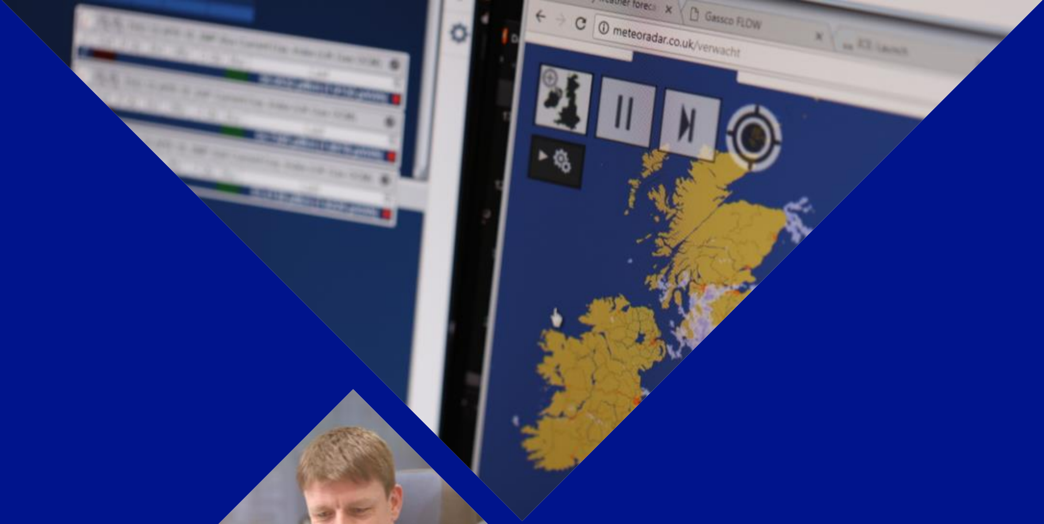
Gas System Operator

Gas Operational Forum

Radisson Grafton, London

19th September 2019



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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

Actions Since Last Forum

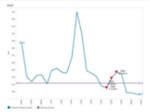
Item	Action	Detail
Day in Brief	NG to commit to provide more transparency to the industry to aid effective industry decision making.	Industry needs to advise which days you require an understanding of. We commit to providing a high level brief in 2 working days followed by further analysis is required at next Ops Forum. Please communicate with us on the discussion board on the data community site

Next Day in Brief - vote

Our Day in Brief overviews are provided to increase transparency about our commercial decisions and operations.

Below we have identified 4 separate days on which National Grid took balancing actions. Here you can see the Predicted Closing Linepack at each point during the day, along with the volume of trades, opening linepack and closing linepack. Please use the voting buttons to choose which days you would like to see a more in depth analysis on. This will be provided on the community site, as well as an overview at the next Operational Forum on the 19th September **Register Here**.

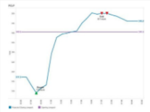
Alternatively, if there are any other days you would like us to cover, please leave us a comment on the **discussion board**.



04 August 2019

Linepack closed at 346.5mcm – loss of 0.7mcm

Yes (2) No (0)



18 June 2019

Linepack closed at 340.2mcm – loss of 0.4mcm

Yes (0) No (0)

Feedb

Agenda for Today

01	Introduction and previous actions	09:30
02	Operational Overview	09:40
03	ICE Endex	09:50
04	Operational Data Enhancements & Prevailing View Designs	10:10
05	Emergency Exercise, Changes to Margins Notice and GDW	11:00
06	Updates / Signposting	11:10
07	GEMINI Future Strategy	11:25
08	Incentives & Network Capability	11:45

Gas System Operator

02

Operational Overview

June 2019

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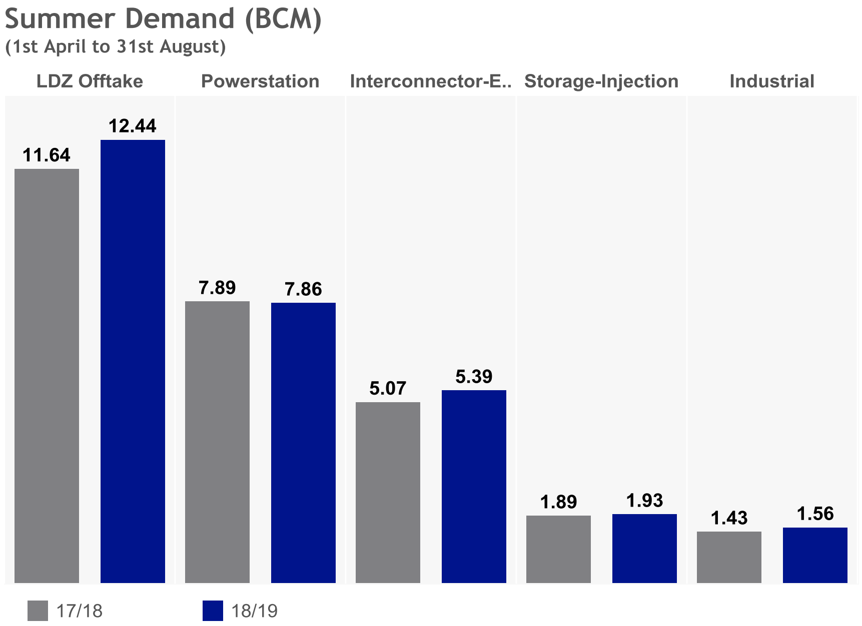
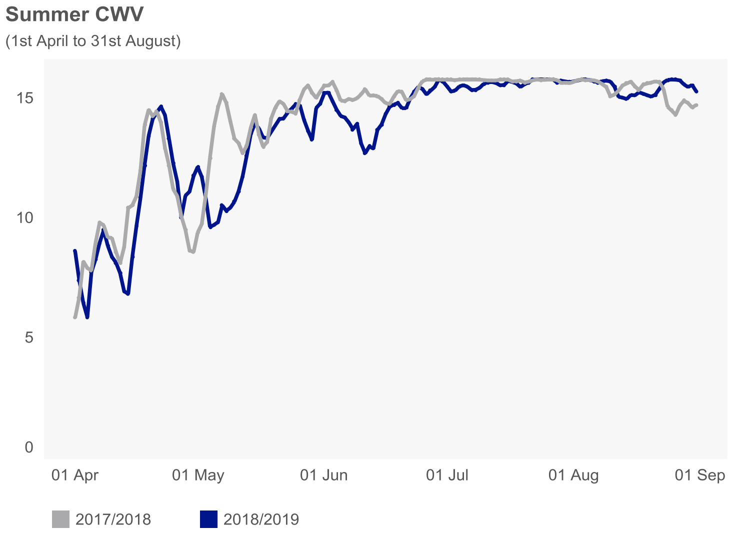
Demand – Summer 2019 vs Summer 2018

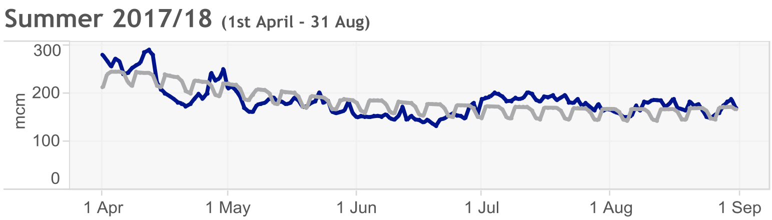
- This summer there has been a slight increase in LDZ/Domestic demand
- Interconnector Export has been slightly higher than last year, though the difference seen at the start of the summer has stayed at the same levels
- Gas fired electricity generation has been consistent with last year

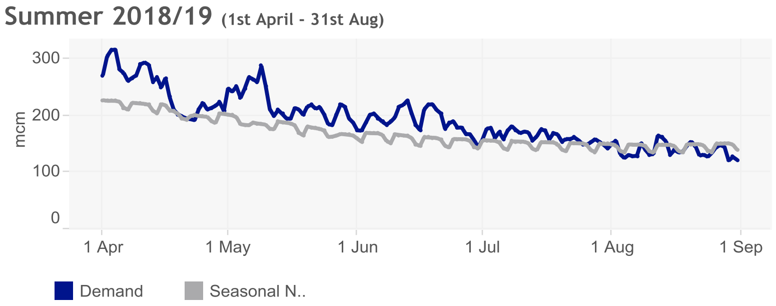


Demand – Comparison to seasonal norm

- Demand in the 1st half of summer was consistently above seasonal normal
- In the latter half of the summer this has returned to expected levels

