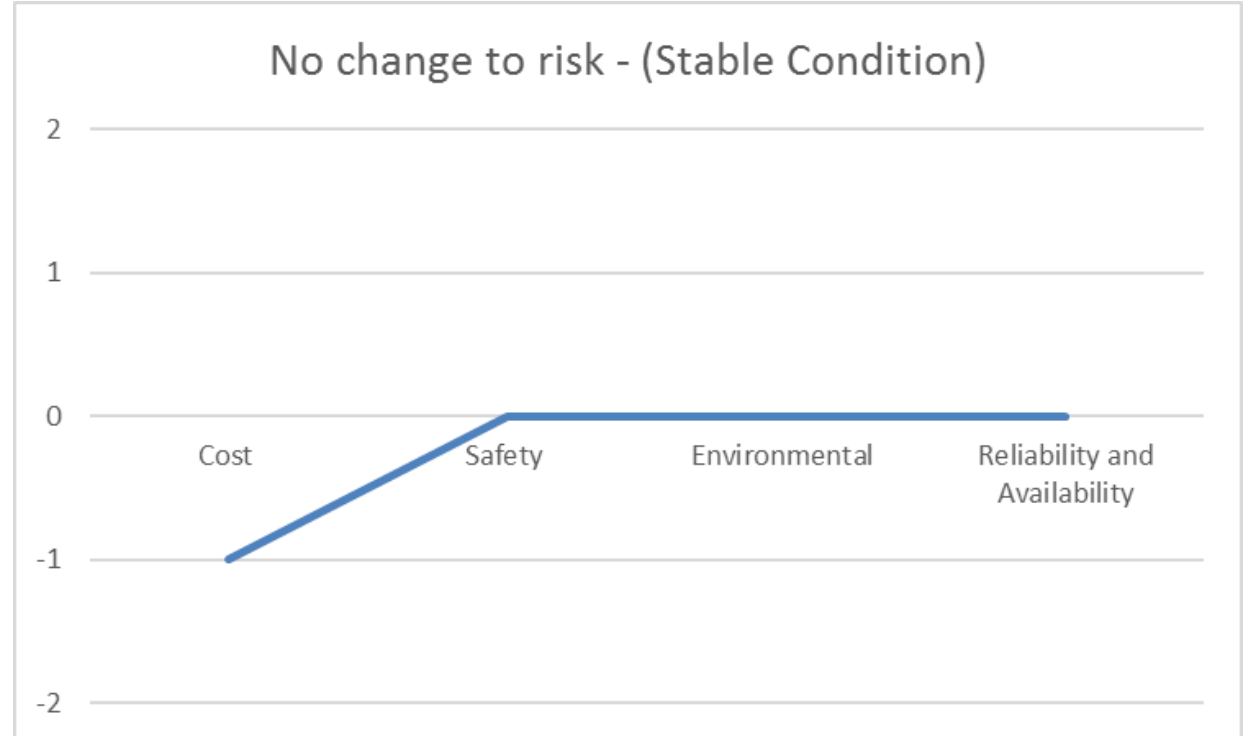
Which options would you like us to develop in to costed options?

**Option 2:
Keep risk the same**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

Which options would you like us to develop in to costed options?

**Option 3:
Lowest whole
lifecycle cost**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

Which options would you like us to develop in to costed options?

**Option 4:
10% increase in
safety risk**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

Which options would you like us to develop in to costed options?

