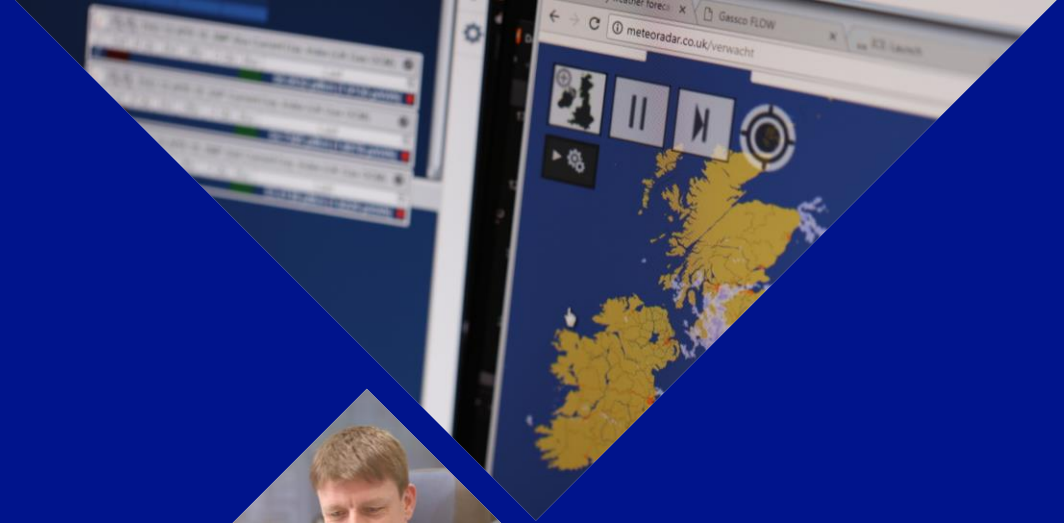
Gas System Operator

Gas Operational Forum



Radisson Grafton, London
17th October 2019

nationalgrid

Health & Safety

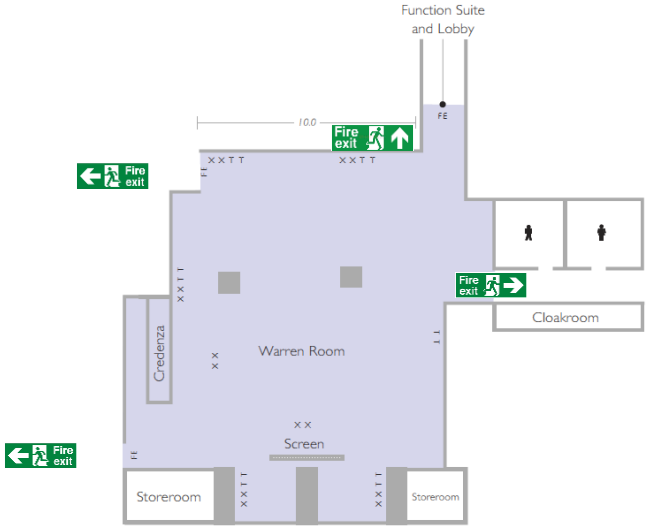
No Fire Alarm testing is planned for today

In case of an alarm, -please follow the fire escape signs to the evacuation point

This is at the rear of the Hotel by Fitzroy Square

Warren Room Fire Exits

There are 4 fire exits in the Warren Room, as shown be the map below



National Grid and Xoserve Attendees

- Karen Thompson
- Josh Bates
- Martin Cahill
- Suki Ferris
- Mark Rixon

- Carol Carlin
- Vinny Thiara
- Anita Kozlowska
- Sarah Carrington

- Rob Gibson

- Fiona Cottam
- Andy Simpson

Feedback & Questions

For any questions during the forum you can:

- Ask during the presentations
- Speak to an NG representative during the break
- Utilise the Query Surgery time at the end of the Forum

Agenda for Today

01	Introduction and previous actions	09:30
02	Operational Overview	09:40
03	Winter Outlook	09:55
04	Winter Preparations	10:10
05	Hydrogen in the NTS	10:50
06	GFOP Latest Publication	11:05
07	UIG Update	11:20
08	Brexit Update: BEIS, BBL	11:35
09	GEMINI Re-platforming	11:50
10	Transmission Workgroup update	12:05
11	RIIO T2 Incentives	12:15

Breaks:

Morning Break

10:25 – 10:50

Lunch Break & Query Surgery

12:30

Query Management go-see in breaks

Actions & Feedback since Last Forum

Item	Action	Detail
FWACV Services	Provide Clarification of NG position on FWACV Services	Following an internal review National Grid have decided to withdraw from the centralised FWACV process they have been executing on behalf of the DN's. Discussions are underway with the DN's to hand this process over. Further information on this transition will follow, in the mean time we welcome any comments from the industry regarding the level of service you would like to see going forward. Please send any comments to cara.finn@nationalgrid.com.
Data Centre Programme	Confirm Outage date for this	Outage will take place on the 16th November, with some impact on 19th and 21st (covered in slidepack this month)

Actions & Feedback since Last Forum

Item	Action	Detail
Industry to provide any further feedback on Prevailing View designs, NG to summarise comments	**Prevailing view prototype designs available for comment on NG data community site:** https://datacommunity.nationalgridgas.com/key-documents/data-enhancements-working-group/	**Comments so far included in handouts today**
Winter Webinars	**Will publish webinars throughout year – please let us know any useful topics.**	**Previously we have covered Operational Data user guides, Future of Gas, Commercial Tools, Constraint Management, REMIT, Key Documents etc.**
Exercise Arctic	**Feedback from exercise in early October**	**Next Month we will be presenting a summary of findings from this years exercise**

National Grid - System Outage

Last month we told you we needed to make some essential changes in November to our IT systems. These changes mean we will need to take a series of outages which will have impacts on they way we tell you about PCLP and also the data we display on our operational pages, the impacts being to data on the prevailing view page and within Data item explorer.

The changes we need to make will be done over a series of days, starting on **Saturday 16th November 2019,** with an outage of **6 hours**, commencing in the 16:00hrs hour bar.

We also need to take shorter outages on **19 and 21 November 2019** of around **3 hours**, these will be carried out during the same hour bar; 16:00hrs, after publication of the hourly information.

During the outages we will make opening linepack, demand & PCLP data available utilising the Active Notification Service (ANS), and we will update Prevailing View with this information too.

If you use electronic notifications to let us know supply and demand information you will be asked to revert to contingency arrangements during these periods, please do not send us electronic files/.emails as these will be not be processed.

Missing data will be retrospectively populated and made available.

Data will be made available during outages through ANS and Prevailing View

The following areas will be impacted:

- Electronic Notifications (Supply and Demand profiles submitted to National Grid)
- PCLP Data - Hourly Data
- Forecast Flows - Hourly Data
- Physical Flows - Hourly Data

Within Data Item Explorer the following will be impacted:

Obligated MIPI reports impacted	Impact During System Outage
NTSAFF-Aggregate Forecast Flows into the NTS	Continues to update with last good value
NTSAPF-Aggregate Physical Flows into the NTS	Total Outage to data - no updates – until System is backed up, next available hour bar will then be published by GNCC
NB92-System Status Information	Total Outage to data - no updates - until System is backed up, next available hour bar will then be published by GNCC
Physical Flows, Bacton IUK Entry	No data updates for duration
Physical Flows, Bacton IUK Exit	No data updates for duration
Physical Flows, Bacton BBL Entry	No data updates for duration
Physical Flows, Moffat Exit	No data updates for duration
GMRS Data	Updates with last good value until a new value is received

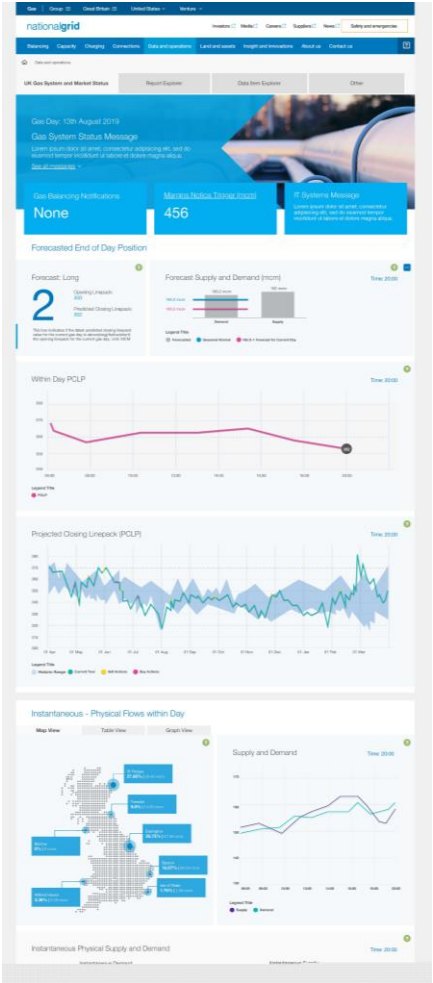
Data will be made available during outages through ANS and Prevailing View

Prevailing View

Prototype screens are available on the community website

Handouts today summarise feedback we have received so far including:

- **D-1 Demand Forecast**
- **Link to REMIT**
- **Mobile version**
- **Personalisation**
- **Screen Refresh**



Gas System Operator

02

Operational Overview October 2019

Martin Cahill

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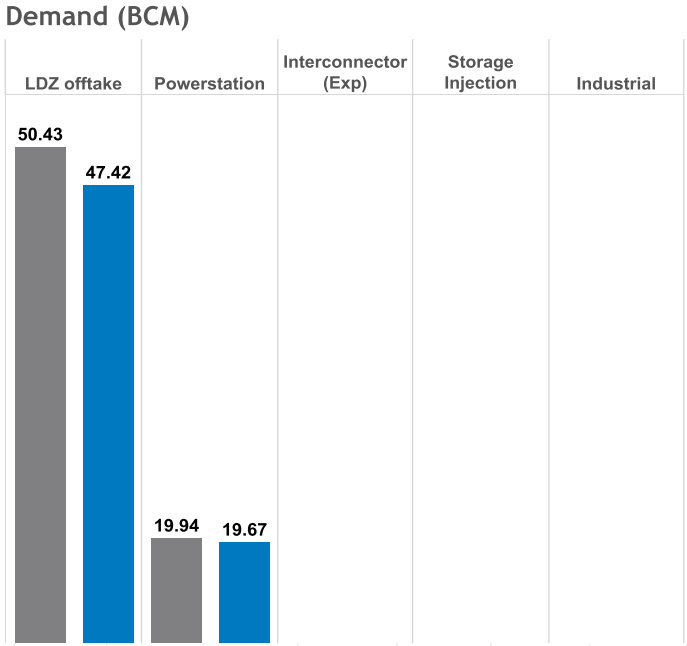
Demand by Category

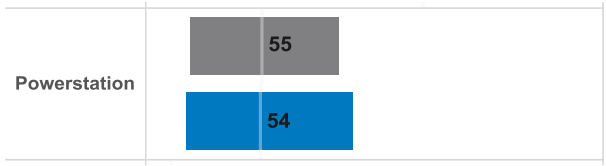
Gas Year 17/18 vs 18/19

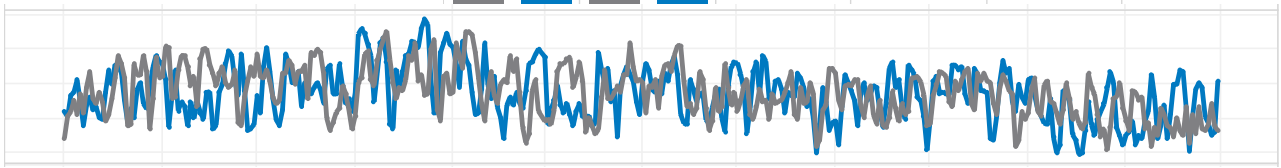
Decrease in total LDZ Offtake (Although in the summer the demand was higher)

Continue to see variable use of Gas Power stations, highly dependant on gas/electricity prices and weather (ability of renewable generation to run)

Interconnector Export similar





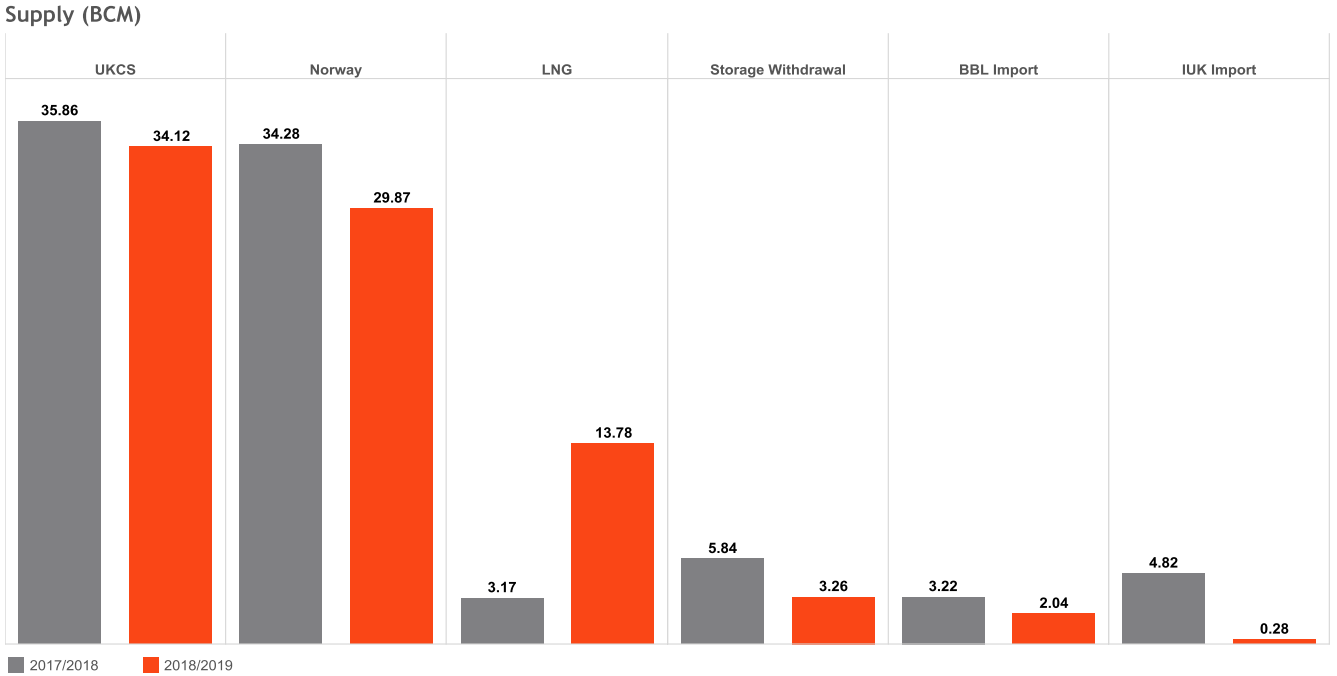


2017/2018 2018/2019

Supply by Category

UKCS has remained the largest supply of gas, with a proportionate drop in Norway supply this year