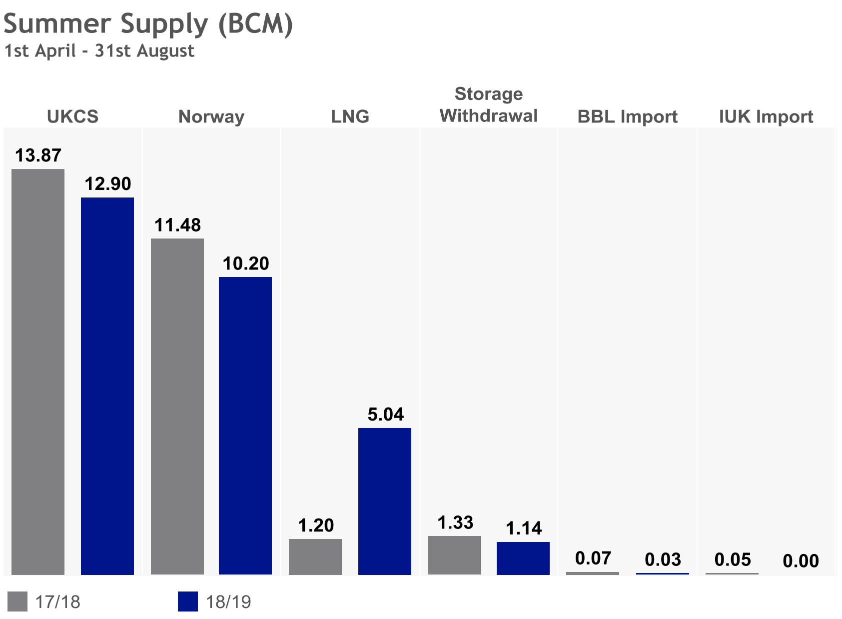


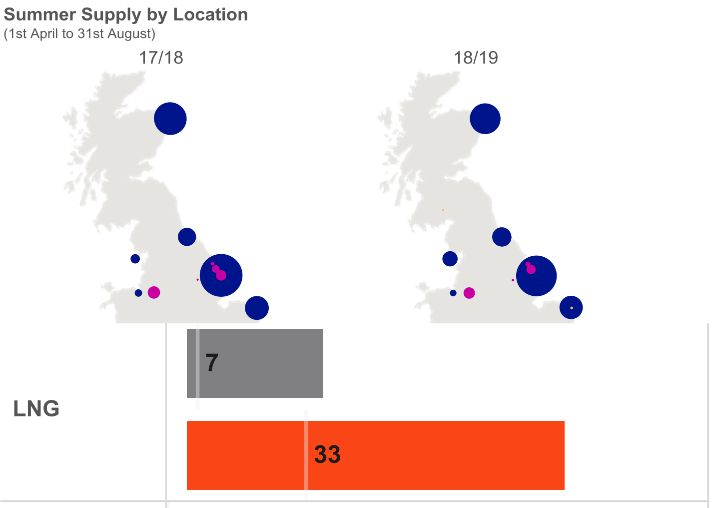


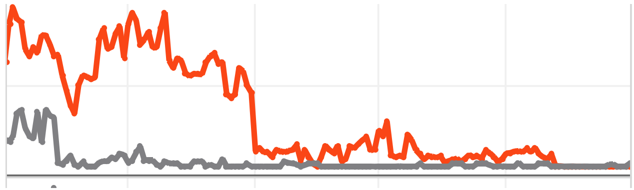


Supply – Summer 2019 vs Summer 2018

- LNG has continued to make up a larger proportion of the total supply
- Locationally the main difference has been an increased supply from Milford Haven

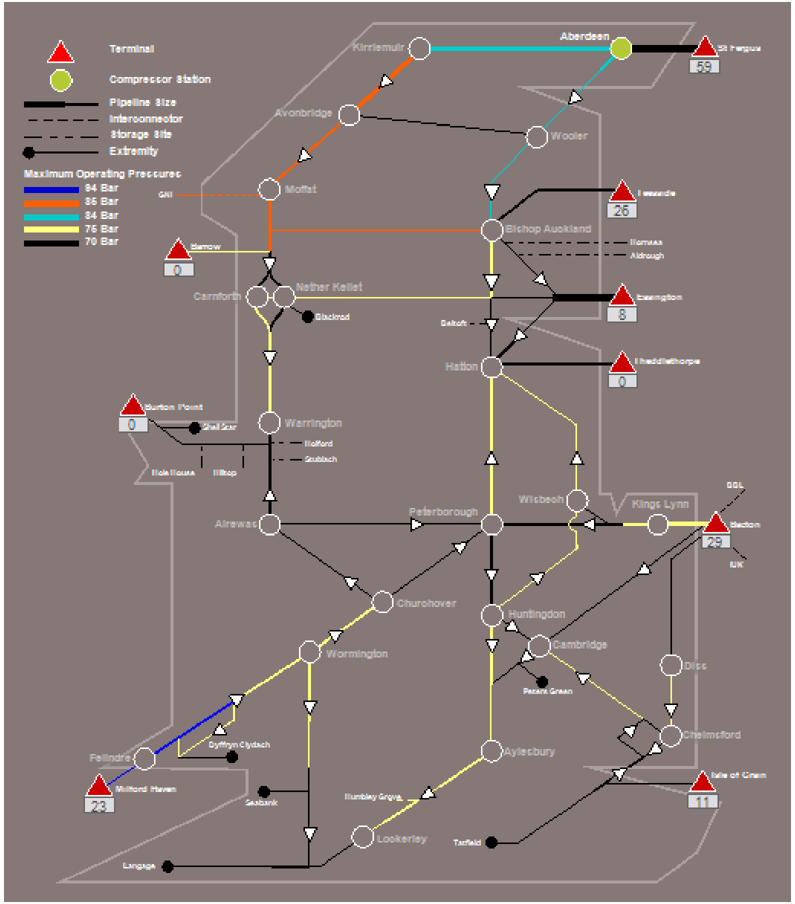






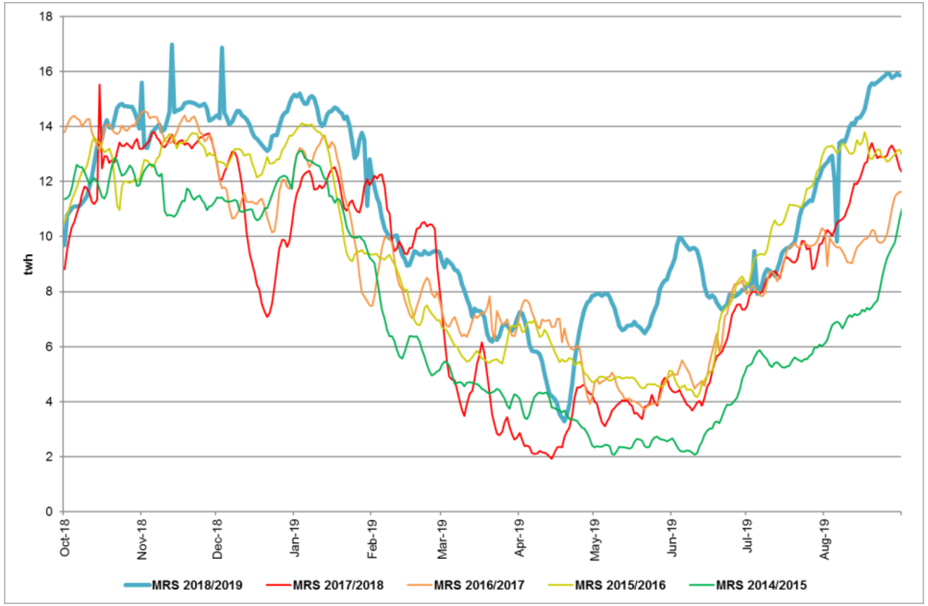
Recent Operations

- Running very little compression
- Outages at Langeled and Barrow
- LNG has started to pick up again after lower flows in the latter half of the summer to meet the reduction in supply
- End of maintenance season, so have the majority of assets available