**Option 5:
10% reduction in
safety risk**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

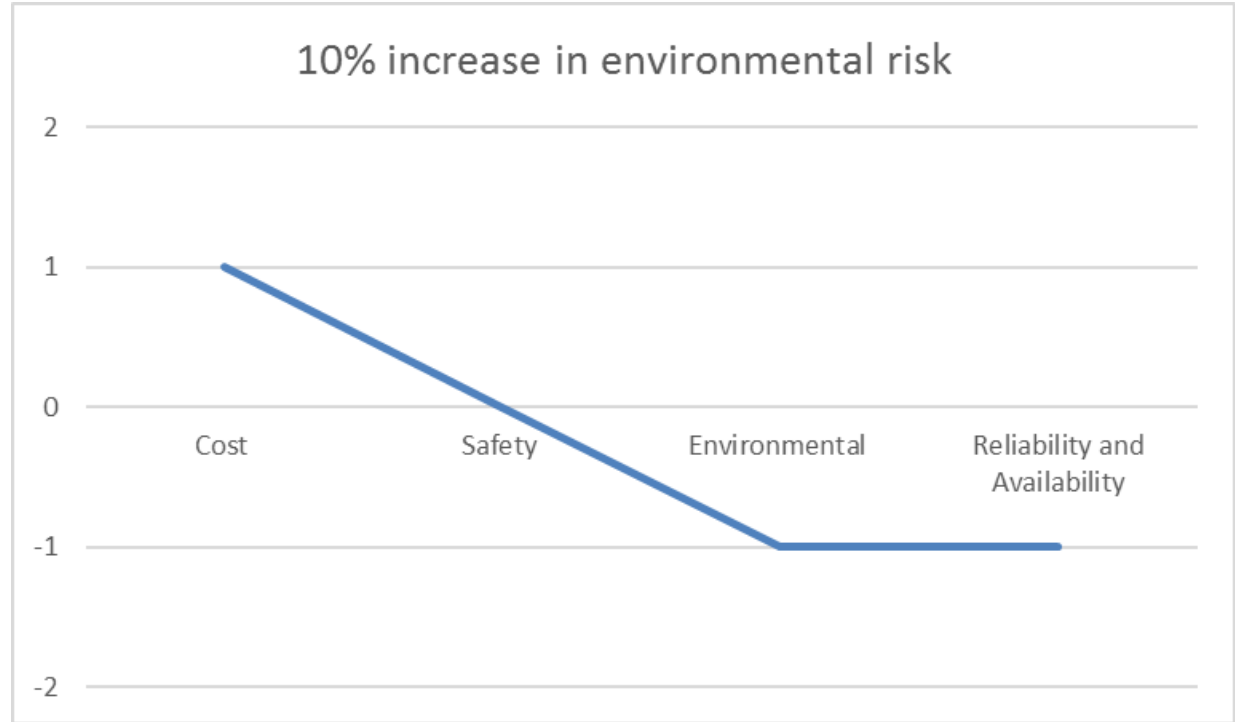
Which options would you like us to develop in to costed options?