Interconnector also dropped, with increase in LNG

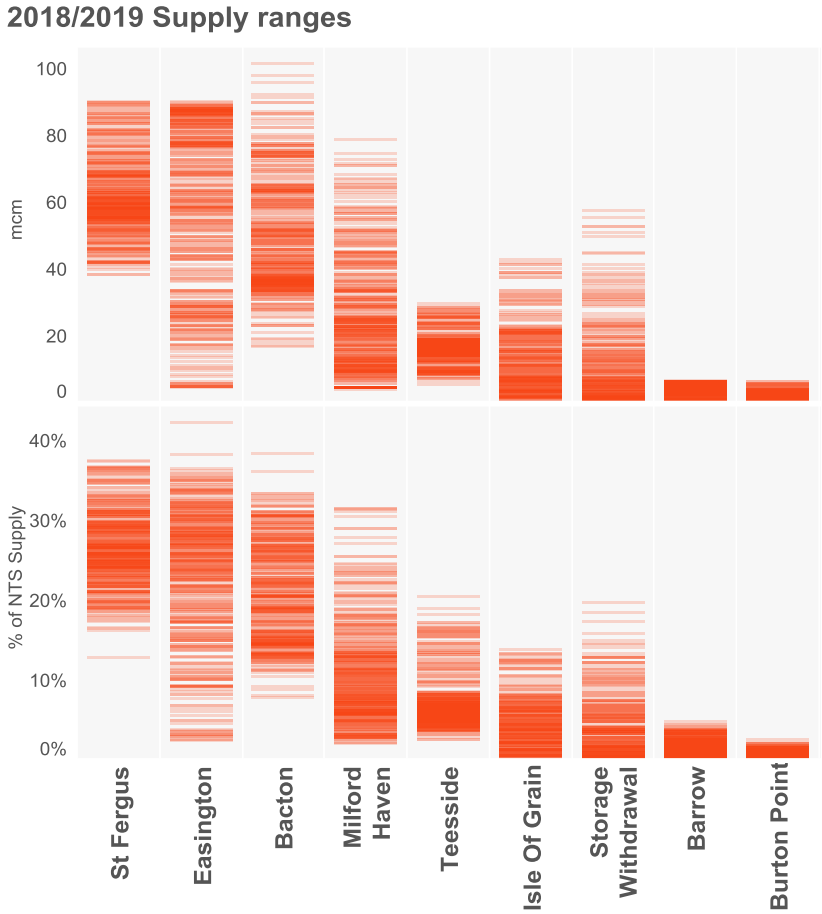


Supply Ranges

UKCS provides the most consistent supply source – see Fergus, Teesside, Barrow and Burton Point

Bacton includes Interconnectors, so more variability driven by Price differentials between NBP and Zeebrugge / TTF Markets

Easington has a particularly wide range, with a more flexible Norwegian Network with options for where gas is routed

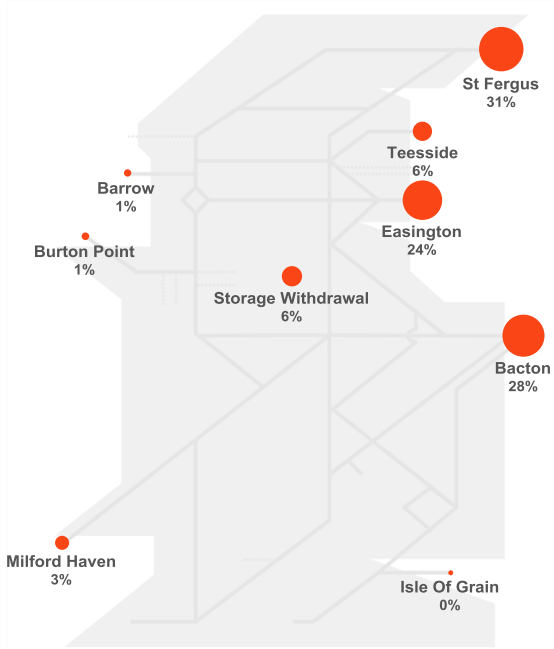


Supply by Location

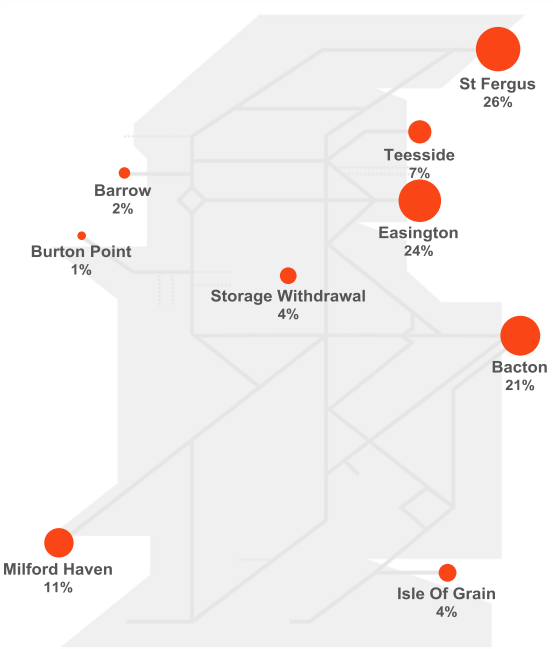
Graphic shows average supply % across whole year

While LNG has increased, the notable reductions in supply are at St Fergus and Bacton, historically the 2 main supply points

2017/2018 Percentage of total supply



2018/2019 Percentage of total supply



Recent Weeks – National Grid Trading

From 27th September to 12th October National Grid have bought on 11 different days, losing stock on 6 of these, and not selling once

Date	Linepack Change (mcm)	Volume Gas Bought (mcm)	Demand (mcm)
27/09/2019	-3.02	1.38	176.55
28/09/2019	-0.44	3.34	153.83
29/09/2019	+1.57	2.94	160.63
01/10/2019	+0.95	1.60	191.50
03/10/2019	-4.73	6.77	221.77
04/10/2019	+6.49	5.30	200.63
07/10/2019	-3.29	2.60	194.17
08/10/2019	-2.00	0.68	176.72
10/10/2019	-2.20	1.23	189.92
11/10/2019	+0.73	1.40	185.90
12/10/2019	+2.28	3.70	191.90

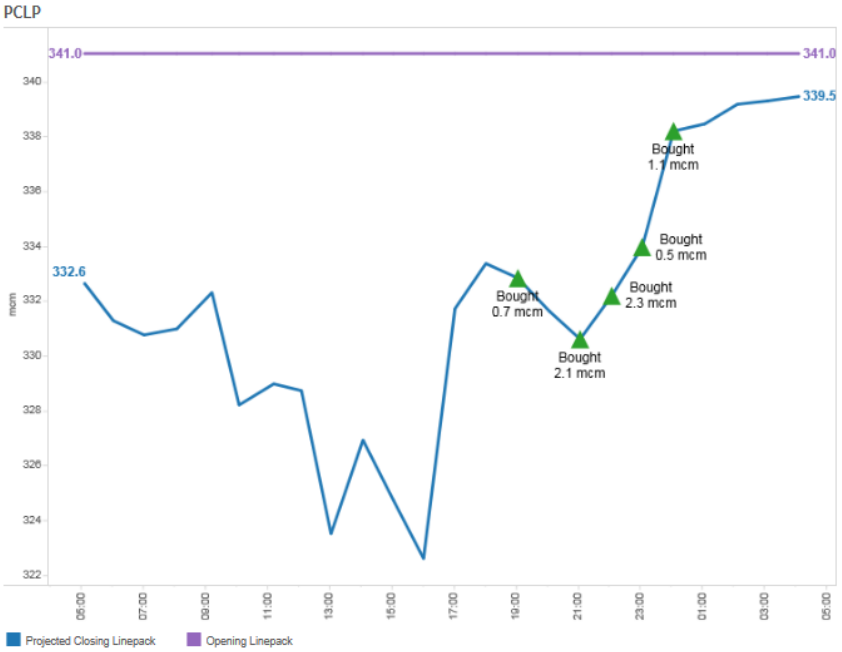
3rd October

Opening Linepack of 341mcm

PCLP reached a low of 322.6mcm at 4pm, after an increase in LDZ demand of 17mcm

After 4pm there was some response from LNG but interconnector exports through BBL and Moffat Increased

Bought light initially with a narrow spread



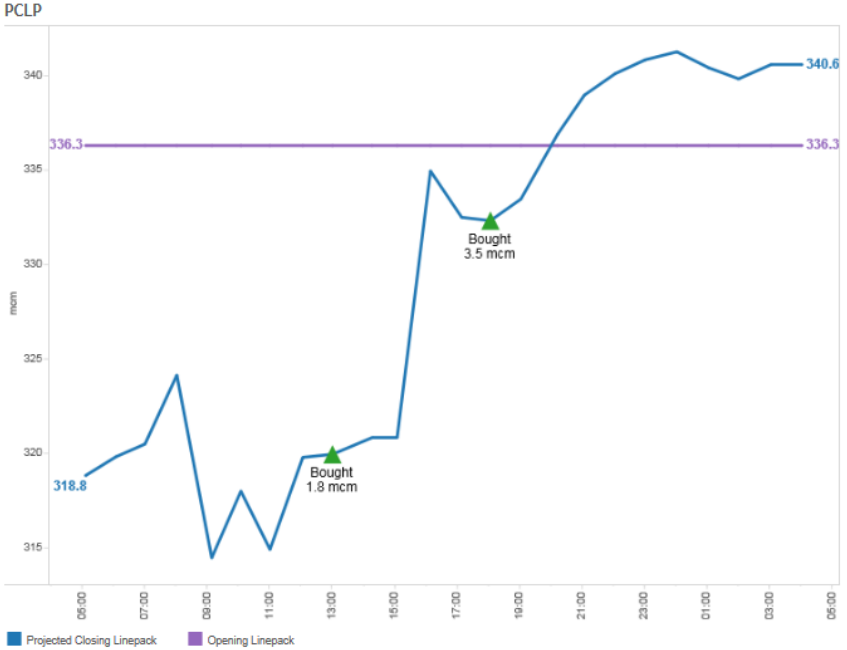
Gap started closing larger evening trades, but ran out of time resulting in a 4.7mcm loss across the day

4th October

Traded in the afternoon aiming to increase stock

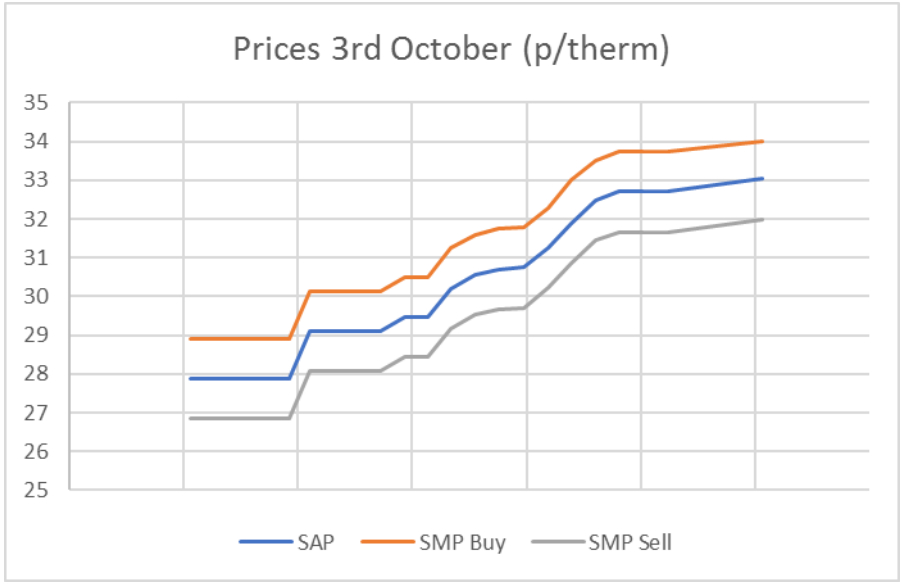
Market dropped below trading spread – potentially due to lower prices over the weekend and into Monday of the following week

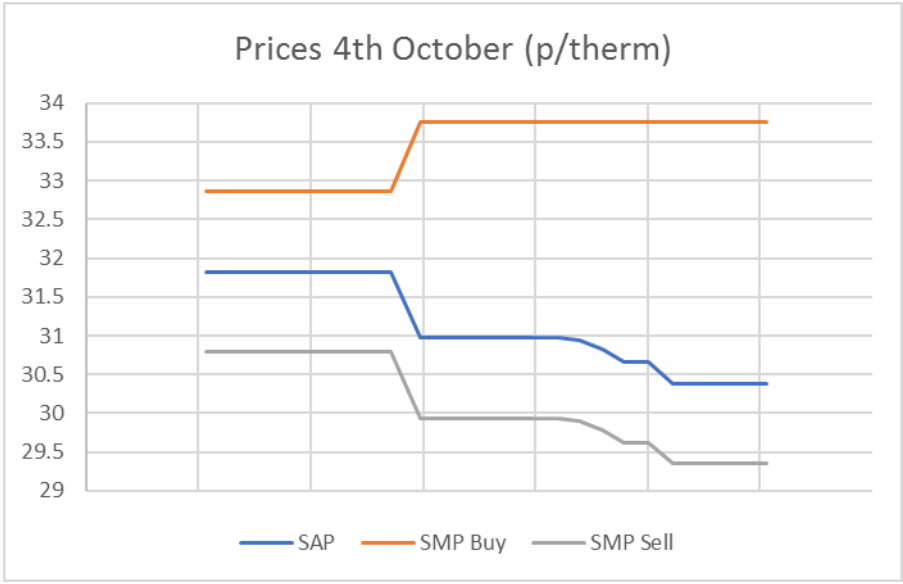
However still had a significant over-delivery on the day despite lower prices



Gain of 6.7mcm linepack across the day

Within Day Price Comparison





Loss of 4.73 mcm

Gain of 6.49 mcm

Gas Winter Outlook

Robert Gibson

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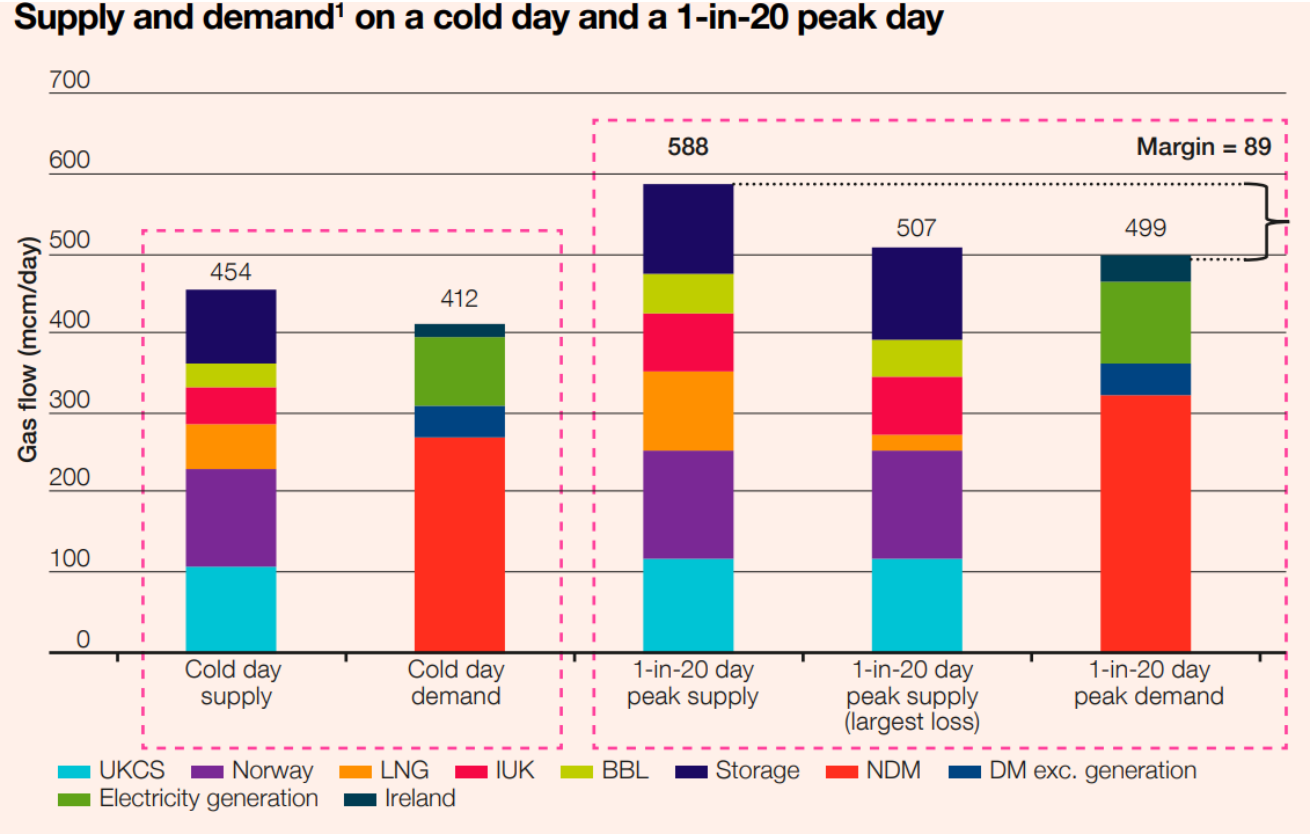
Gas supply margin



- Gas peak demand forecast is slightly higher than last winter.
- 1-in-20 peak supply is increasing.
- The N-1 test is passed.
- Gas supplies are diverse and flexible and global LNG production currently outstrips demand.