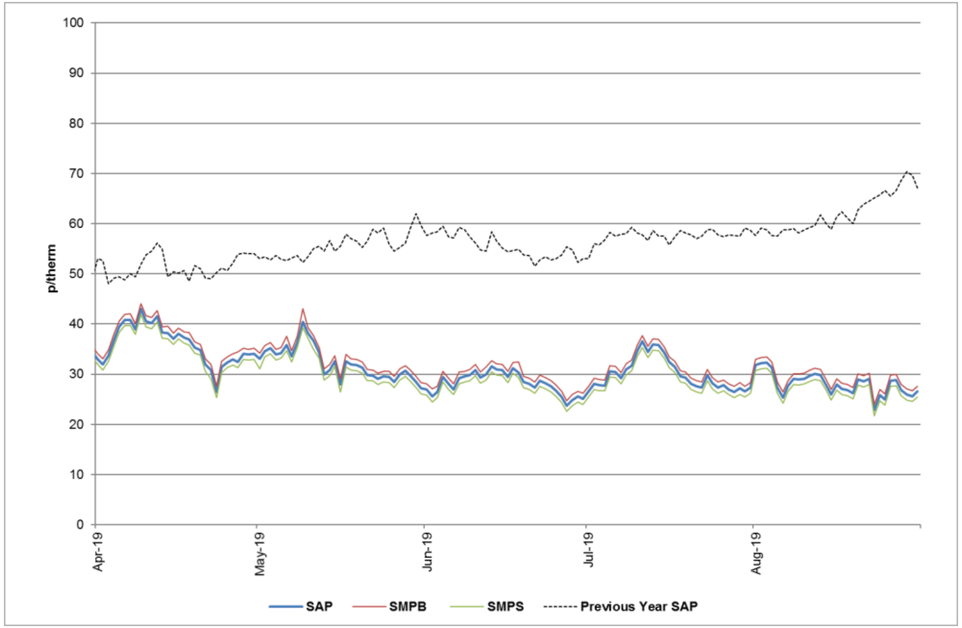
Recent Operations

- Storage Stock Levels are at the highest they have been for the last 5 years
- Storage stocks were higher than usual at the start of the summer after a relatively mild winter
- Summer saw higher injection and lower withdrawal than last year



Recent Operations

- Surplus of supply over the summer, and higher storage stock levels have led to the lowest SAP prices we have seen over the last 10 years on the 4th September
- National Grid also traded on the gas day at midnight – selling 1.3mcm
- Price dropped to 19p



ICE OCM Commercial Update

National Grid Operations Forum

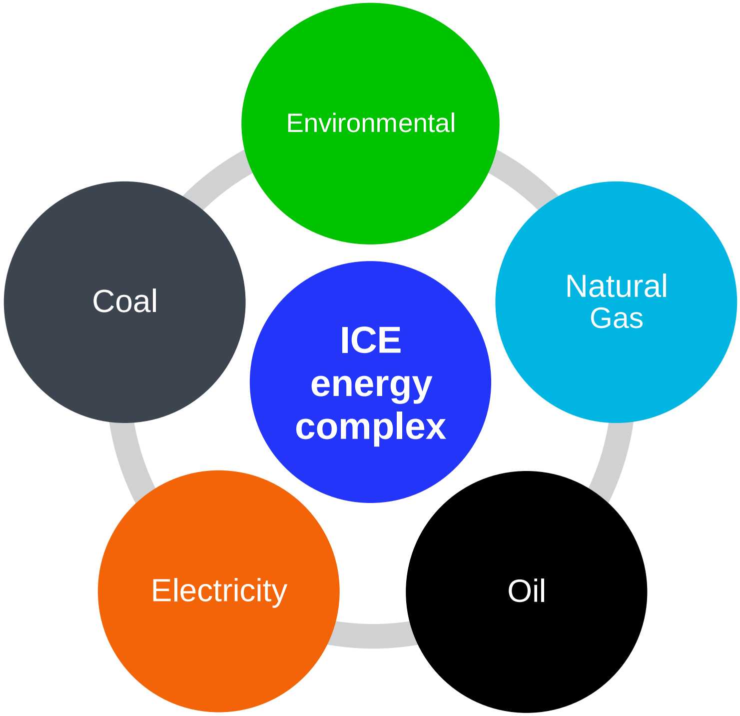
Wouter de Klein

Commercial Director ICE Endex

London, 19 September 2019

ICE Energy complex

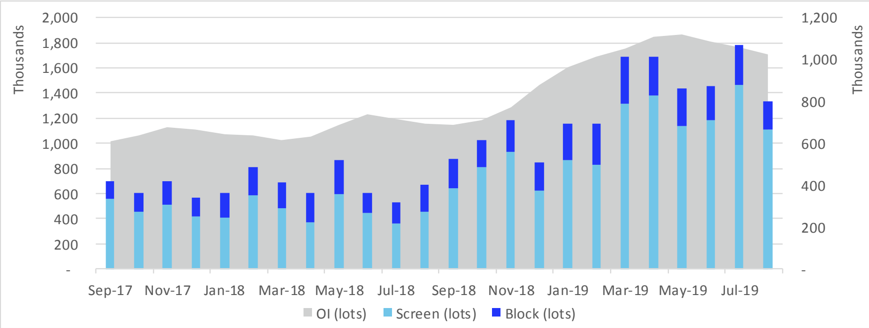
Environmental	Natural Gas	LNG	Oil	Electricity	Coal
EUA	TTF	JKM	Brent	German Power	API2
EUAA	NBP	NBP 1st Line	Dubai	Nordic Power	gC Newcastle
CER	Henry Hub	TTF 1st Line	Gasoil	UK Power	API4
CCA	PSV	GCM	Fuel oil	French Power	gC Richards Bay
RGGI	VTP		Permian WTI	Italian Power	M42
RECs	NCG		WTI	Spanish Power	gC Indonesian
LCFS	Gaspool			Dutch Power	Indo Sub-Bit
RINs	ZTP			Belgian Power	API8



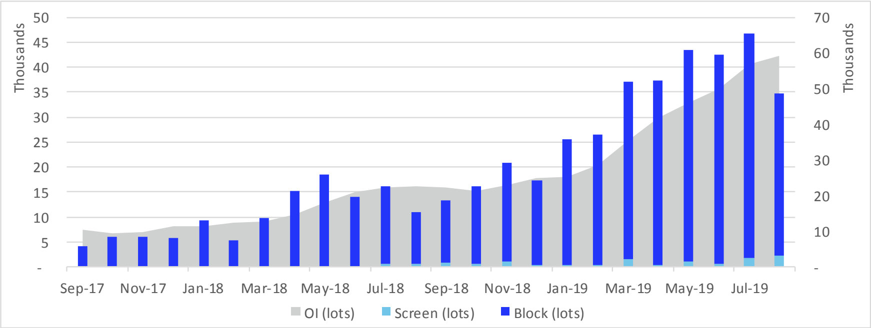
ICE Global Natural Gas & LNG

- Growth in TTF and JKM continues on from 2018
  - TTF Futures volumes up 117% YTD vs. LYTD; traded more than 1,000 TWh per month for 5 consecutive months
  - Various screen and O.I. records for JKM Futures YTD
- Wide range of time- and locational spread contracts available across EU Gas hubs
- Global Gas portfolio with Henry Hub, TTF, NBP and JKM and inter-product spreads available to trade
- New Gas products gradually added during the year