**Option 6:
10% increase in
environmental risk**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

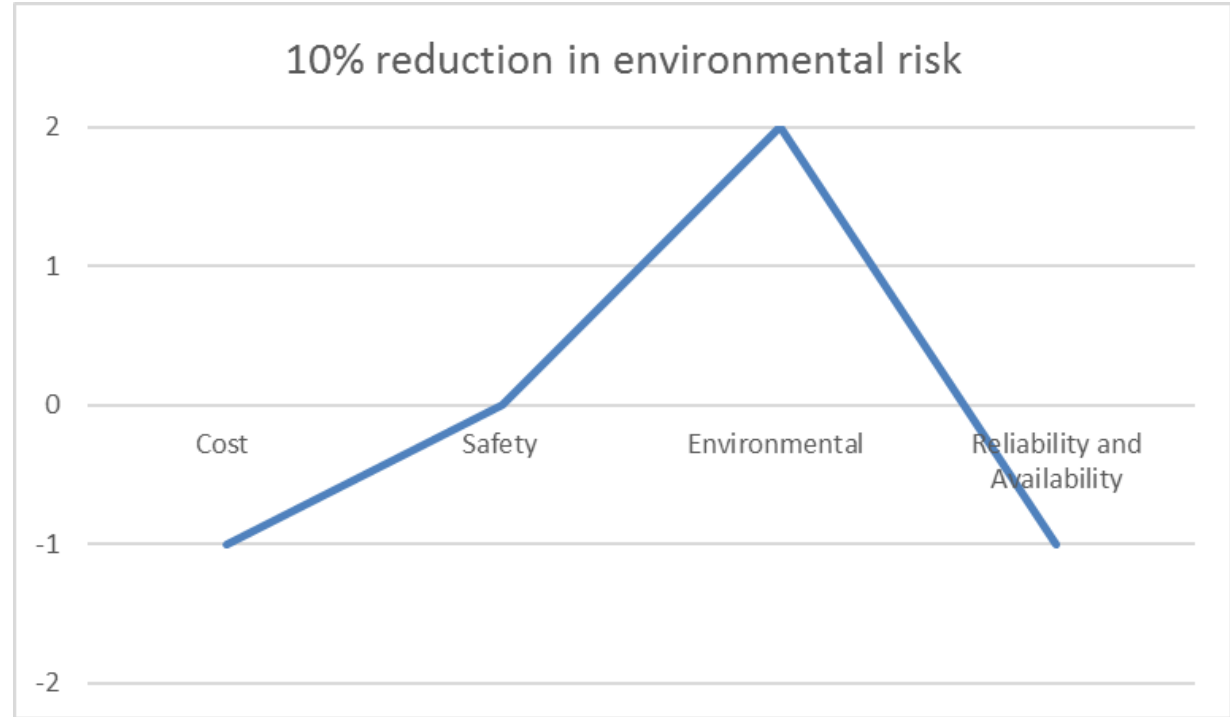
Which options would you like us to develop in to costed options?

**Option 7:
10% reduction in
environmental risk**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Discussion question –

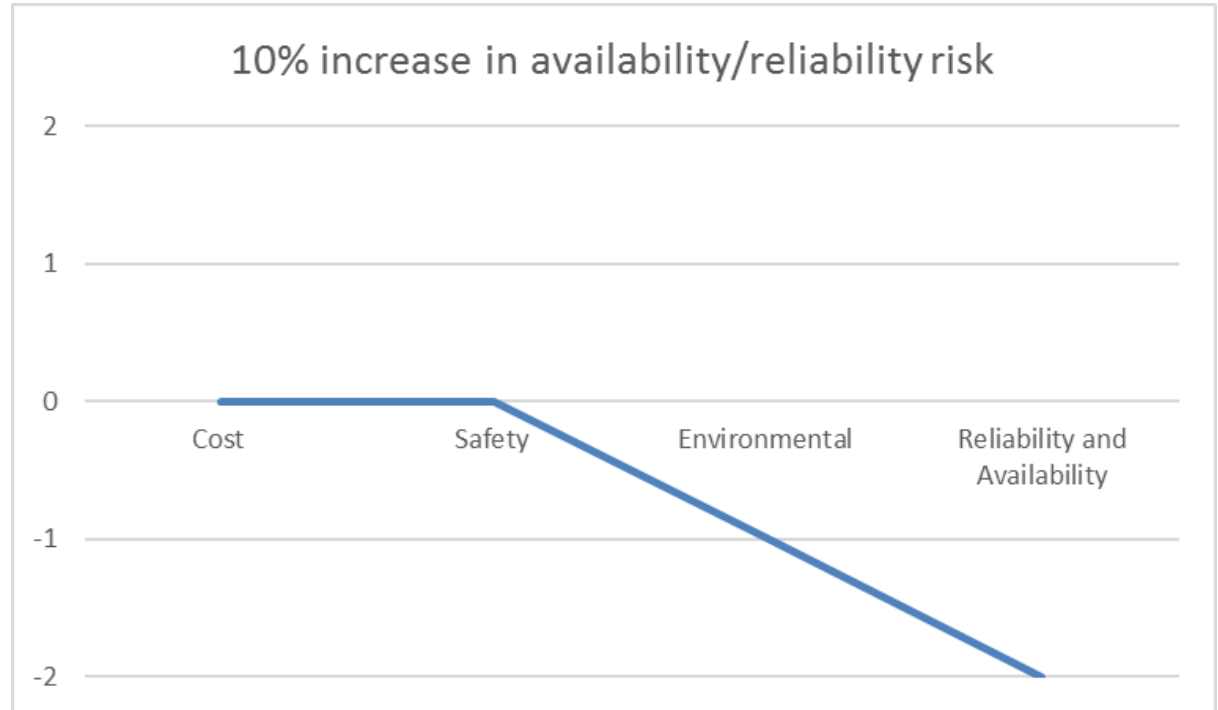
Which options would you like us to develop in to costed options?