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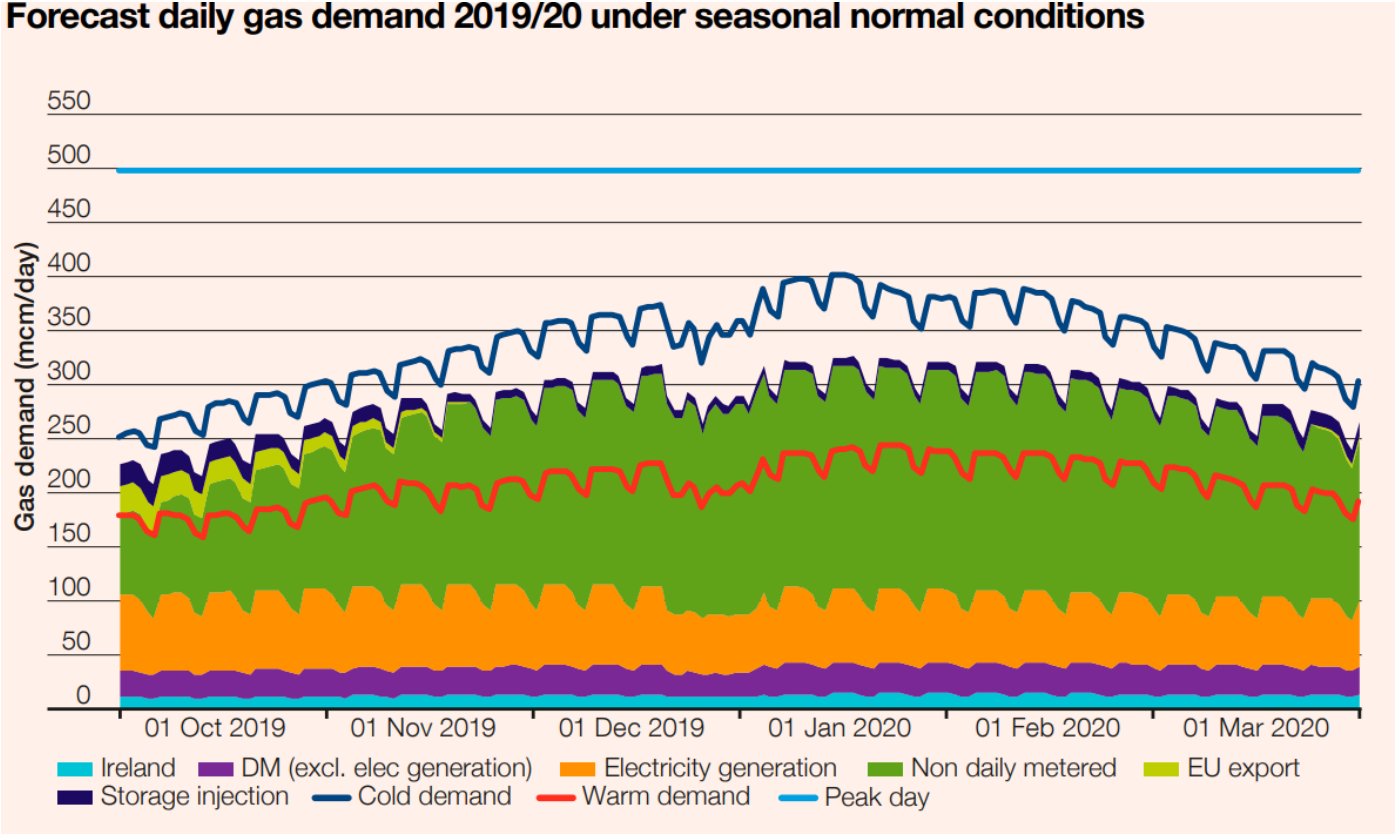
Gas demand



- Gas demand forecast for 2019/20 is 52.3bcm.
- Exports to Ireland are increasing, as production from the Corrib field declines.
- Forecast demand for gas fired-electricity generation is 11.7bcm.

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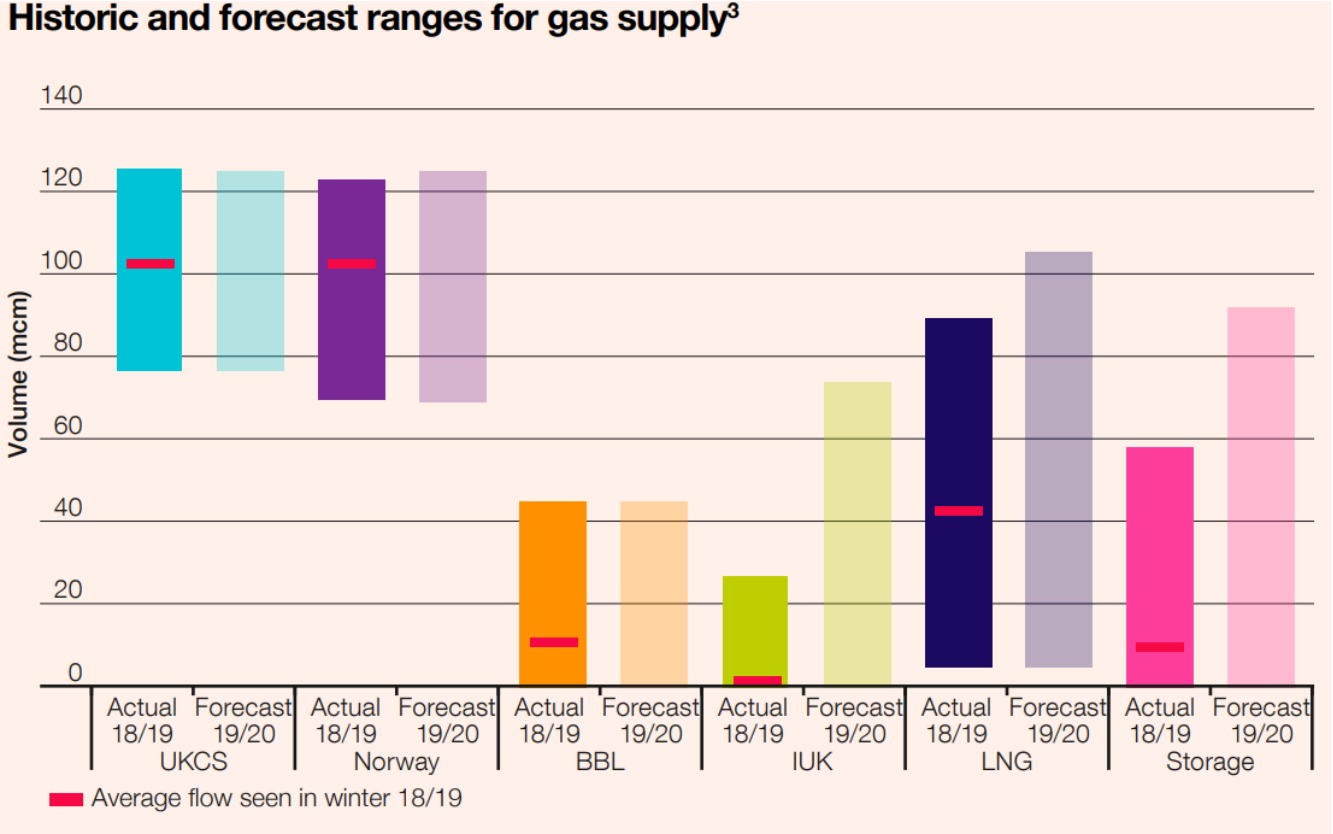
Gas supply



- We expect strong flows from the UKCS, similar to last winter.
- Non-beach supplies continue to be price responsive.
- Stock levels are currently high.
- Low storage withdrawal expected if LNG supply is high once again

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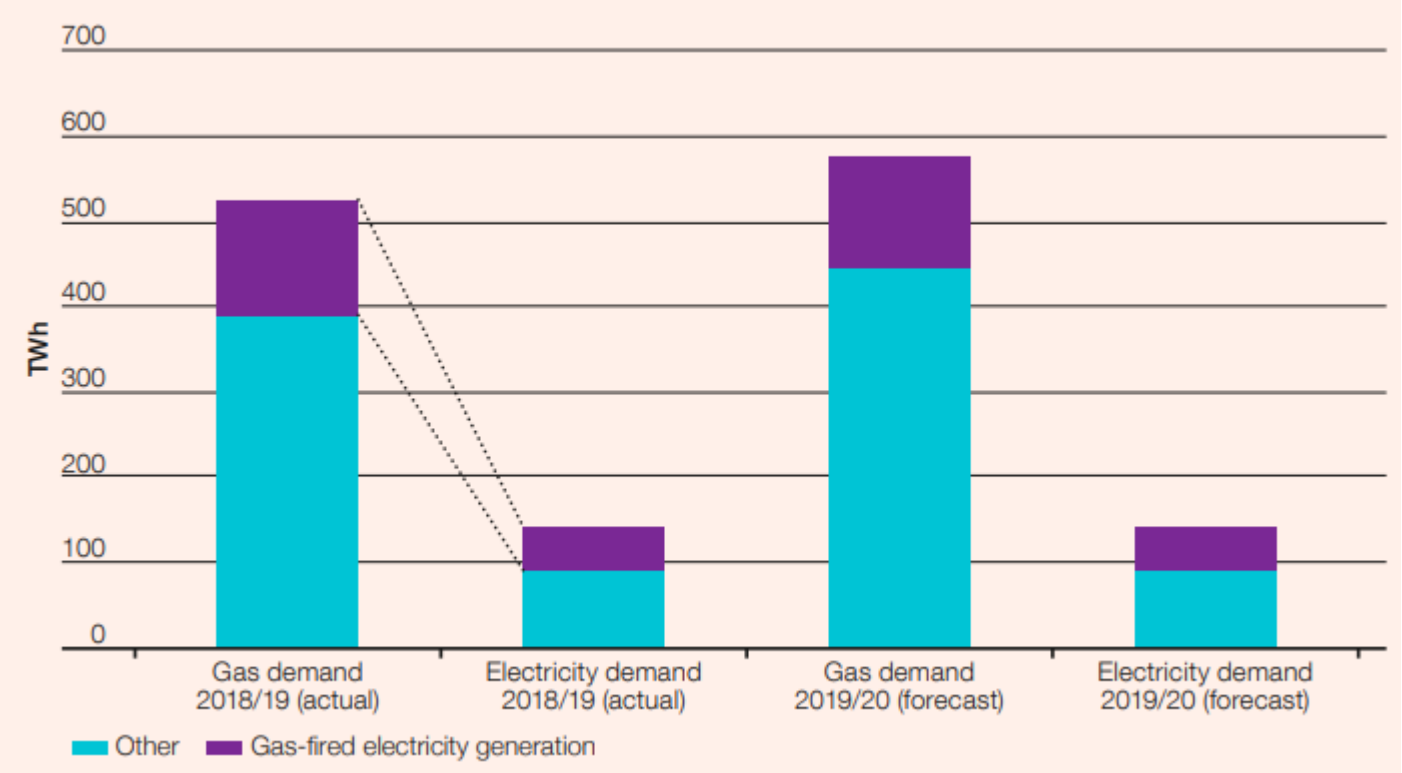
Whole energy system



- Viewed using the same units, it is clear to see that gas currently delivers significantly more energy than electricity.
- A large proportion of the overall gas demand is for the purpose of generating electricity..

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Key Messages

1
The margin on the electricity system is greater than last winter and well within the Reliability Standard set by the Government.

2
The gas supply margin is expected to be sufficient in all of our security of supply scenarios.

3
We anticipate no additional adequacy or operability challenges for the coming winter as a result of the UK's planned exit from the EU. We have tested our planning assumptions in a broad range of scenarios and via engagement with industry.

4
We have the tools and services we need to enable us to manage anticipated gas and electricity operability challenges across the winter period.

Gas System Operator

04

Winter Preparations

Josh Bates

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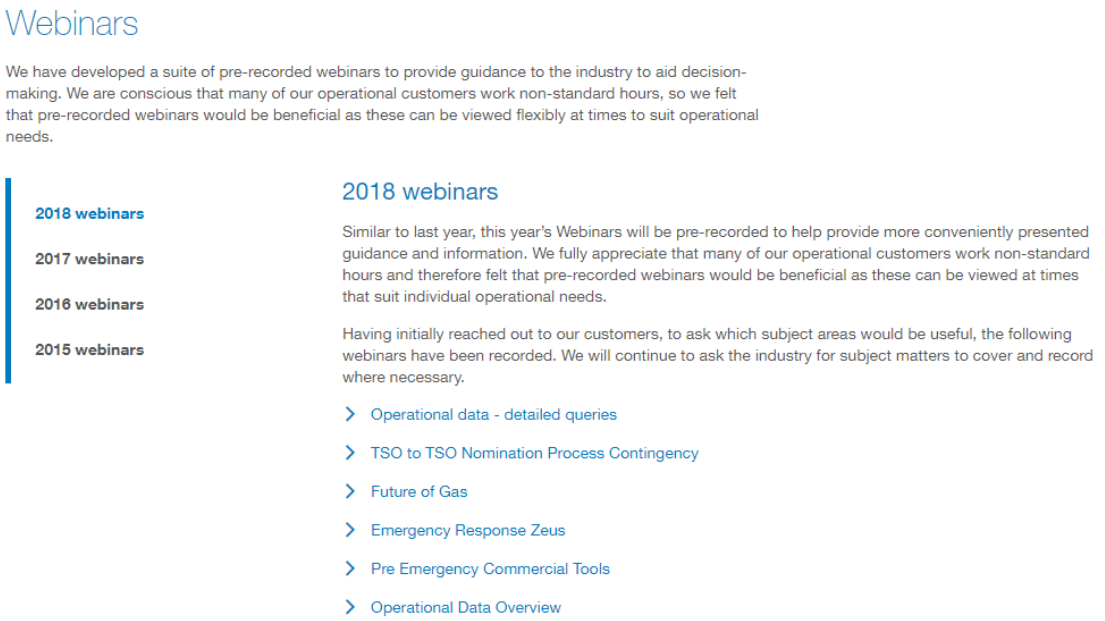
Webinars

Previously we have provided a range of webinars going into winter to aid preparation

e.g. Operational Data, Emergency Exercise, Commercial Tools

Can continue to provide throughout the year as well as winter



Webinars

We have developed a suite of pre-recorded webinars to provide guidance to the industry to aid decision-making. We are conscious that many of our operational customers work non-standard hours, so we felt that pre-recorded webinars would be beneficial as these can be viewed flexibly at times to suit operational needs.