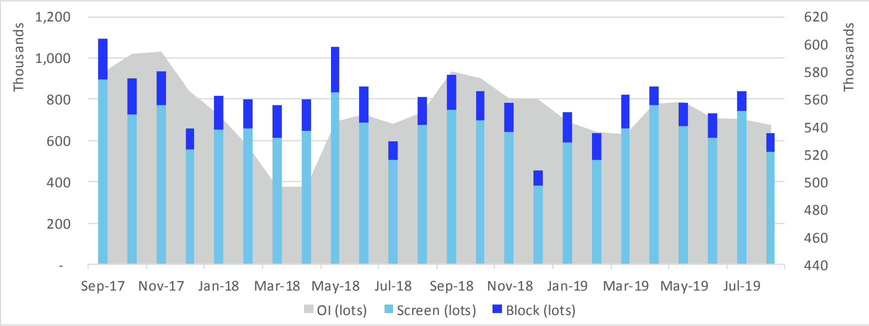
ICE TTF Futures



ICE JKM (Platts) Futures

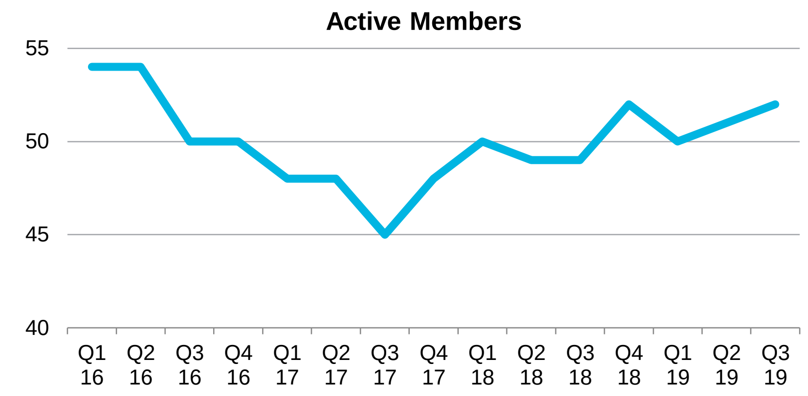


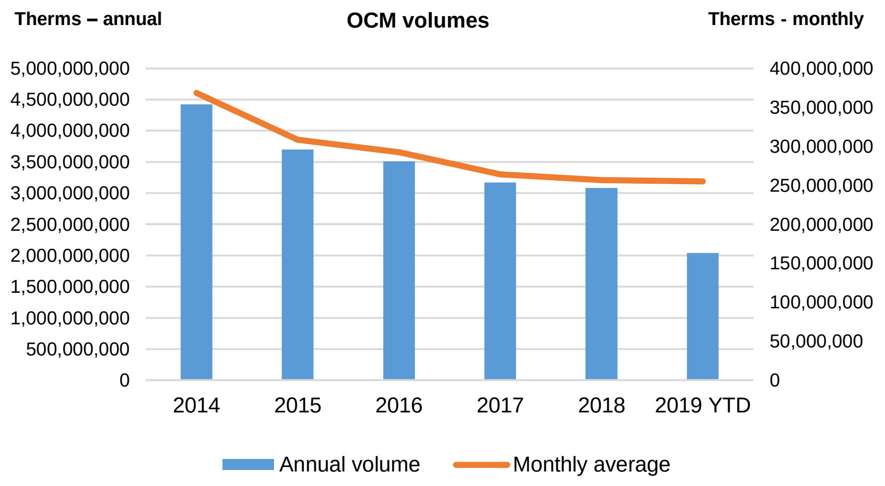
ICE NBP Futures



OCM - Key commercial developments

- YTD 2019 54 trading participants (LYTD 55)
- 787 individual (trader) user IDs with access to the OCM; 378 individual users actually traded year-to-date
- 63 members; 3 membership applications in progress; 5 new memberships in 2018
- Traded volume down 9% YTD vs. LYTD





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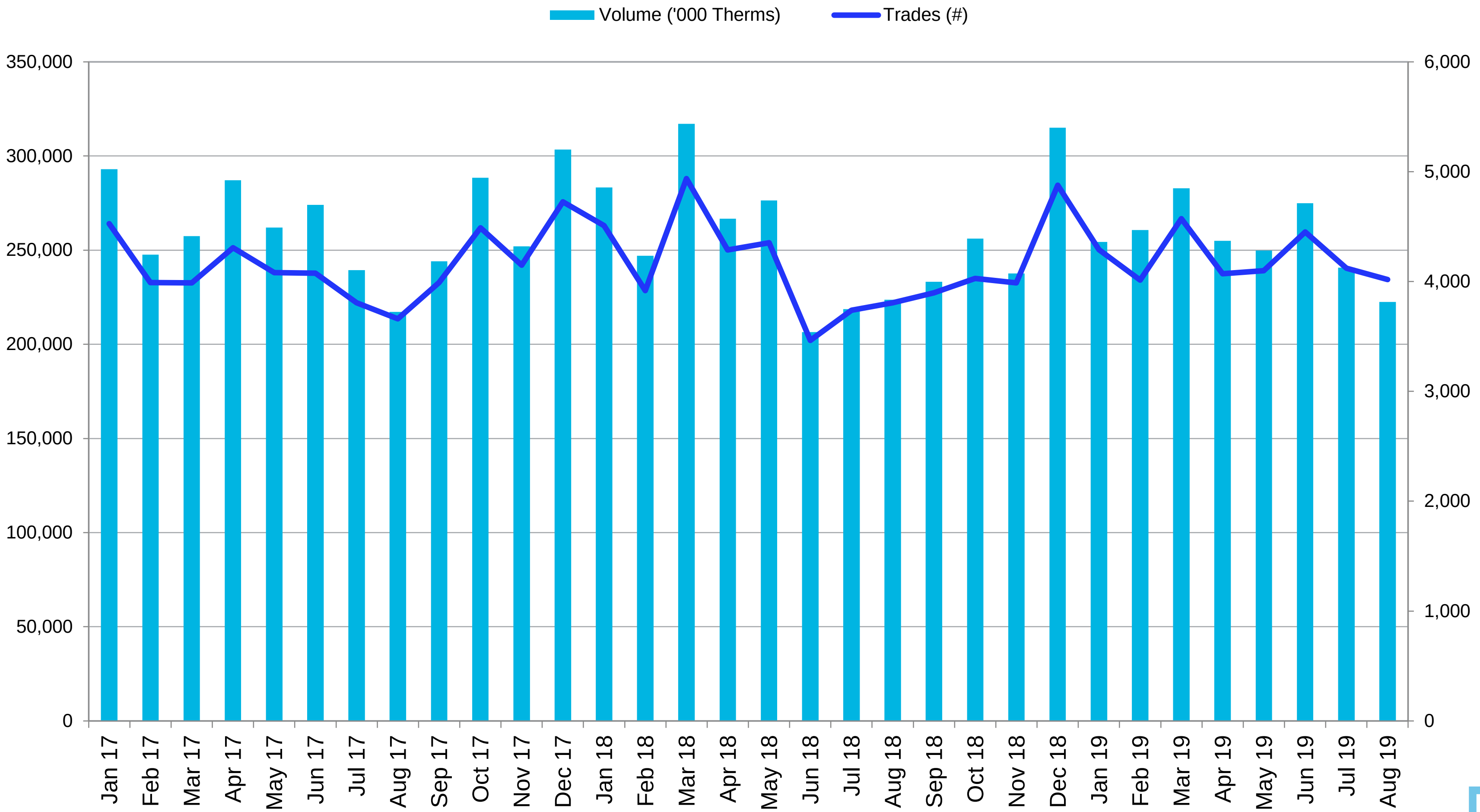
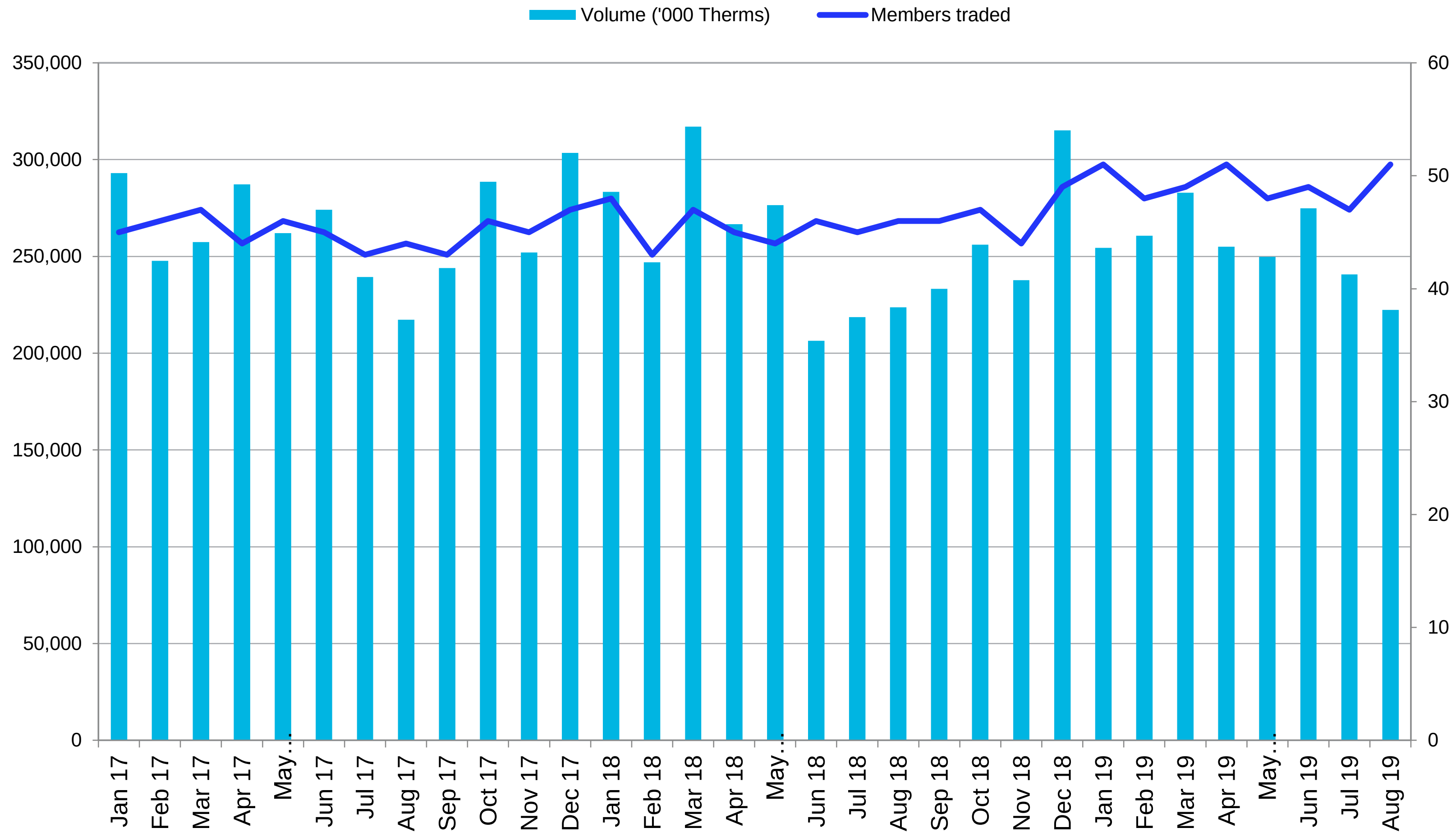
Volumes and trades per month