**Option 8:
10% increase in
availability/reliability
risk**

**Y Axis show Risk
Performance Impact**

An Example:
Positive Cost Impact =
Reduced Costs

Negative Risk Impact =
Increased risks across
the network



Discussion question –

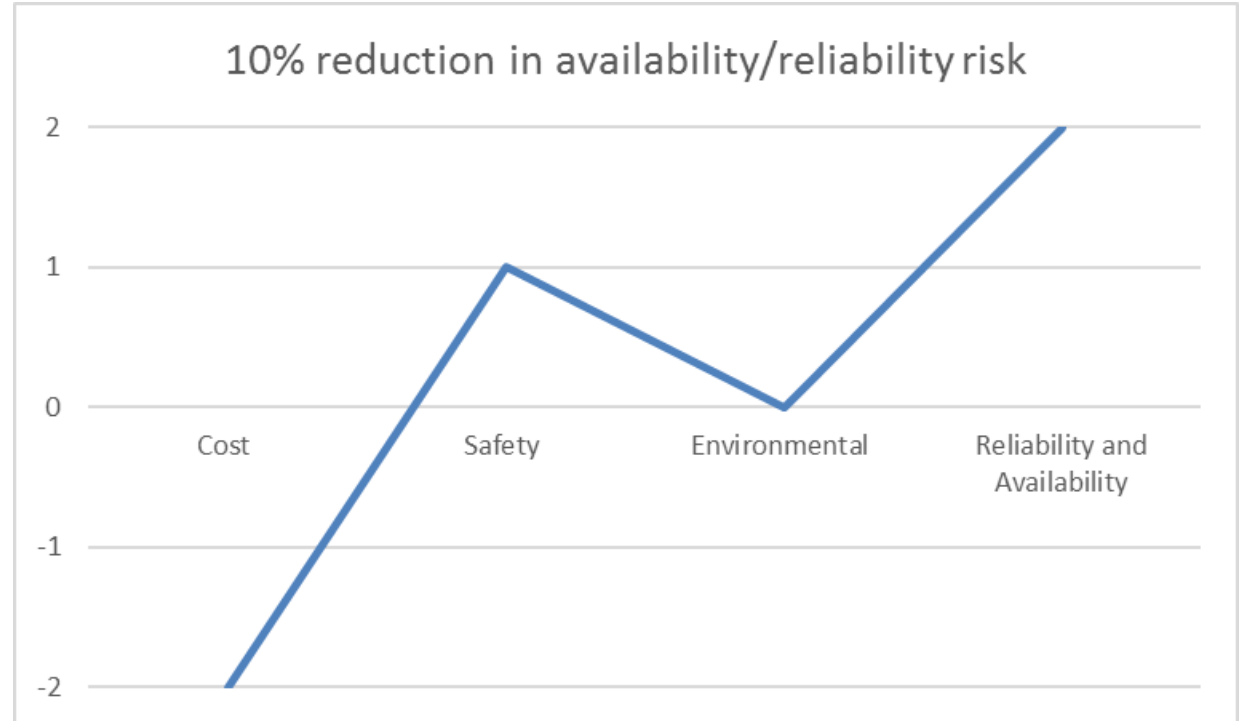
Which options would you like us to develop in to costed options?