2018 webinars

2017 webinars

2016 webinars

2015 webinars

2018 webinars

Similar to last year, this year's Webinars will be pre-recorded to help provide more conveniently presented guidance and information. We fully appreciate that many of our operational customers work non-standard hours and therefore felt that pre-recorded webinars would be beneficial as these can be viewed at times that suit individual operational needs.

Having initially reached out to our customers, to ask which subject areas would be useful, the following webinars have been recorded. We will continue to ask the industry for subject matters to cover and record where necessary.

- Operational data - detailed queries
- TSO to TSO Nomination Process Contingency
- Future of Gas
- Emergency Response Zeus
- Pre Emergency Commercial Tools
- Operational Data Overview

ANS Details

Active Notification System (ANS)

Throughout the year it is important that all Shippers ensure that their ANS information up to date.

We want to ensure that all Shippers are able to receive ANS messages so please could you check that the contact information registered against your Shipper entity is accurate by following the below link:

https://www.s2.emergencycallsecure.com/newlogin/

In order to access the system, you will need your Company ID, User ID and Password.

It is your responsibility to make sure that your contact details are correct so please make sure that you check everything is up to date.

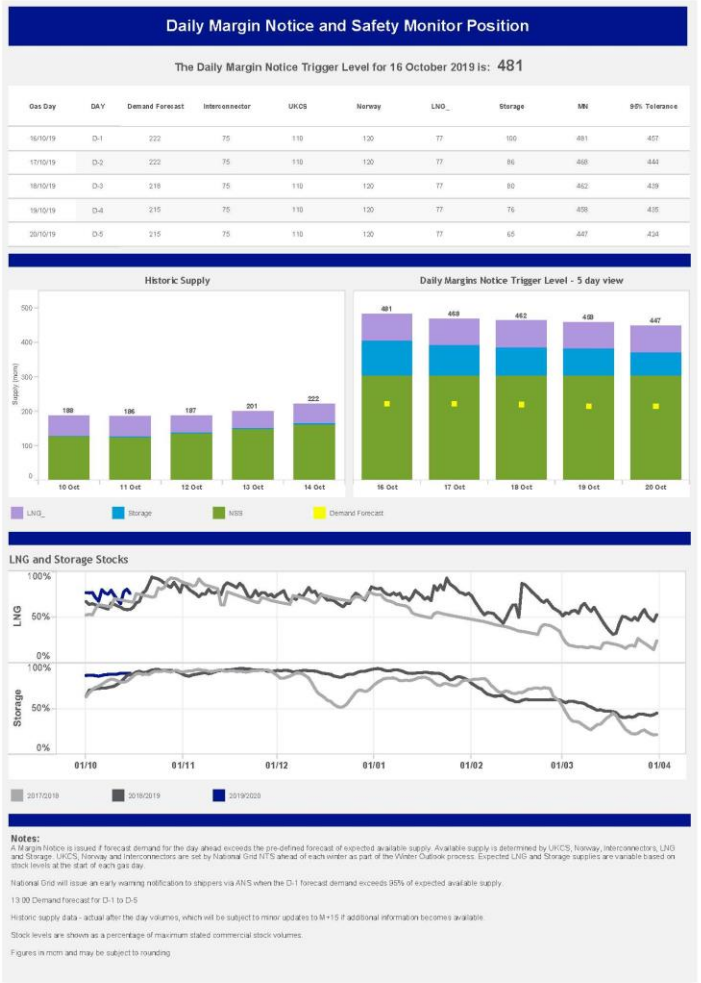
Daily Margins Notice

New Report for Daily Margins Notice now live

Includes Status page, as well as 5 day view (storage profiled to reduce during withdrawal across this time)

Safety Monitor Report included

https://www.nationalgridgas.com/balancing/margins-notices-and-gas-balancing-notifications



Exercise Arctic

Date : 2nd and 3rd October

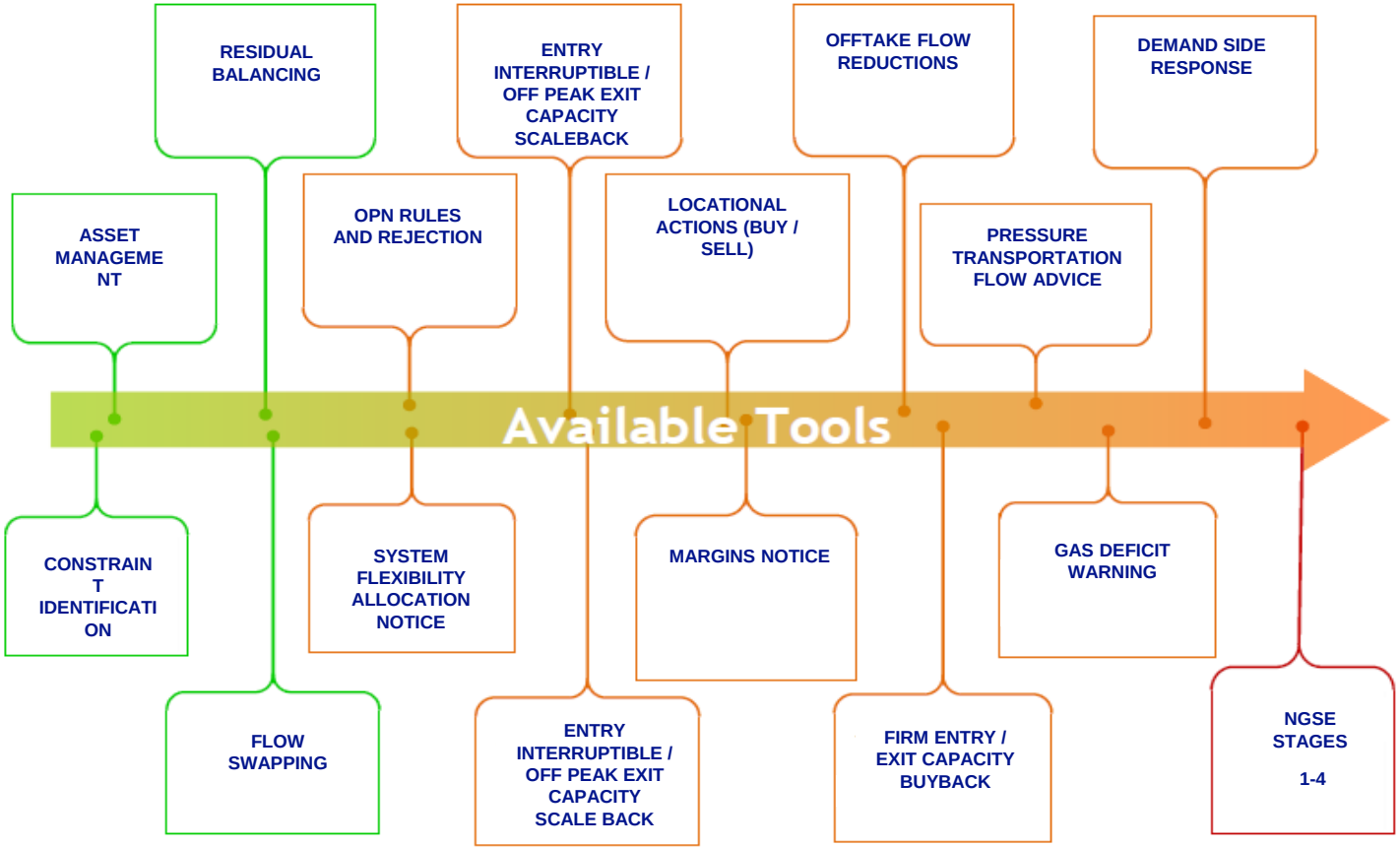
Aim: To demonstrate that the gas industry is prepared and able to meet its obligations in the event of a Network Gas Supply Emergency

Initial findings: Thank you to all those who participated in Exercise Arctic (over 300). Initial findings suggest the exercise was a success and the Network Emergency Coordinator has validated that the industry is prepared

Feedback: We are currently consolidating feedback, please provide any learnings from your organisation to: gasops.emergencyplanning@nationalgrid.com

Report: A full industry report will be issued January 2020, further initial findings at November's Ops Forum.

Commercial Tools - Exercise



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QUERY MANAGEMENT FEEDBACK

01 Query Portal – A customisable portal which Customers and Stakeholders can tailor and use to self-serve

Key Features

- Query Tracker
- Personalised Dashboards
- Favourites log
- 24/7 Feature

02 Chatbot – A digital interaction through instant messaging to guide Customers and Stakeholders to the information required.

Key Features

- Instant messaging services from laptops, mobiles or any smart device
- 24/7 Feature
- 100% Response rate
- Use as a search facility for key documents and web links.

03 Customer Account Managers –

A team that are responsible for the management and relationship for National Grid's Customer and Stakeholders.

Key Features

- Dedicated person that understands your business.
- Single point of contact
- Escalation route
- Stronger business relationships

With the total allocation of 10 points, please can you prioritise which concept from the above you would value the most to help with Query Management.

QUERY PORTAL	CHATBOT	CUSTOMER ACCOUNT MANAGER	GRAND TOTAL
			10

Gas System Operator

Morning Break

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Gas System Operator

05

Hydrogen in the NTS

Suki Ferris

nationalgrid

HyNTS

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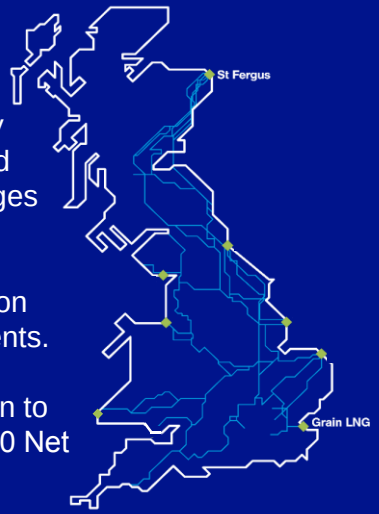
HyNTS is a programme of work that seeks to identify the opportunities and address the challenges that transporting hydrogen within the National Transmission System (NTS) presents. This will unlock the potential of Hydrogen to deliver the UK's 2050 Net Zero targets.



Currently we have three projects live in our HyNTS programme:

Project Cavendish

A review of the potential of the Isle of Grain region to use existing infrastructure to supply hydrogen to London & the South East including generation, storage, transport and CCS.

Hydrogen Flow Loop

Offline test loop to evaluate metallurgy changes on existing NTS steel pipe and new MASIP pipe when exposed to 30% hydrogen, identifying next steps to assess the NTS' suitability to transport hydrogen.

NTS Hydrogen Injection

To identify the requirements to enable a physical trial of Hydrogen injection into the NTS, identifying the gaps in the safety case and indicating the most suitable NTS location for a live small-scale trial.

Two projects are under development:

Hydrogen Deblending

To assess a variety of hydrogen recovery technologies and develop concept designs for selected options including a techno-economic review and identify the requirements for a demonstration project.

H21 Network Operations NIC 2019 Bid

Supporting NGN's 2019 NIC Bid alongside the other GDNs to address the impact of 100% hydrogen distribution from LTS offtake to the consumers meter, encompassing the potential impact on current operational and maintenance activities, regulations and procedures.

Two projects are now completed:

Feasibility of Hydrogen in the NTS

A feasibility study with the aim of determining the capability of the NTS to transport hydrogen. Includes a review of relevant assets, pipeline case study and draft scope for offline trials.

Aberdeen Vision

A feasibility study for the generation of hydrogen at St Fergus using the NTS (up to 2%) to supply the city of Aberdeen. Includes generation, injection, separation and transport.

Feasibility of Hydrogen in the NTS

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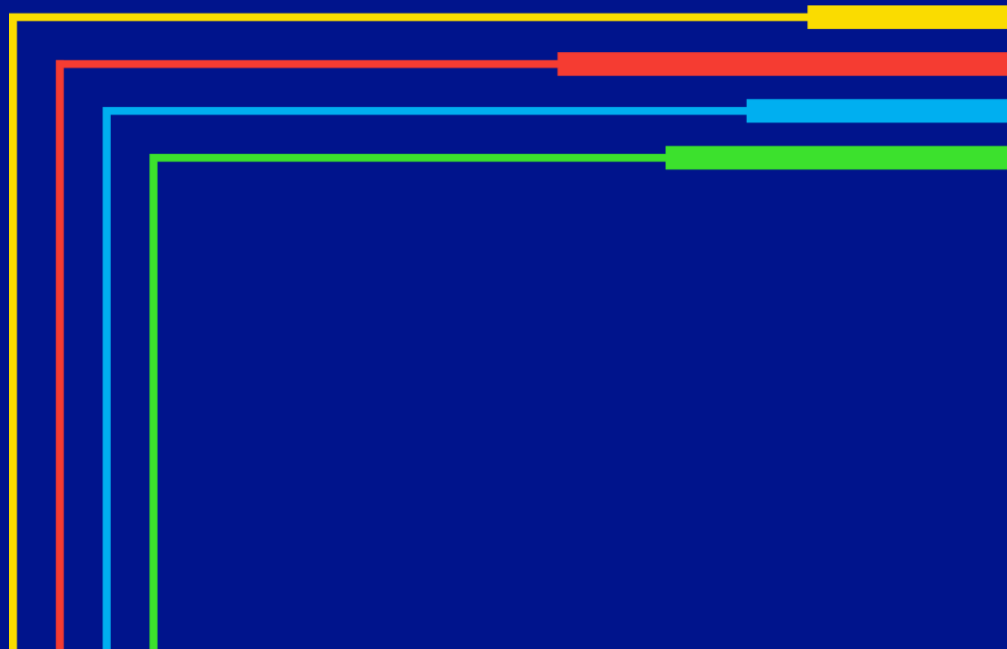
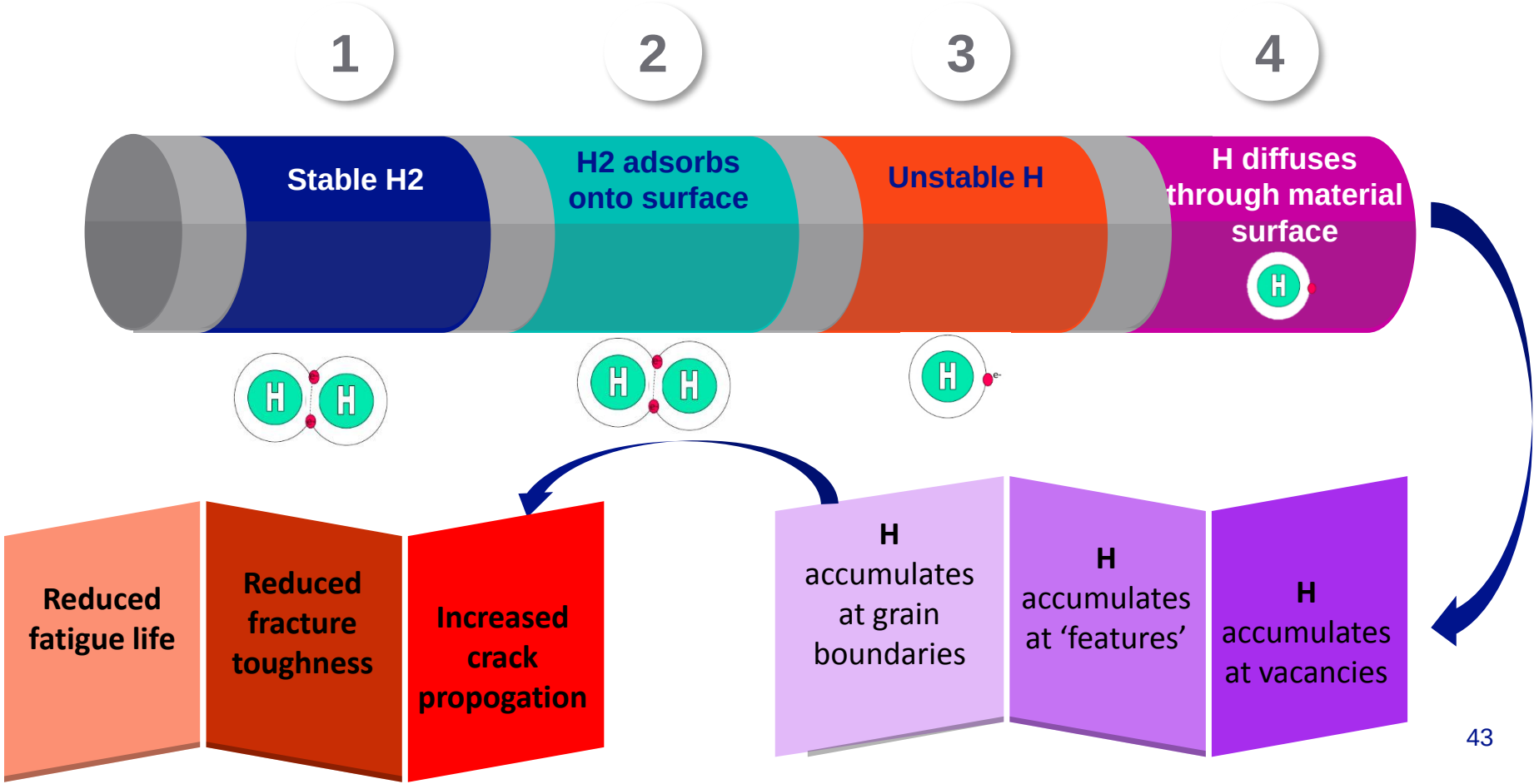