Past 24 months



Volumes and active members

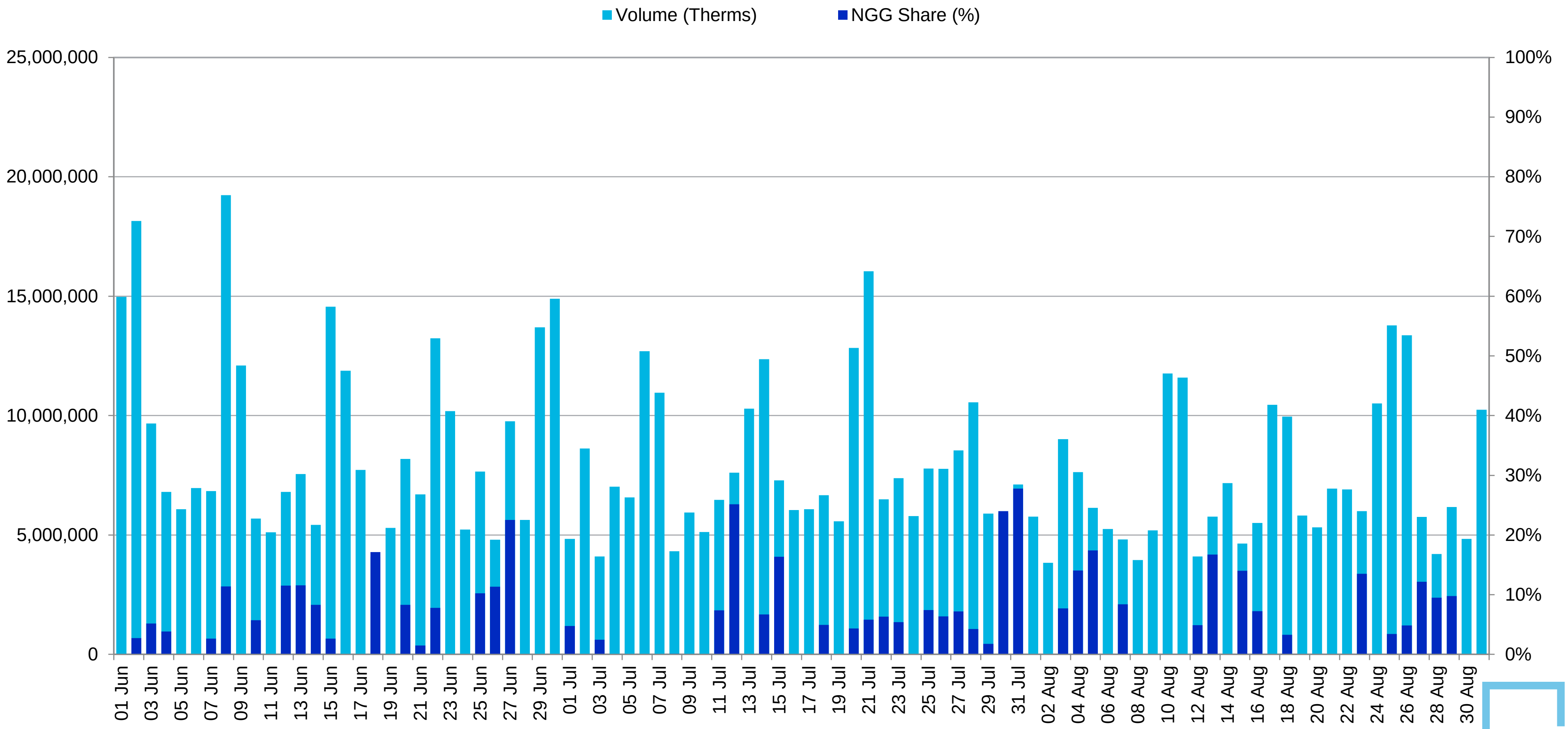
Past 24 months



Volume and NGG share per day

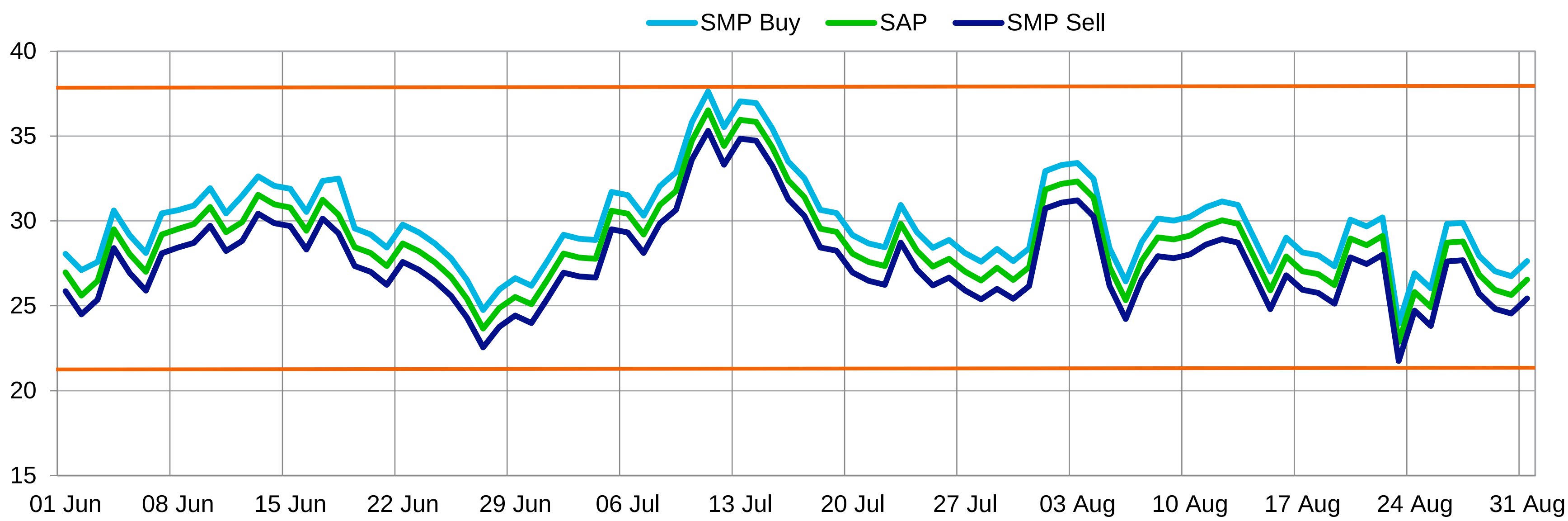
Last 3 months

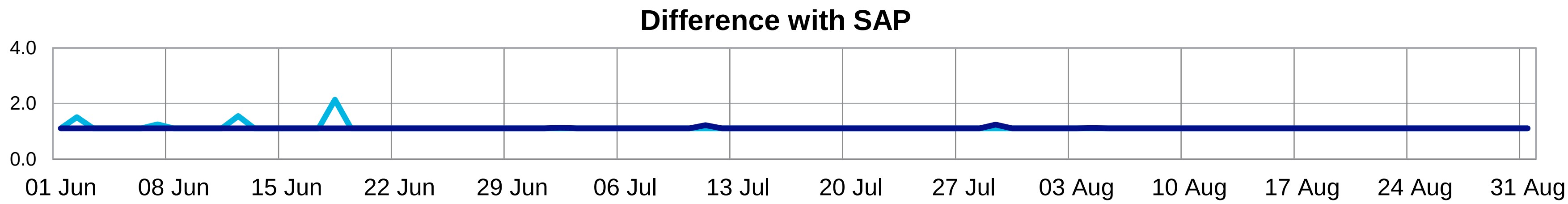
	HIGHEST	LOWEST	AVERAGE
Volume	19,233,000 (08 Jun)	3,834,000 (02 Aug)	8,022,000
NGG Share	27.8% (31 Jul)		5.0%



SAP / SMP prices

Past 3 months





Any other business

- Full Trayport integration available for the OCM as well as many other markets in the IFEU and NDEX Commodities portfolio