**Option 9:
10% reduction in
availability/reliability
risk**

**Y Axis show Risk
Performance Impact**

**An Example:
Positive Cost Impact =
Reduced Costs**

**Negative Risk Impact =
Increased risks across
the network**



Question for discussion

Which options would you like us to model and turn in to fully costed options?

Over what period of time should we test our investment plans to demonstrate benefit to consumers?





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Voting

Our impact on you

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 - 3.
 - 4.
 5. Impacted a great deal

Question 3

Q: Are the default options the correct options?

1. Yes

2. Unsure

3. No

Question 4

Q: Is 25 years the right period of time to test our investment plans to demonstrate benefit to consumers?

1. Too short

2. About right

3. Too long

What we will do next with your input:

- Collate results from this and other stakeholder engagement events
- Determine Stakeholder preferences for modelling focus
- Model options with stakeholder influenced modelling approach
- Present costed options back to Stakeholders in Autumn



Responsible removal of redundant assets - Bridget Hartley

Environmental Requirements - Process



Remove environmental hazards that potentially risk polluting the land (and to an extent other environmental media)

Remove/ Remediate pollution which may have occurred during the life of the permit

Demonstrate that the site is in the same state as at the start of the permit

What do we mean by...

Decommissioning

Isolate / Mothball	Demolish	New Build
<ul style="list-style-type: none"> Plant and equipment is separated from every source of energy A positive isolation from the NTS and the Customer, involving a physical air-gap between the two assets Ongoing maintenance needed 	<ul style="list-style-type: none"> Redundant assets have been fully removed from the site Useful spares have been harvested Land returned to brownfield/ greenfield and potential alternative use where possible. 	<ul style="list-style-type: none"> Having removed the asset, a new asset is required in the future

Relative costs of 100km Pipeline

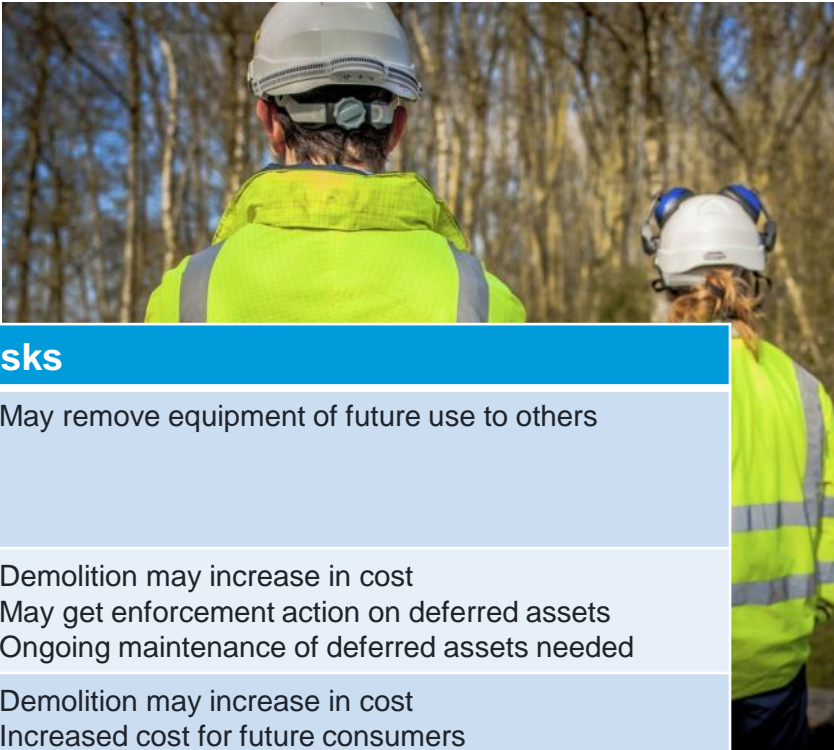
x1	X 88	X 124
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Relative costs for a Compressor

X 1	X 17	X 333+
-----	------	--------

When should we do this work?