Details of study:

- 6 month literature review (extended to 9 months)
- Undertaken by the Health & Safety Laboratory
- 150 sources evaluated
- Covers range of hydrogen concentrations (2%, 20% and 100%)
- Focuses on material impacts on pipelines

Fundamentals of hydrogen embrittlement



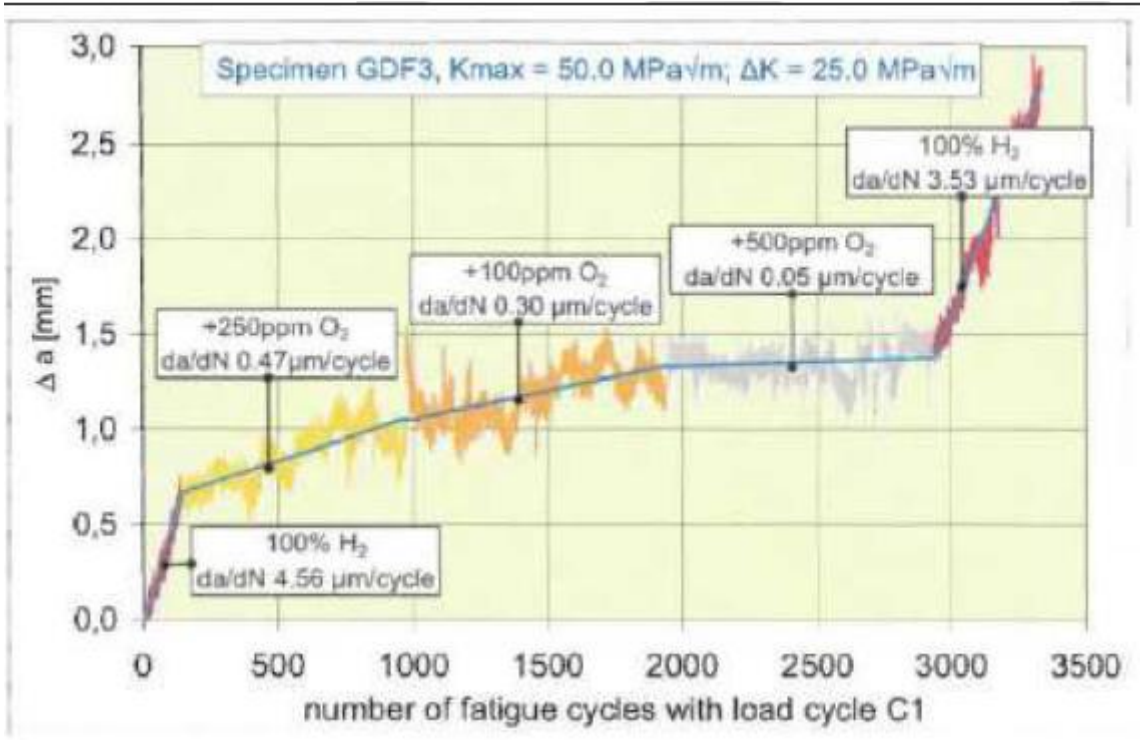
Oxygen addition

- **Oxygen has been repeatedly shown to inhibit crack growth rate and restore fracture toughness**
  - It is expected that concentrations as low as 500ppm (0.05%) would be suitable for most NTS applications

Our current limit for oxygen under GS(M)R is 0.2%

- **"Oxygen appears to be uniformly beneficial for all cases"**

Oxygen preferentially onto sites **where H would have otherwise liked to diffused into**



Summary

- Hydrogen has a number of negative effects on the material properties of pipelines and other materials
- However oxygen can mitigate most of these effects even at very low concentrations
- Re-purposing of the NTS to transport hydrogen is technically feasible, from a materials perspective, pending the outcome of the recommended work

Physical trials of H2 in the NTS:

Hydrogen Flow Loop

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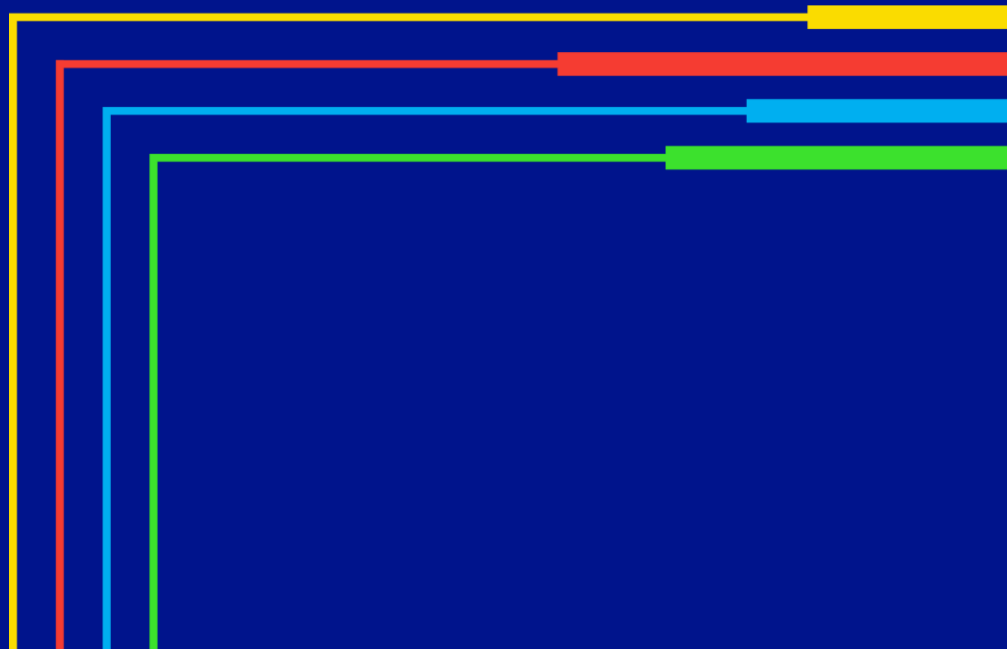
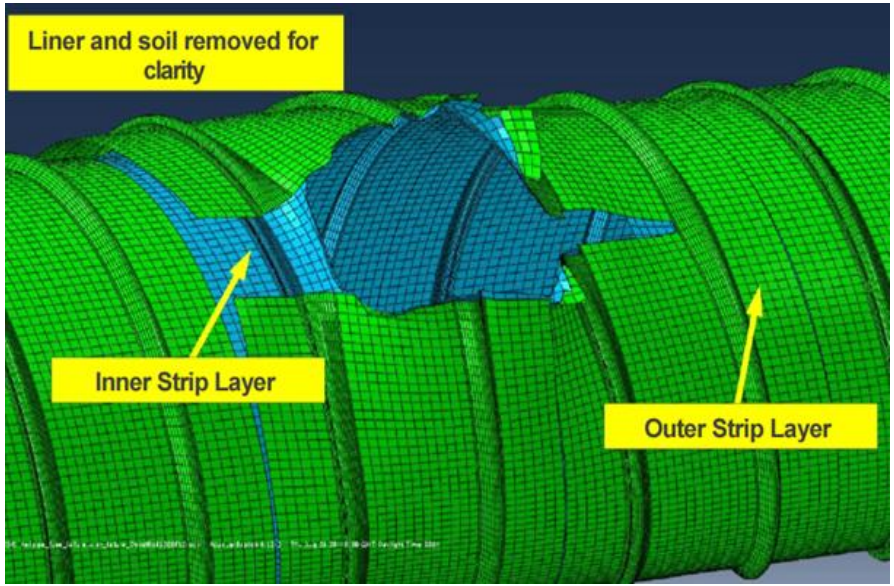


Background

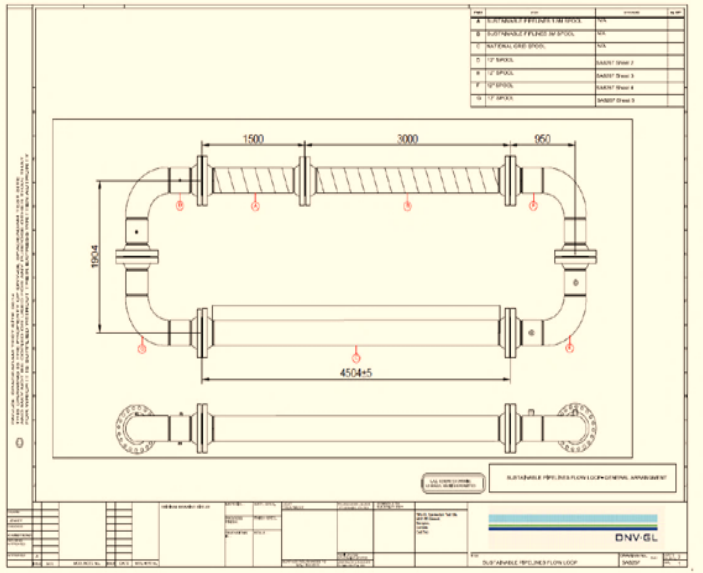
- **MASIP** [Mobile Automated Spiral Interlocking Pipe] **spiral wound pipe.**
- **Next generation of Steel Strip Laminated Pipe**.



Proposal

To examine impact of transporting 30% hydrogen and 70% methane via NTS.

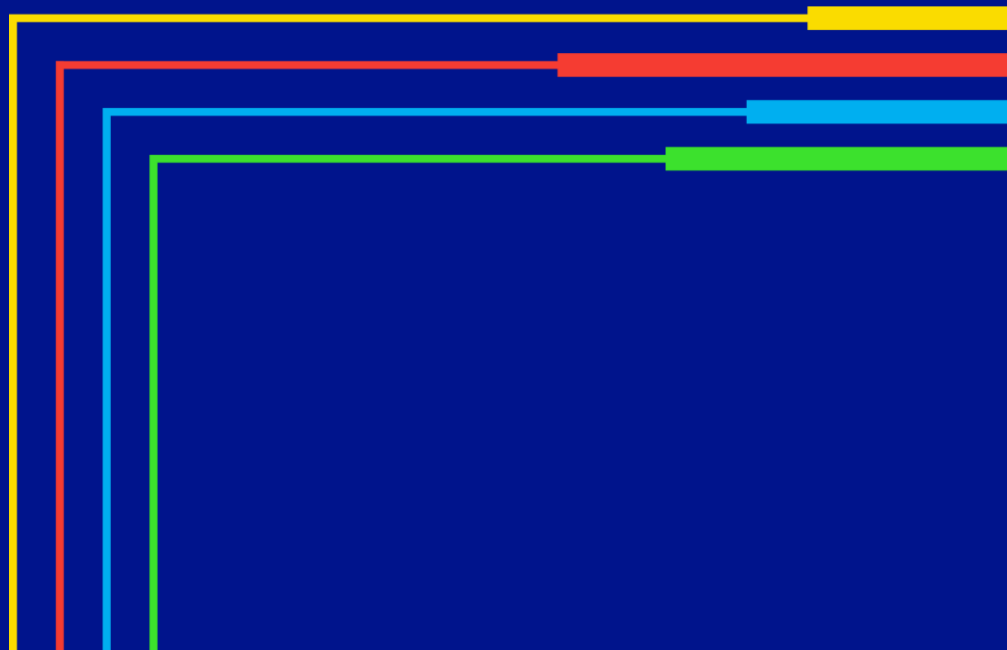
- National Grid needs to understand the implications of hydrogen rich gas mix may have on X52 12” pipe.
- Evaluating this type of steel against the resistance to hydrogen embrittlement of high strength steel welds.
- Potentially validate that is safe transport hydrogen through the NTS.



A regional approach to a hydrogen transition:

Project Cavendish

nationalgrid



Project Cavendish

Objective

A review of the potential of the Isle of Grain region to use existing infrastructure to supply hydrogen to London & the South East including generation, storage, transport and CCS.

Start	Feb 2019
End	Feb 2020
Fund	NIA Project

Networks

- → NGGT (Lead)
- → Cadent
- → SGN

Deliverables

Discovery: review of gas network to meet heating demand, technology for separating hydrogen / methane blend, geological review of Isle of Grain, link with TfL.

Design & Modelling: technical concepts development, CO2 reduction implications, business model, mapping the end state – future vision of hydrogen in South London.