Fees

p/therm	Trading	Clearing	Total
Within Hours (Mon-Fri 08:00-18:00)	0.001	0.002	0.003
Out of Hours (Mon-Fri 18:00-08:00, Sat, Sun	0.003	0.006	0.009
Membership Fee: £15,000 per annum			

www.theice.com/fees

Thank you

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04

Operational Data Enhancements

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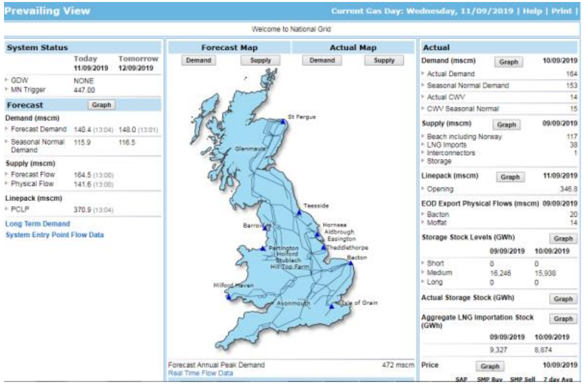
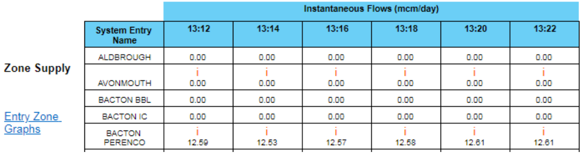
Introduction to MIPI

- MIPI stands for Market Information Provision Initiative
- We provide Operational Data on our website to reduce market uncertainty, and increase transparency.
- Operational Data pages get around 65 million hits per month
- Data can be accessed through web pages or ‘pulled’ via API
- Separate ‘Data Tier’ – physical data centre and ‘Web Tier’ - cloud

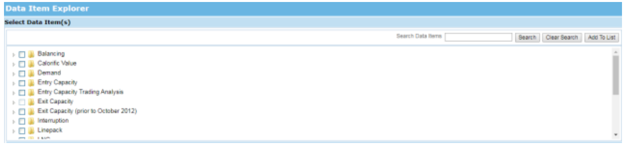




Zone Supply

Entry Zone Graphs

System Entry Name	Instantaneous Flows (mcm/day) 13:12	13:14	13:16	13:18	13:20	13:22
ALDBROUGH	0.00	0.00	0.00	0.00	0.00	0.00
AVONMOUTH	0.00	0.00	0.00	0.00	0.00	0.00
BACTON BBL	0.00	0.00	0.00	0.00	0.00	0.00
BACTON IC	0.00	0.00	0.00	0.00	0.00	0.00
BACTON PERENCO	12.59	12.53	12.57	12.58	12.61	12.61



Need for Change

- Data tier is old, and costly to make changes to
- Reliability of data items to agreed timings could be improved
- The industry require more data and transparency to aid decision making and create efficiencies and savings for end consumers.
- Net zero pathway and decentralisation will require a platform that can facilitate more data/one version of the truth – this new platform could facilitate this going forward.
- Looks dated!

Changes already delivered include hourly trading data, instantaneous demand at category level, and performance reporting.

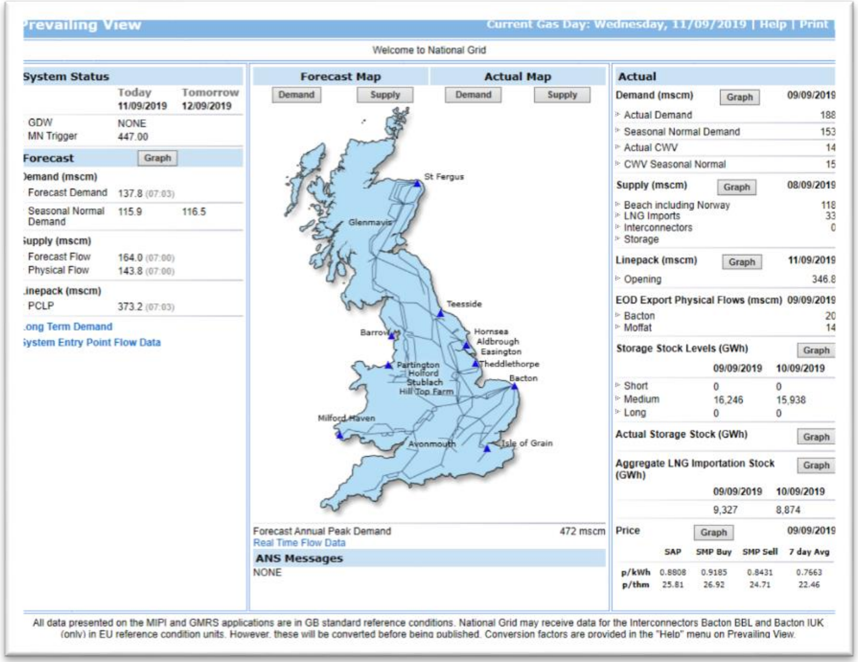
We will be creating a new data tier, updating the web tier, and creating a new prevailing view (daily snapshot)

Engagement with Industry

- Operational Forums
- Data Workshops
- 1-1 Meetings
- Data Community site

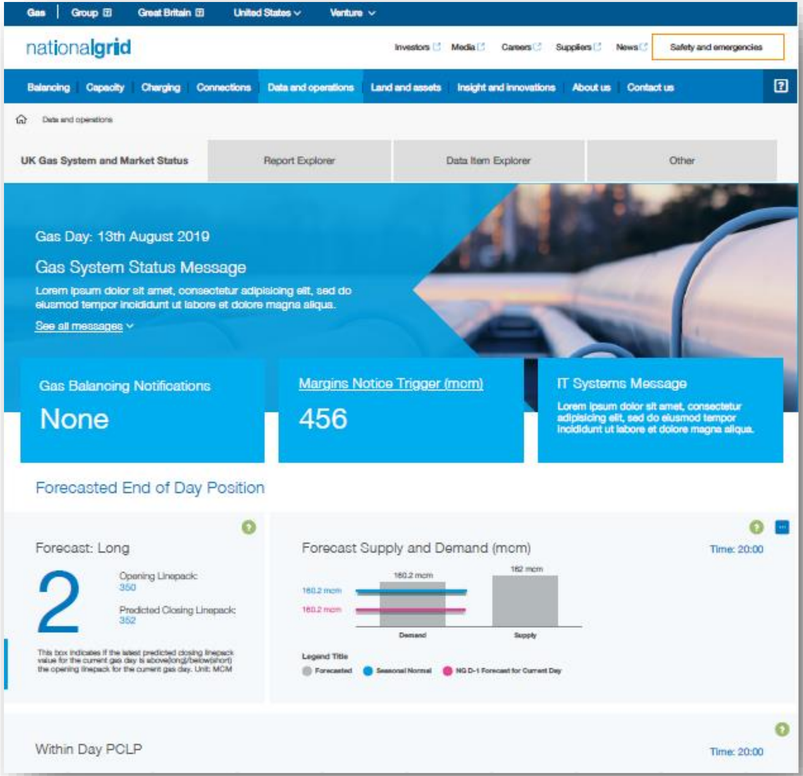
Prevailing View Today

- Current prevailing view is outdated
- Not all information is relevant or well organised
- Requires prior knowledge to understand data
- Current view does not provide a simple ‘snapshot’ for the gas day.

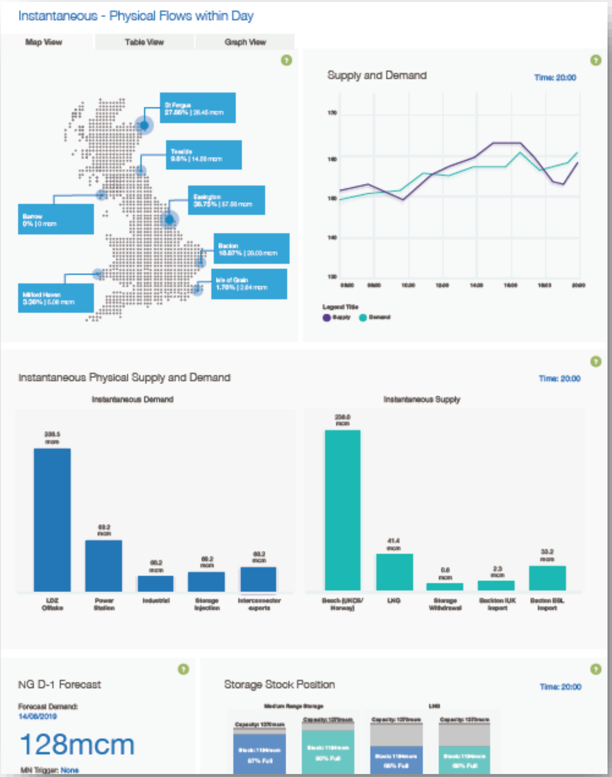


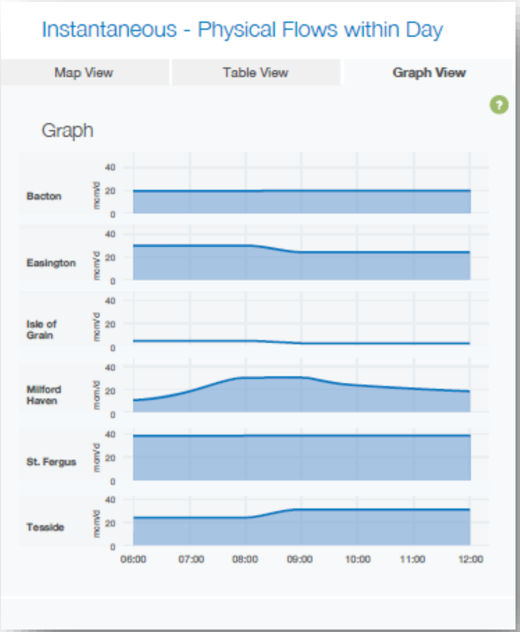
Prevailing View – New designs

- Modern look and feel with a more intuitive user interface
- Improved visualisation
- Clear explanation and context of data
- Relevant information for current gas day