- Timing needs consideration
 - Managing operational risks
 - Which consumers should pay?
 - Can we or others re-use assets?
 - Phasing of work & decisions



Option	Benefits	Risks
Deliver all in T2	<ul style="list-style-type: none"> • Current consumers fund removal of assets they benefited from • No ongoing risk to manage • No ongoing maintenance costs 	<ul style="list-style-type: none"> • May remove equipment of future use to others
Prioritise high risk projects and maintain remaining	<ul style="list-style-type: none"> • Costs are split between current and future consumers • Lower costs in T2 	<ul style="list-style-type: none"> • Demolition may increase in cost • May get enforcement action on deferred assets • Ongoing maintenance of deferred assets needed
Defer all works and manage risk	<ul style="list-style-type: none"> • Minimises costs in T2 	<ul style="list-style-type: none"> • Demolition may increase in cost • Increased cost for future consumers • Significant maintenance costs required to manage risk • Likely to get some enforcement action

Question for discussion

Q1: What are the implications of each option to:

- Customer
- End consumer
- Local community

Deliver all in T2

Prioritise high risk projects and maintain remaining

Defer all works and manage risk

Q2: What factors should we consider when we no longer require assets for operational use?





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Voting

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 - 2.
 - 3.
 - 4.
 5. Impacted a great deal

Question 5

Q: As a principle should current or future consumers pay for demolition of assets that are no longer required for operational use?

1. Deliver all in T2
Increased costs for current consumers

2. Prioritise projects based on risk and maintain remaining
Cost is shared between current and future consumers

3. Defer all works and manage risk
Majority of cost is picked up by future consumers

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Information Provision - Jenny Phillips

Scope of today

In scope						Out of scope					
Close to real time operational data						Medium to long term information					
	Timing of Availability				Current Platform						
	Before the day	On the day	Instantaneous	After the day							
Supply	✓	✓	✓	✓	Gemini/MIPI						
Demand	✓	✓		✓	Gemini/MIPI						
NTS Linepack (PCLP)	✓	✓		✓	Gemini/MIPI						
Capacity		✓		✓	Gemini/MIPI						
Weather		✓		✓	MIPI						
Shrinkage				✓	Gemini/MIPI						
Commercial Nominations	✓	✓			Gemini/MIPI						
Price	✓	✓		✓	Gemini/MIPI						
Pressure											
Gas Quality											



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Voting

Our impact on you

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 1. Not impacted at all
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Questions for discussion

What operational processes do you run that are dependent on National Grid data / information / insight?

What decisions do you make that are dependent on National Grid data?

When you view operational data, do you view it in its original source?

What do you value / what are you trying to solve by having visibility of National Grid decisions being made?



Question for discussion

What do you view as our key systems and what aspects of those systems do you value?

For the key means by which you gather data today, are there any aspects you would propose we improve or take-away?



Question for discussion

Against the categories of data / information / knowledge that we currently provide, are there any factors that you would start / continue/ enhance?

Are there any data / information / knowledge areas we don't currently provide that you would value?



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Q&A

Poll - Knowledge of our operational activities

- *On a scale of 1 to 5, where 1 is know nothing and 5 is know a great deal, how much would you say you know about National Grid's operational activities?*

1. Know nothing
- 2.
- 3.
- 4.
5. Know a great deal

Able to contribute?

Q: Based on all of the information available to you and thinking about the workshop as a whole, were you able to contribute to today's topics?

1. Yes

2. Some what

3. No

- And finally, what three words would you use to describe National Grid Gas Transmission?

What happens next

- Our commitment
 - We'll process everything you've told us today
 - We'll combine what we've heard today with the outcomes of the other regional and terminal events and send it to you by the end of July
 - We'll ask our Stakeholder Group to scrutinise this and we'll use it to form our RIIO-2 business plan
 - We'll publish our plan and all updates on our website, and keep you informed through our webinars and newsletters |

How to get in touch...

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Thank You