Analysis: refine cost estimates, wider economic benefits, examine commercial / funding options, regulatory arrangements required, road map,

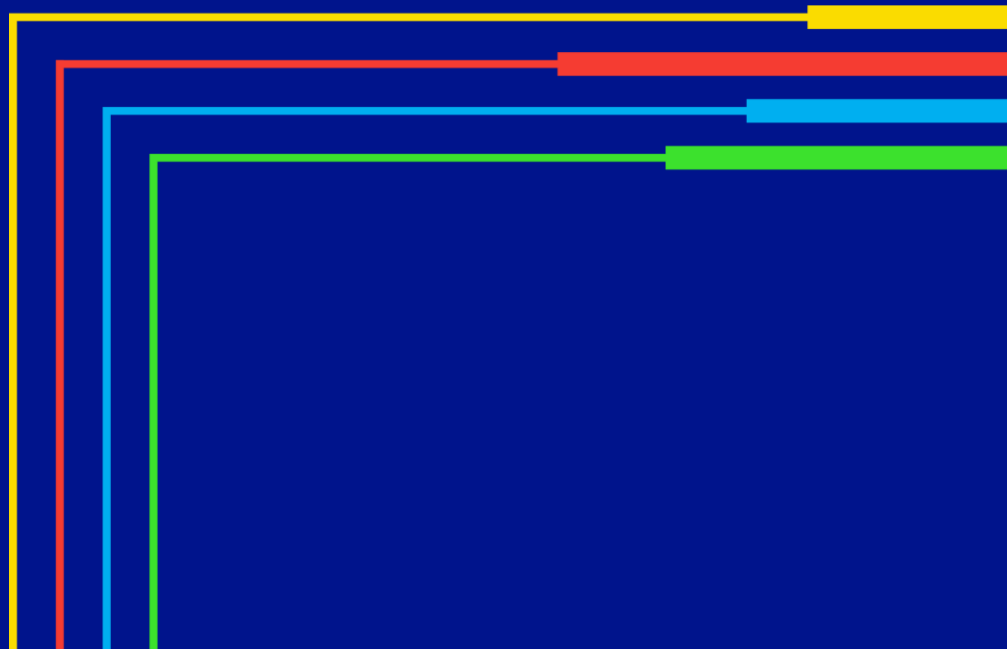
Key Findings & Next Steps:

- → Delivering Hydrogen to power generation has the biggest opportunity
- → Hydrogen could be utilised by TFL to decarbonise the tube and buses
- → New findings on hydrogen production methods that capture 97% of CO2
- → FEED study now required – there is an opportunity for GT to have a Hydrogen pipeline and for NGV to have storage and production

Maintaining optionality in a H2 transition:

Hydrogen Deblending

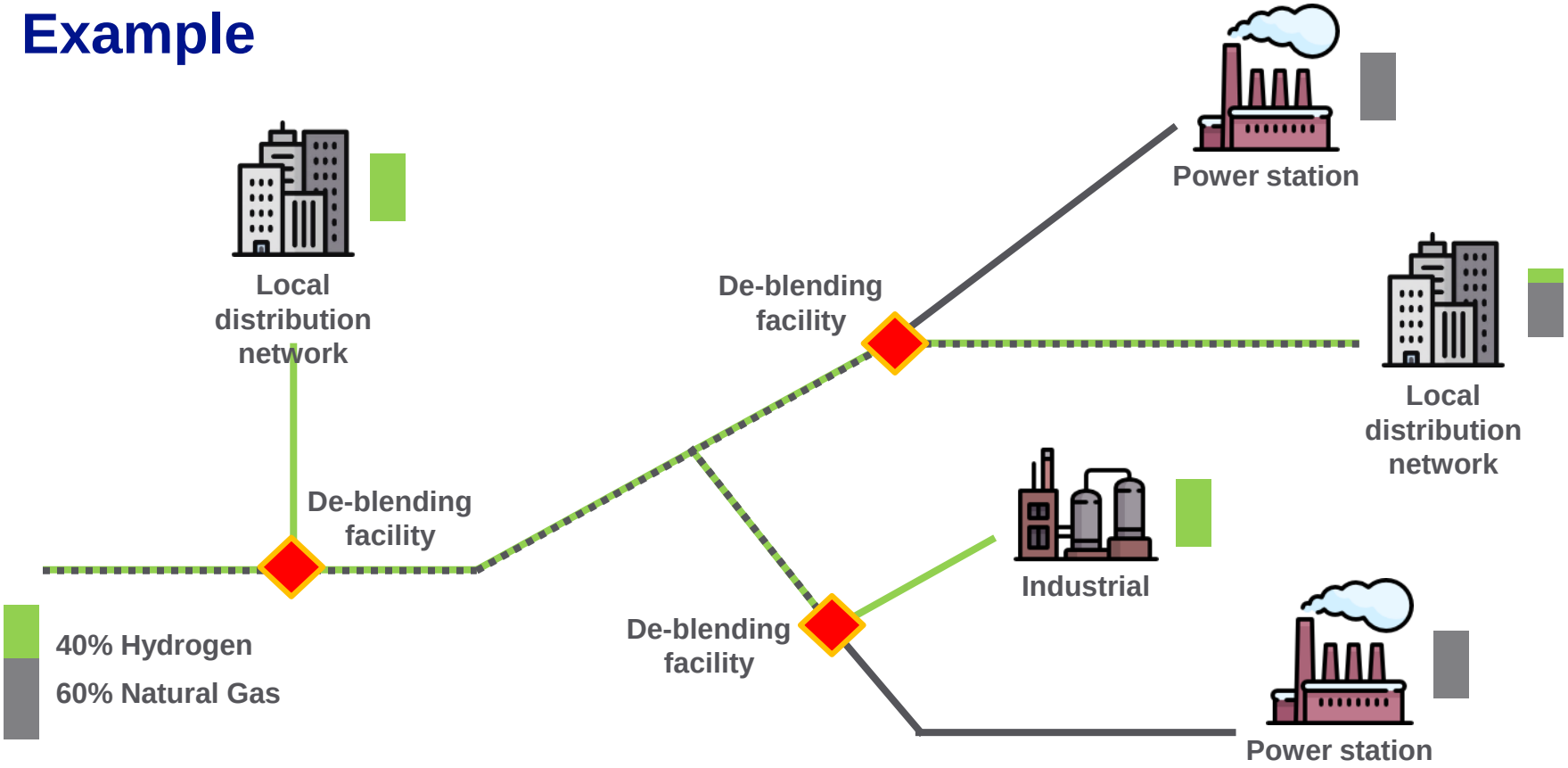
nationalgrid



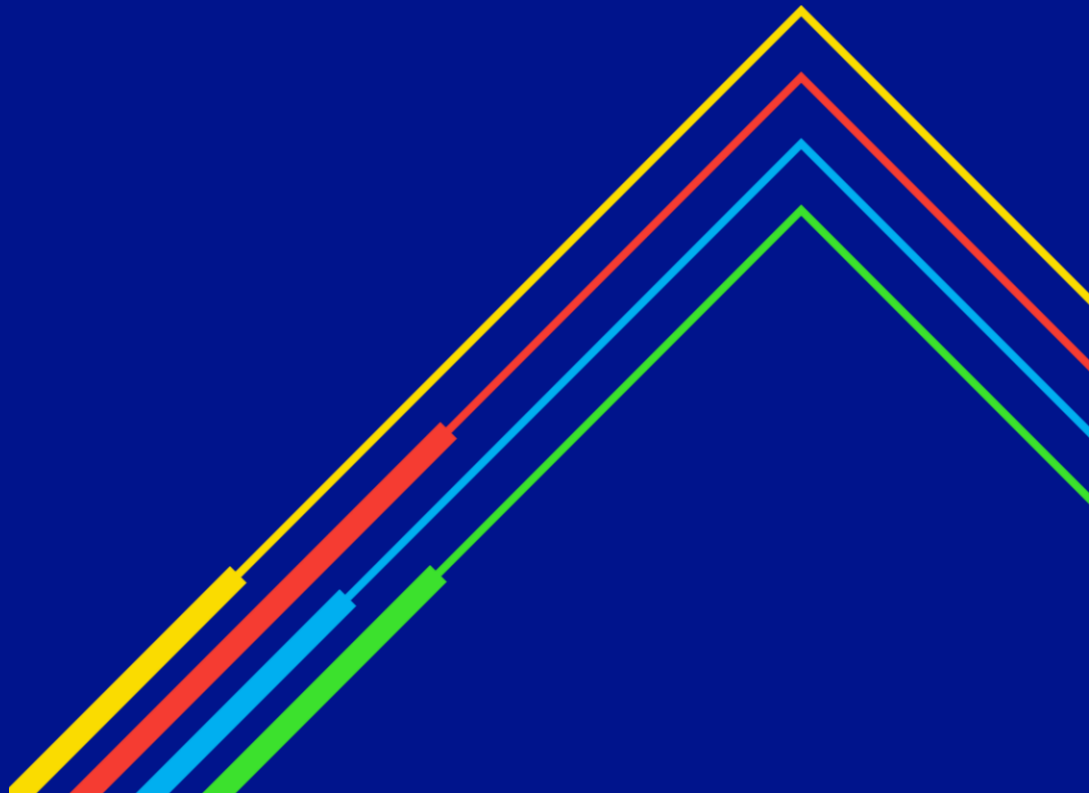
Why de-blending?

- **Blending H2 could be enabler to support a transition to a decarbonised hydrogen gas system**
- **However, certain customers may unable to accept hydrogen blends.**
- **Maintaining optionality for our costumers and end consumers could prevent blockers to a potential rollout**

Example


Power station
Local distribution network
De-blending facility
Local distribution network
De-blending facility
Industrial
De-blending facility
Power station
40% Hydrogen
60% Natural Gas

Conclusions & Next Steps



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GFOP Latest Publication

Suki Ferris

nationalgrid

GFOP Publication October 2019

- The GFOP Stakeholder feedback summary was published on Tuesday 8th October. You can find it on our website here: https://www.nationalgridgas.com/insight-and-innovation/gas-future-operability-planning-gfop
- Thank you for your feedback & contributions to date
- Overview of publication……..

GFOP Interactive.pdf

Next steps:

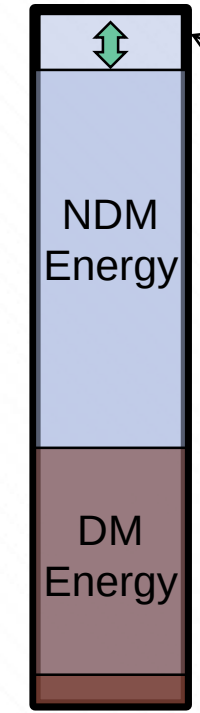
We really want to hear your views on:

- Whether this style works
- What you think we should prioritise our future GFOP studies on.

Unidentified Gas

NTS Ops Forum October 2019

Recap – Calculation of Unidentified Gas



Total gas measured into the LDZ via the Network Operator's equipment

UIG = Balancing figure in the LDZ

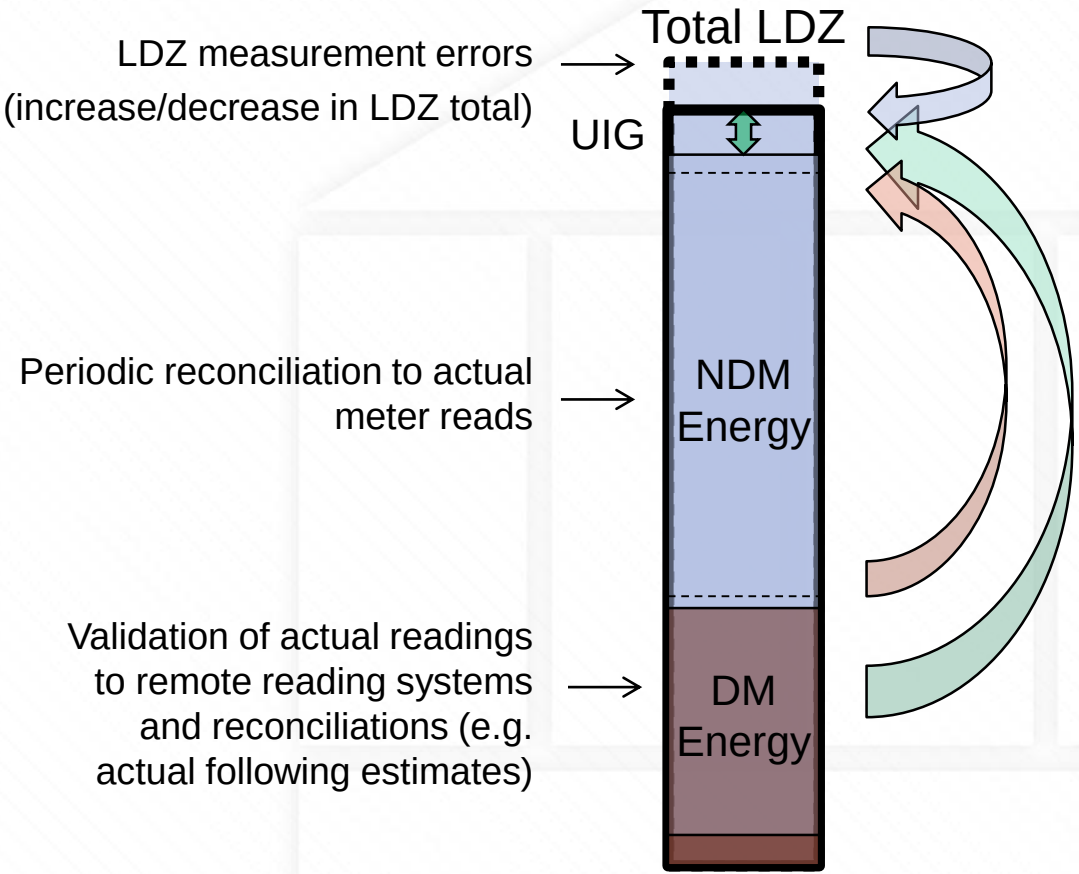
Non-Daily Metered Algorithm and actual weather data

Daily Metered measurements obtained using automated meter reading equipment

Fixed daily amount provided by the Network Operator

- Concept of daily UIG was introduced at same time as the gas industry's Project Nexus changes to systems and processes in June 2017
- Xoserve only receives daily readings for around 1,500 sites – even though there around 7 million Smart meters
- Remainder are subject to daily estimation
- Initial UIG position is calculated each day, and refined over time as periodic meter readings are received