Prevailing View – New designs





Prevailing View – Next Steps

1. **Customer Engagement and Feedback**
    - Data Community Site
    - Gas Ops Forum
    - Working Groups

2. **Build and Launch (agile delivery of industry enhancements from 2019 onwards)**

Gas System Operator

05

Emergency Exercise, Changes to Margins Notice and GDW

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Exercise Arctic

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Aim and objectives

Aim:

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

This will be demonstrated by effective two way communications processes across the industry and its stakeholders; timely and accurate information being shared between participants; and effective emergency strategies being produced and implemented

Aim and objectives

Objectives:

- Test the upstream management procedure, web portal and emergency response communications
- Practice the response link between localised transmission and national supply emergencies
- Validate emergency procedures, specifically E1, National Grid’s E3, the E3 documents of the Distribution Networks and the NEC Safety Case
- Embed, for testing, recommendations from previous industry emergency exercises, including Exercise ‘Zeus’ (2018) Restoration Exercise ‘Alpha’ (2019) and Communications Exercise ‘Announce’ (2019)

Participants – 2nd and 3rd Oct 2019

Government and Regulators

- Department for Business Energy and Industrial Strategy (BEIS)
- Oil and Gas Authority (OGA)
- Health and Safety Executive (HSE) *[Observing]*
- Office of Gas and Electricity Markets (Ofgem) *[Observing]*

Network Emergency Coordinator (NEC)

National Grid

- Crisis Management Team (CMT)
- **Network Emergency Management Team (NEMT)**
- Corporate Affairs Response Team (CART)
- Gas Transmission (GT) Silver Command
- Electricity National Control Centre (ENCC)

National Transmission System – Directly Connected Sites

Terminal Operators and LNG Importation Terminals

TERMINALS:	
Easington - Gassco, Langeled	St. Fergus - Ancala (Wood), SAGE
Easington - Centrica Storage, Rough	St. Fergus - NSMP (PX)
Easington - Perenco, Dimlington	St. Fergus - Shell
Burton Point - ENI	St. Fergus - National Grid
Bacton - Shell, BBL	Teesside - Antin (Wood), CATS
Bacton - National Grid	Teesside - PX
Bacton - SEAL	Barrow - Spirit Energy

LNG TERMINALS:

- Milford Haven – South Hook
- Milford Haven – Dragon
- Isle of Grain – National Grid

Storage Facilities

- Aldbrough – Equinor/ SSE Gas Storage
- Hatfield Moor – Scottish Power
- Hilltop – EDF Energy
- Hole House – EDF Energy
- Holford – UniPer
- Hornsea – SSE Gas Storage
- Humbly Grove – Humbly Grove Energy
- Stublach - Storengy

Shippers

Gas Distribution Network Operators

- Cadent
- Northern Gas Networks (NGN)
- SGN
- Wales and West Utilities (WWU)

Interconnectors

- BBL – BBL Company
- Irish interconnector – Gas Networks Ireland (GNI)
- I(UK) – Interconnector (UK)

Further info and Feedback

An industry briefing note is available at:

https://www.nationalgridgas.com/safety-and-emergencies/network-gas-supply-emergencies-ngse

Exercise Control is available on:

01926 656948

Exercise feedback can be provided to:

Gasops.emergencyplanning@nationalgrid.com

Gas System Operator

Margins Notice & GDW

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Gas Deficit Warning Name Change

The term ‘Gas Deficit Warning (GDW)’ has changed to ‘Gas Balancing Notification (GBN)’

The GDW issued on 1st March 2018 successfully stimulated a market response to a material supply / demand imbalance; it also caused some confusion in the market and in media reporting

- A GDW does not necessarily mean that there is insufficient gas available nor that the declaration of an emergency is imminent
- It is an announcement to the market that more gas needs to be provided or demand curtailed in order to restore the within-day supply / demand balance

The new name provides a more accurate term to describe this market message

We are currently updating our procedures and relevant MIPI / website pages to reflect this change

Market participants will need to update any contracts where the GDW term also appears

Changes to Margins Notice Arrangements

NG may issue a Margins Notice when forecast demand is greater than or equal to expected available supply for the next gas day

We have reviewed the calculation and notification arrangements with the industry and are making the following changes for this winter:

1) **We will issue an ANS message when D-1 forecast demand exceeds 95% of expected available supply**

2) **Introduce a new method for determining the LNG contribution to expected available supply**

   - Daily capability based on historical LNG inputs and an assumed quantity of usable LNG stock
   - Expected to reduce assumed LNG capability from what we have used in the past, thereby increasing the potential for Margins Notices to be issued

3) **Limit the use of Margins Notices to the winter period (1 Oct to 31 Mar) with discretion to extend into April**

Further Information

You can find a Q&A document and video which provides further explanation of these changes on our Gas Operational Data Community website at [ ]

- This link was also emailed to the industry on [16th September]

Full details of the UNC Workgroup discussions and Modifications can be viewed at:

- **http://www.gasgovernance.co.uk/0669**
- **http://www.gasgovernance.co.uk/0685**
- **http://www.gasgovernance.co.uk/0698**

For any further queries, please contact philip.hobbins@nationalgrid.com

Gas System Operator

06

Updates
Data Centre Programme
Gas Regulatory Change Update

nationalgrid

Data Centre Programme - System Outage

Please be aware that we are making some essential changes to our Data Centre. This means that we will need to take a system outage to an upstream system that provides data to our Operational pages.

This will take place on During November (Date TBC).

Impacts will be seen through both the data displayed on the Prevailing View page and within Data Item Explorer.

During the outage, opening line pack, demand & PCLP data will be made available utilising Active Notification Service (ANS). This data will also be available on the bottom of the Prevailing View screen.

All missed data items will be populated into the system retrospectively. We expect the outage to commence after 16:00 PCLP publication on the day and to last approximately 6 hours.

We are working with our colleagues in the Distribution Networks to manage any impacts.

To clarify, this will affect the following data within Prevailing view:

- **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

GB EU Charging Project Update

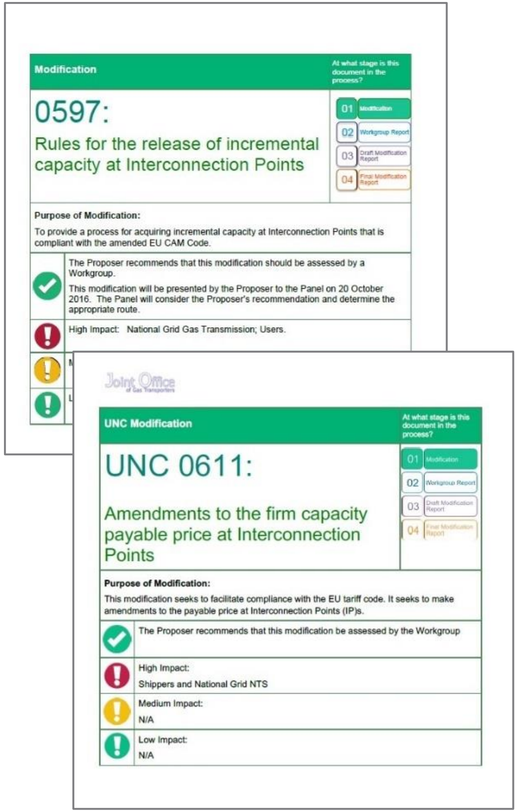
- Implementation on 8th September included updates to Gemini and MIPI

- The scope included:

  - **Mod 0597: Rules for the release of incremental capacity at Interconnection Points**

  - **Mod 0611: Amendments to the firm capacity payable price at Interconnection Points**

- Gemini and related downstream systems have to be compliant with the Interconnector Point (IP) Planning and Advanced Reservation of Capacity Agreement (PARCA) process. In the event that a customer wishes to book incremental capacity at IP; Gemini can now accommodate bookings for IP PARCA Capacity at Moffat and Bacton.