Recap – Subsequent Refinement – Reconciliation

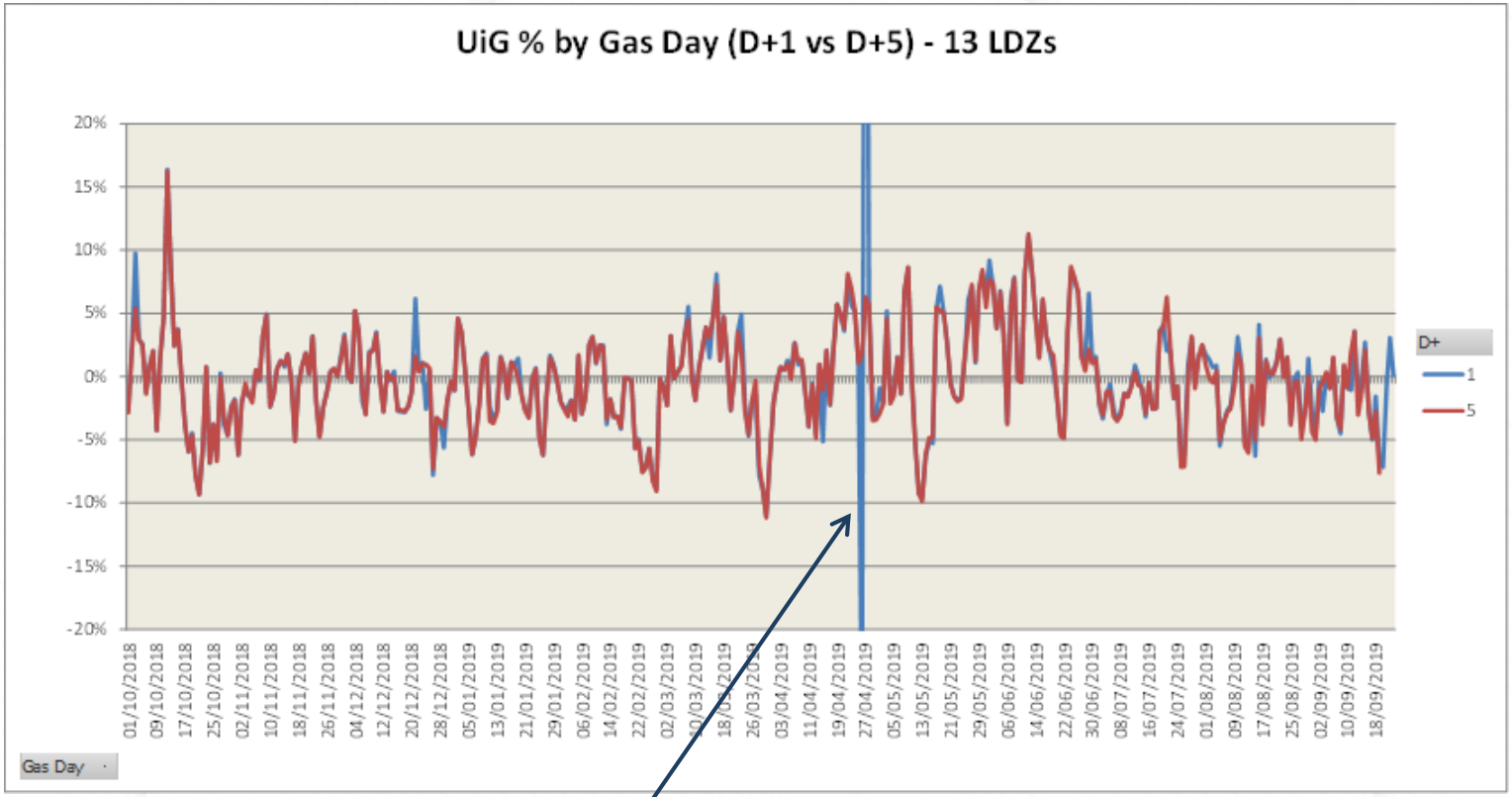


- Daily energy measurements and estimates are subject to subsequent refinement – referred to as Reconciliation
- The equal and opposite of each site level (“meter point”) reconciliation is an increase/decrease in UIG
- Reconciliations can flow for up to 3 to 4 years after the day in question
- If the meter is only read monthly or annually there will be no insight as to the daily levels of gas usage

Update on UIG Task Force

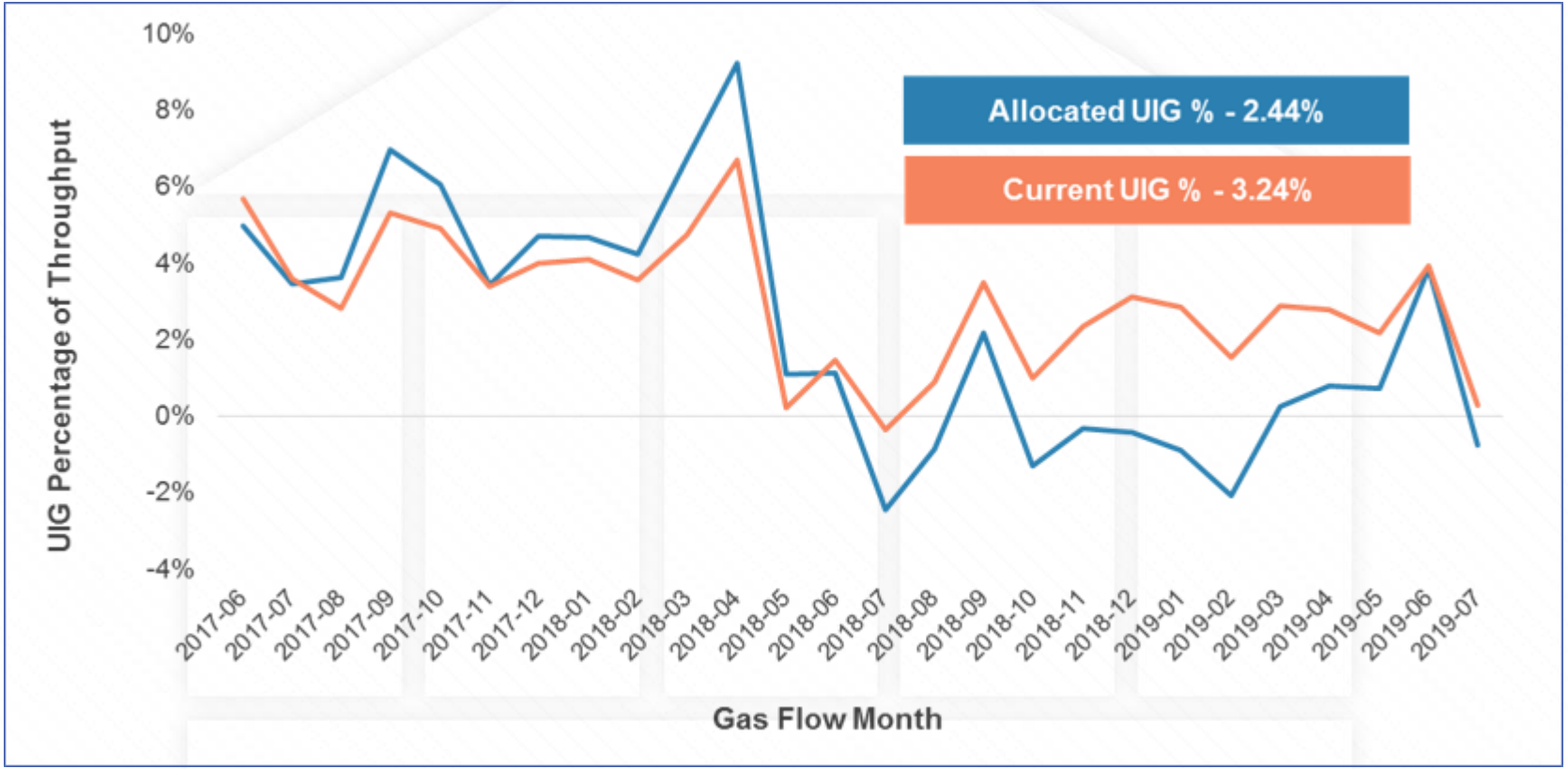
- UIG Task Force continues to issue monthly updates
- September update on Xoserve.com:
- https://www.xoserve.com/media/7241/uig-update-16th-september-2019.pdf
- Xoserve also publishes latest stats as visuals – search *Interim UIG Reporting* on Xoserve.com
- *Next 2 slides show latest stats*

Daily UIG since start of Gas Year 2018/19



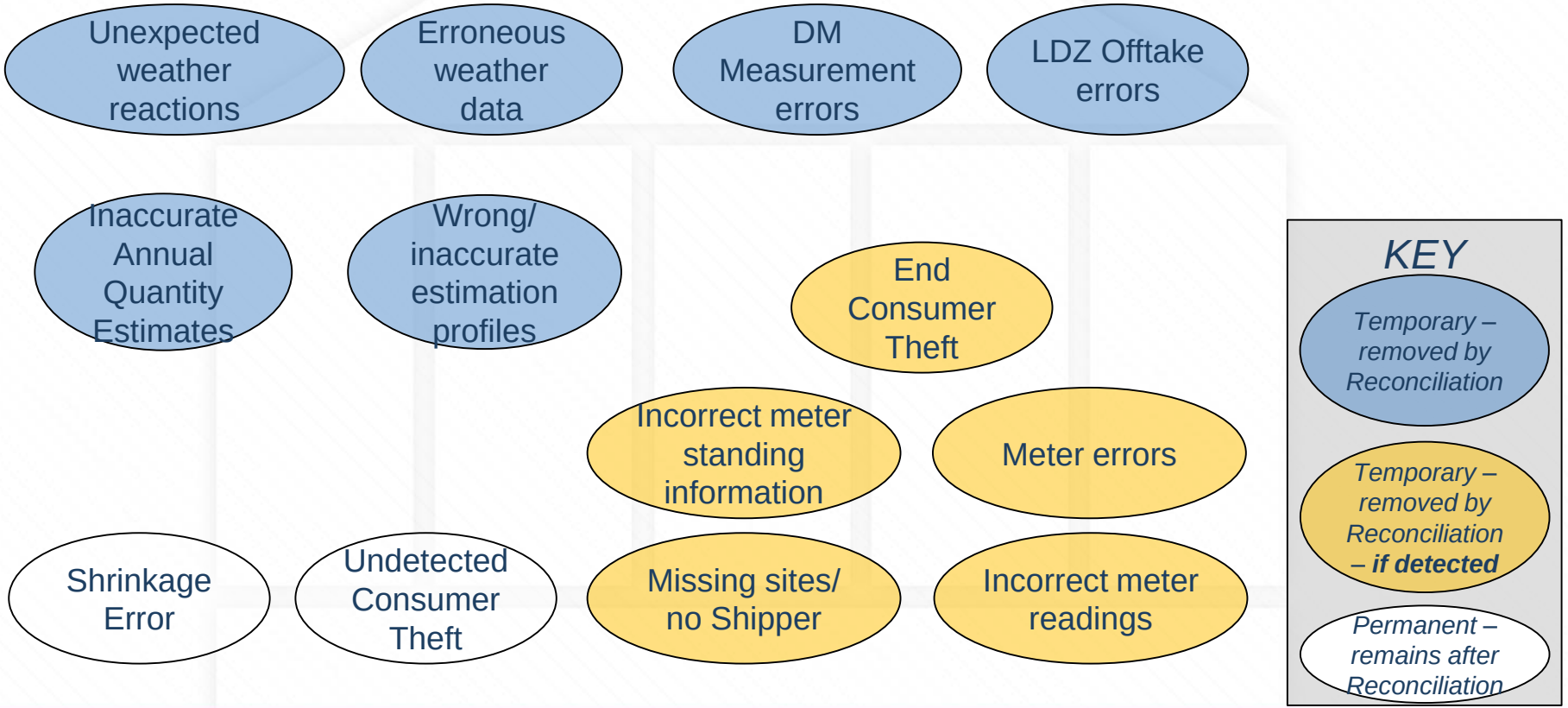
System interface issues on two days in late April caused Allocation errors at D+1, resolved prior to D+5

UIG as a % of Total Throughput – Original v Latest as at July 2019 Amendment Invoice



- Graph of national UIG after meter point reconciliations (all Classes) processed up to and including end of July 2019 (26 months)

Reminder – Some Known/Possible Causes of UIG



Key Performance Areas impacting UIG*

95% Class 1 Read Performance Obligation is 97.5%	**69%** Class 2 Read Performance Obligation is 97.5%	**78%** Class 3 Read Performance Obligation is 90%	**487k** sites unread since Nexus Go-Live	**41.66%** Of WAR eligible Annual Quantity (AQ) in Bucket Band
86% Class 4 AQ > 293k Monthly Read Performance	**77%** Class 4 Smart Monthly Read Performance	**92%** Class 4 Annual Read Performance	**29** Class 2-4 MPRNs that should be Class 1	**12,405** MPRNs with suspect Conversion Factors

* as per last UIG Task Force Executive Summary

Likely Changes to UIG Levels from October

- Levels of UIG are likely to change from 1 October 2019, due to:
  - DESC removed the uplift of Annual Load Profiles for Gas Year 2019/20 – only the Daily Adjustment Factors will be uplifted in the new Gas Year – likely to decrease NDM Allocation and increase UIG compared to current trends
  - New End User Categories from October based on Market Sector Code (Domestic/I&C) and on prepayment meter mechanism/payment type – c. 10% of the market (in EUC01/02) will be assigned to “flatter” profiles – likely to reduce NDM Allocation in winter and increase it in summer, with the opposite impact on UIG

- Sharing to EUC01 (AQ <73,201 kWh) will increase – the UIG Weighting Factors for the new Gas Year as developed by the independent Allocation of Unidentified Gas Expert will target much more UIG to Class 4 EUC01
  - Doesn’t change total levels of UIG, just the sharing proportions, increases UIG allocation to Class 4 EUC01/02 sites compared to other EUCs and Classes
  - New Weighting Factors can be seen on Joint Office AUGE pages - https://www.gasgovernance.co.uk/augenex

UNC Mods recommended by the UIG Task Force

Mod Number	Description	Status
0681S	Improve quality of conversion factor	Approved
0690S	Reduce qualifying period for Class 1	In Workgroup
0691S	CDSP to convert sites to Class 1	In Workgroup
0692S	Automatic updates to meter read frequency	In Workgroup
0693R	Treatment of kWh error due to standard CF	Review Group established
0699	Incentivise performance using additional UIG charges	In Workgroup
ModXXX	Change maximum meter read frequency to 6 months	Drafted awaiting sponsor
ModXXX	Amend must read obligation for SSPs	Drafted awaiting sponsor

Other UNC Mods which may impact UIG

Mod Number	Description	Status
0664	Transfer Class 2/3 sites with low read performance to Class 4	In Workgroup
0672	Incentivise Class 4 read performance	In Workgroup
0674	Performance Assurance Techniques and Controls	In Workgroup

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Brexit Update

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GEMINI Re-Platforming Update

Sarah Carrington & Andy Simpson

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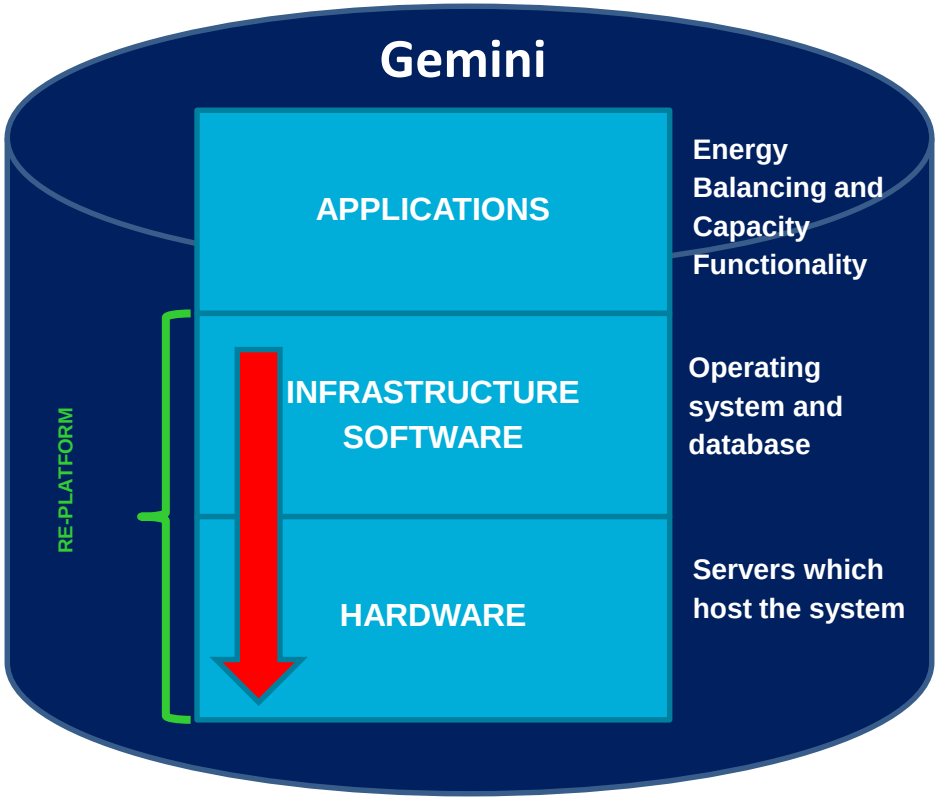
Gemini Re-Platforming Scope



In Summary - Impacts to the Industry

Functionality

- The Gemini functionality will remain exactly the same and how Industry participants interact with the system.

Extended Outage

- Extended system outage on Sunday 5th July 2020. Implementation planning will determine the optimum amount of downtime required to conduct the final cutover and incremental data migration. Finalised system outages will be communicated through the official channels.

Connectivity Testing

- All Industry participants will have the opportunity to test connectivity to the new Xoserve data centre during the period 13th April to 8th May 2020.

Access to Gemini

- Extended option to access Citrix via your web browser and/or update of your current Citrix server.

Gemini Access via Citrix

- **Citrix Server** will need to be upgraded in order to remain in vendor support
- **Citrix Receiver** software installed on individual Gemini users' desktops may become incompatible
- There are 3 potential options that are being considered:

  Option 1 – Access Gemini by upgrading Citrix Receiver

  Option 2 – Access Citrix via a web browser

  Option 3 – Combination of both of the options 1 and 2

- **Xoserve will be issuing a survey** shortly in order to gather more insight of your existing access via Citrix in order to take a decision on one of the above mentioned options to ensure minimal end user impacts.

Any queries please email: box.gasops.businessc@nationalgrid.com

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Modifications Update

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Current Modifications

Title	Status	Proposer/ Sponsor	Impacted Party*	Name	Targeted Implementation Date
Mod 0662	With Workgroup	NTS	High impact: Shippers and National Grid NTS	Revenue Recovery at Combined ASEPs	TBC
Mod 0667	Awaiting Ofgem decision	South Hook Gas Company Ltd	High impact: Shippers. Medium Impact: National Grid NTS	Inclusion and Amendment of Entry Incremental Capacity Release NPV test in UNC	No implementation specified
Mod 0670R	With Workgroup	NTS	High impact: All parties that pay NTS Transportation Charges and / or have a connection to the NTS, and National Grid NTS	Review of the charging methodology to avoid the inefficient bypass of the NTS	TBC
Mod 0678 (A-J) Urgent	Awaiting Ofgem Decision	Various proposers	High impact: All parties that pay NTS Transportation Charges and / or have a connection to the NTS, and National Grid NTS	Amendments to Gas Transmission Charging Regime	October 2020
Mod 0683	With Workgroup	Cadent	High Impact: National Grid Transmission and all GDNs.	Updating the Offtake Arrangements Document (OAD) with recommendations resulting from UNC Request Workgroup 0646R – Review of the Offtake Arrangements Document – Phase 1	NA
Mod 0686	Awaiting Ofgem decision	Vermilion Energy Ireland Limited	High impact: All Users of the GB gas transmission and distribution system and their downstream customers. National Grid in its role as the Transmission Licensee. Users currently opting for the NTS Optional Commodity Rate could expect an increase in the tariff, whilst those not using the NTS Optional Commodity Rate could expect a decrease in tariff.	Removal of the NTS Optional Commodity Rate with adequate notice	TBC
Mod 0703	With Panel	NTS	Low Impact: GB Gas Market Participants, National Grid NTS	Correction to Modification 0698S 'Improvements to Margins Notice Arrangements'	November 2019
Mod 0705	With Panel	NTS	High Impact: GB gas market participants, National Grid NTS, Ofgem	NTS Capacity Access Review	TBC

Gas System Operator

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RIIO T2

Josh Bates & Carol Carlin

nationalgrid

Stakeholders told us: Incentives in principle

Key messages..

- Broadly agree that the right areas within business are incentivised
- Stakeholders expect us to be economic and efficient.
- Support for Incentives to be symmetrical
- Delivering performance in those incentivised areas is important
- Incentives must only be for outperformance of BAU

- There should be rewards for performance in important areas but determining the level of performance and reward is very difficult.
- It is hard to know whether we are delivering beyond BAU
- Caps & collars should be subject to review but not annual
- It is hard to know what caps and collars are appropriate

- Building in more challenge: Recognition that in reducing the caps & collars we would get less money for the same performance.
- Consistent outperformance indicates the targets were wrong.
- Caps should be at the right level so as not to limit performance

Capacity Constraint Management

We are obligated to release Entry and Exit capacity at around double peak demand (top down regime). Flows of gas at these levels cannot be physically accommodated concurrently meaning there is an inherent risk to be managed as part of the regime.

RIIO-1 Incentive

- Target cost (Revenue – Costs) of £22m (in 09/10 prices) based on expected constraint costs
- Cap and Collar on incentive reward +£20m/-£60m (in 2009/10 prices)
- Encourages us to take on risk, minimise commercial actions and ensure investment decisions are balanced against risk

RIIO-2 Initial position

- Retaining the cap, collar, and target principles of the operational buy back scheme.
- Retaining the existing cost and revenue components of the scheme.
- Retaining the incremental buy back element of the scheme as-is.
- Retaining the accelerated release mechanism as-is.
- Remove a proportion of interruptible / off-peak capacity revenue where we scale back.
- Incorporating network capability outputs to inform constraint risk.

No Incentive (BAU)	Incentive (exceeding BAU)	Value for Consumers

• Less likely to release non-obligated capacity
• Tend towards more risk aversion in NGG decision making
• More likely that commercial decisions are made closer to real time and more frequent actions (more risk averse)
	• More likely to take on risk in releasing capacity over and above obligations
	• Realigning outages at cost to NGG to mitigate / manage potential constraints
	• More likely to take on risk in key investment decisions
	• Less risk averse in carrying out constraint management actions
		• Facilitates customers being able to bring gas on and off the network when and where they want, meaning the cheapest gas can be sourced with minimal disruption:
		  • Improved quality of service
		  • Lower consumer bills
		  • Improved safety and reliability

Capacity Constraint Management BAU

1 Operating the Network

- Run different compression
- Release less non-obligated capacity
- Take commercial actions earlier or later
- Less incentive to try innovative operational solutions
- Weaken contract negotiation position
- Could disproportionally impact smaller shippers by the smearing of constraint costs.

2 Constraint Management

- Socialised cost > NG act differently > Shippers know this and may act accordingly
- Ofgem decides how NG mitigate risk based on their funding of asset based solution > if NG get financed then we would likely invest to mitigate risk > if NG do not get funded then we would likely take out more contracts
- Discourages temporary build/asset solution

3 CBAs

- Involve regulator more in decision making process > only act on strong evidence that Ofgem will remunerate
- Increase stakeholder engagement > time & cost
- Additional risk factor enters into CBA
- Use commercial solutions closer to real time

4 Asset management

- Pass through to consumers increased job costs and time scales > greater uncertainty of project cost
- Reputational damage only governing factor for NG > trade this off against project costs
- Increased asset intervention if we are funded, use contracts if not funded adequately for asset investment > take less risk on asset performance

How have we performed?

Value (£m)	13/14 (£m)	14/15 (£m)	15/16 (£m)	16/17 (£m)	17/18 (£m)	18/19 (£m)
+25 to -76.4*	12.6	12.6	12.6	13.3	14.2	13.8

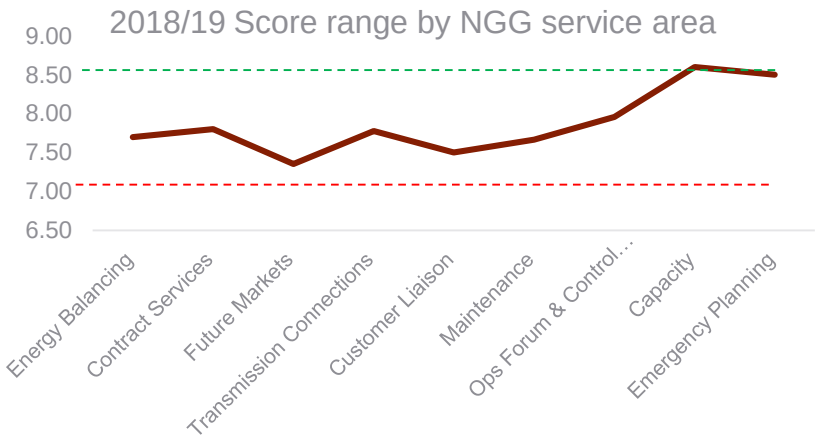
*2018/19 values including RPI.

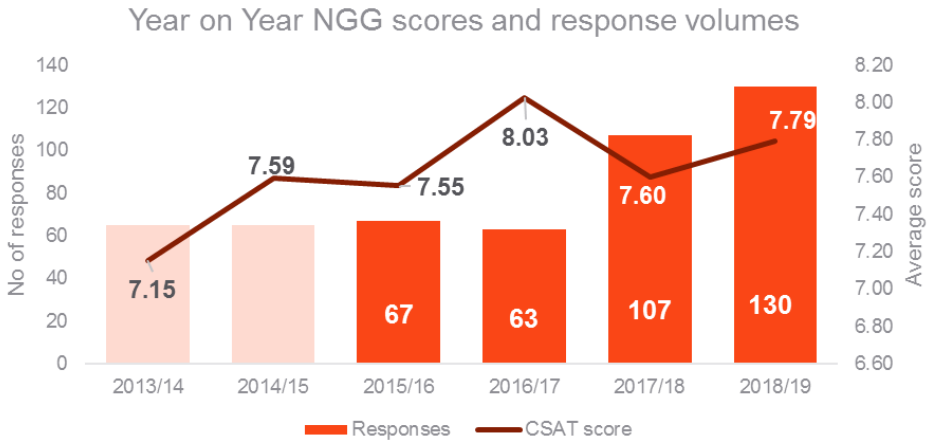
Risk analysis outputs – Combination Summary

- Demand & Supply Assumptions RIIO2
- FES, Historic, Uniform
  - Combined
- Monte Carlo
  - Intact
  - Compressor availability
  - Maintenance

		Events		
Year	Region	Avg	Max	P90
21/22	SW Entry	8	22	9
	SE Entry	2	18	3
	SO Exit	4	37	8
	Total	14	77	20
22/23	SW Entry	9	22	10
	SE Entry	1	28	4
	SO Exit	4	24	9
	Total	14	74	23
23/24	SW Entry	9	26	13
	SE Entry	3	36	5
	SO Exit	4	25	7
	Total	16	87	25
24/25	SW Entry	11	31	15
	SE Entry	3	28	6
	SO Exit	3	22	6
	Total	17	81	27
25/26	SW Entry	11	34	15
	SE Entry	4	33	6
	SO Exit	2	19	5
	Total	17	86	26

RIIO 1 Customer Satisfaction Lessons Learnt





Is your score solely based on your interactions with this service area or event?

43% of customer contacts responding take more than one NGG 'service' area into account when scoring – their average score was 7.55 last year

In contrast the remaining 57% who only experienced one NGG service area or event, scored 8.00

What we have learnt :

Improving one or two areas is not enough – We need to provide a **consistently great experience across all our touchpoints** and therefore all our NGG service areas should continue to be the focus for the Customer Satisfaction measurement.

Other RIIO2 Incentives Summary – initial view

Incentive	Purpose	RIIO1 Cap Collar	RIIO2 Initial View
Shrinkage	Minimise the energy cost of operating the network.	+£7 million to -£7 million	+£5million to -£5 million
Demand forecast	Provide accurate day ahead and D2 to D5 demand forecasts	+£20 million to -£2.5 million	+£16 million to -£2.5 million
Residual balancing	Minimise the energy cost of operating the network.	+£2 million to -£3.5 million	+£1.6 million to -£2.8 million
Maintenance	Minimise use of maintenance days and changes to scheduled maintenance.	+£0.7 million to -£1 million	+£1.2 million to -£1.5 million
GHG venting	Minimise Greenhouse Gas emissions	Zero to unlimited penalty	+£1.5 million to -£1.5 million
Potential EAP Scorecard	Maximise environmental ambition and performance	n/a	tbc

Potential Environmental Action Plan Scorecard Incentive

A potential new ODI to incentivise additional performance above and beyond our baseline commitments in our Environmental Action Plan. This is in development and we will share potential areas, metrics and targets when available.

RIIO-2 Initial position

- Still devising the areas and challenge levels
- Scorecard approach
- Should it include GHG?

Metrics below penalty threshold	Metrics above reward threshold: 0	1	2	3	4	5	6	7	8
0	£0	£0	£0.5	£1.0	£1.5	£2.0	£2.5	£2.5	£2.5
1	£0	£0	£0	£0.5	£1.0	£1.5	£2.0	£2.5	
2	-£0.5	£0	£0	£0	£0.5	£1.0	£1.5		
3	-£1.0	-£0.5	£0	£0	£0	£0.5			
4	-£1.5	-£1.0	-£0.5	£0	£0				
5	-£2.0	-£1.5	-£1.0	-£0.5					
6	-£2.5	-£2.0	-£1.5						
7	-£2.5	-£2.5							
8	-£2.5								

Example for illustration purpose only

No Incentive (BAU)	Incentive (exceeding BAU)	Value for Consumers
• Environmental considerations focussed on achieving corporate aims and compliance	• Driving performance across a number of environmental areas within the business • Investing in achieving swifter or more challenging change	• Reduced environmental impact • We've heard that air quality, carbon emissions and our role in the local community are very important for domestic consumers • This incentive will help drive progress in this area over and above our baseline

Query Surgery and Next Forum

The Next Operational Forum will take place on Thursday 21st November

Please send any requested topics to:

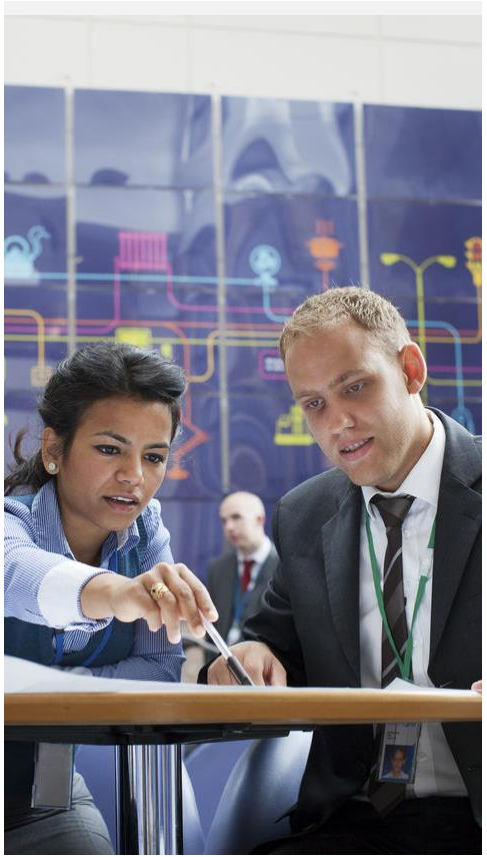
Joshua.Bates@nationalgrid.com

or

.Box.OperationalLiaison@nationalgrid.com

Opportunity now for 121 discussion with NG and Xoserve attendees

Lunch Available



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