Modification

At what stage is this document in the process?

01 Modification
02 Workgroup Report
03 Draft Modification Report
04 Final Modification Report

0597:

Rules for the release of incremental capacity at Interconnection Points

Purpose of Modification:

To provide a process for acquiring incremental capacity at Interconnection Points that is compliant with the amended EU CAM Code.

The Proposer recommends that this modification should be assessed by a Workgroup.

This modification will be presented by the Proposer to the Panel on 20 October 2016. The Panel will consider the Proposer's recommendation and determine the appropriate route.

High Impact: National Grid Gas Transmission; Users.

Joint Office of Gas Transporters

UNC Modification

At what stage is this document in the process?

01 Modification
02 Workgroup Report
03 Draft Modification Report
04 Final Modification Report

UNC 0611:

Amendments to the firm capacity payable price at Interconnection Points

Purpose of Modification:

This modification seeks to facilitate compliance with the EU tariff code. It seeks to make amendments to the payable price at Interconnection Points (IP)s.

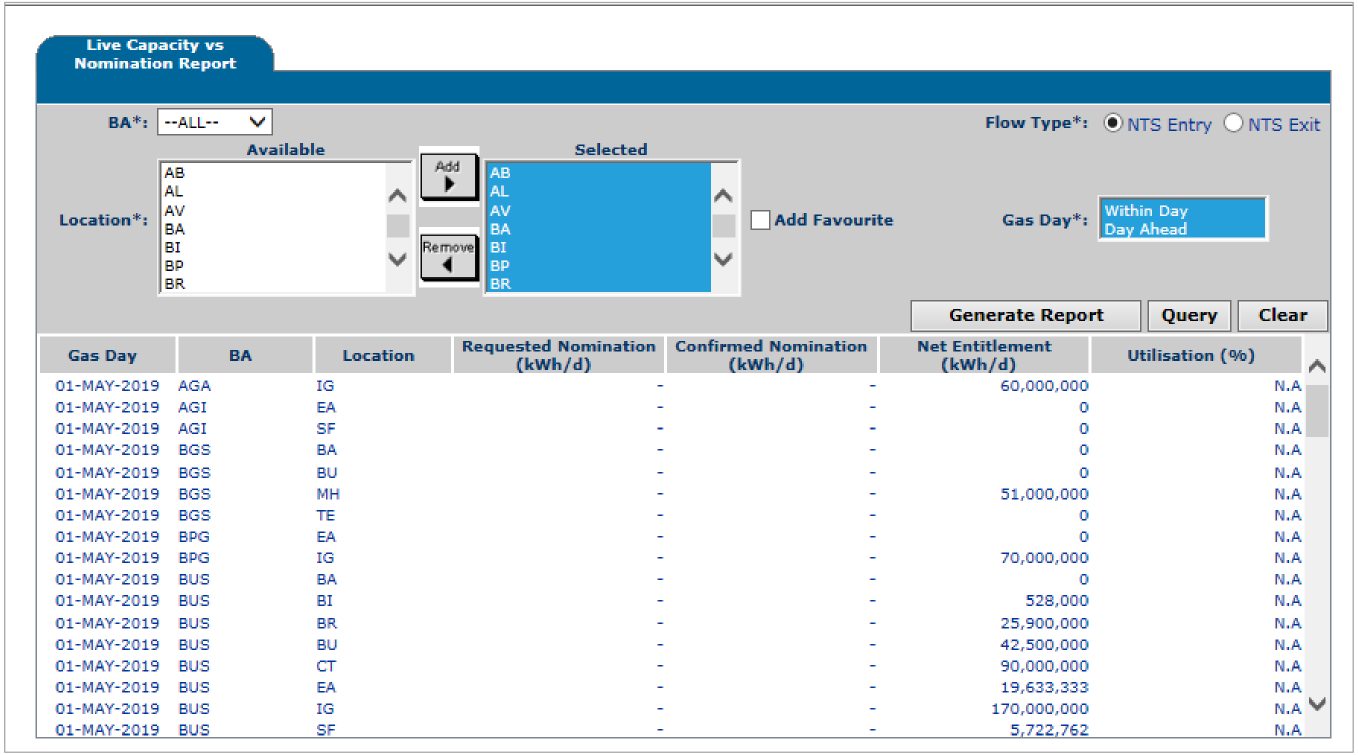
The Proposer recommends that this modification be assessed by the Workgroup

High Impact:
Shippers and National Grid NTS

Medium Impact:
N/A

Low Impact:
N/A

GB EU Charging Project Update
Live Capacity vs Nominations Report



Gas Day	BA	Location	Requested Nomination (kWh/d)	Confirmed Nomination (kWh/d)	Net Entitlement (kWh/d)	Utilisation (%)
01-MAY-2019	AGA	IG	-	-	60,000,000	N.A
01-MAY-2019	AGI	EA	-	-	0	N.A
01-MAY-2019	AGI	SF	-	-	0	N.A
01-MAY-2019	BGS	BA	-	-	0	N.A
01-MAY-2019	BGS	BU	-	-	0	N.A
01-MAY-2019	BGS	MH	-	-	51,000,000	N.A
01-MAY-2019	BGS	TE	-	-	0	N.A
01-MAY-2019	BPG	EA	-	-	0	N.A
01-MAY-2019	BPG	IG	-	-	70,000,000	N.A
01-MAY-2019	BUS	BA	-	-	0	N.A
01-MAY-2019	BUS	BI	-	-	528,000	N.A
01-MAY-2019	BUS	BR	-	-	25,900,000	N.A
01-MAY-2019	BUS	BU	-	-	42,500,000	N.A
01-MAY-2019	BUS	CT	-	-	90,000,000	N.A
01-MAY-2019	BUS	EA	-	-	19,633,333	N.A
01-MAY-2019	BUS	IG	-	-	170,000,000	N.A
01-MAY-2019	BUS	SF	-	-	5,722,762	N.A

Gemini Re-Platforming Project Update

- Replacing ageing infrastructure
- Gemini to be moved to new cloud based solution
- Existing Gemini functionality will be replicated in the Re-Platformed design
- No direct impact to Gemini users
- Implementation planned for July 2020

Gas System Operator

07

GEMINI Strategy

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Recap

Ongoing

Ongoing improvements implemented according to customer feedback (e.g. helpdesk improvements, ongoing maintenance etc.)

November 2017

RIIO1 Strategy – re-platform or replace?

Started discussion on "pain points"

February 2018

Change proposal raised in December 2017 and continuing work to mobilise the re-platform.

Confirm pain points, provided a view on which were resolvable, requested further information

Launched the RIIO2 Gemini strategy work

March 2018

Launched Survey Monkey to understand more information on "pain points"

Launched Survey Monkey to understand feedback on services.

June 2018

Gemini workshop focussing on prioritisation of "pain points" and understand requirements for future Gemini system

March 2019

Capacity vs nominations report published

…to date

Understanding requirements and how implement. Built into T2 business plans. Ensured ones we could deliver ongoing

Context

Requirements of the Gemini system in RIIO2:

- **Robust**
  - the Gemini system needs to be supportable into the future. The current Gemini system will become unsupported in 2025 when the extension of vendor supported life achieved through the re-platform carried out in RIIO1, will come to an end. At that time, the current system will be 20 years old.
- **Enables Change**
  - be adaptable to future industry change. Our ability to update our IT systems and services to adapt to the changing energy landscape and deliver industry driven regulatory change is critical in delivering what stakeholders require
- **Responsive**
  - agile to respond to stakeholder requirements and action their feedback for functional and non-functional enhancements.
- **Value for Money**
  - delivers a robust system which enables change and is responsive to stakeholder requirements in an economic manner which is efficient for end consumers.

Options under consideration

To maintain supportability and deliver on stakeholder requirements, we have analysed five options. These options build in terms of the level of intervention and costs. The options considered are;

1. **Sustain**
2. **Hosting Modernity**
3. **Enhanced Solution**
4. **Re-write application using Commercial off-the-Shelf (COTs) products, where appropriate**
5. **Re-write with bespoke application**

Options analysis – Benefit Drivers

Options	Sustain	Hosting Modernity	Enhanced Solution	Re-write with COTS	Bespoke Application
Implementation Costs	£13.6m	£19.6m	£24m	£25m	£37m
Service & Performance Risk	Highest	Highest	Lowest	Medium	Lowest
Change Delivery Ease/Cost	Highest	Highest	Lowest	Medium	Medium
User Experience / interface	Least	Least	Medium	Medium	Best
Customer Impact	Lowest	Lowest	Highest	Highest	Highest
Subsequent Operating Cost	Highest	Medium	Lowest	Medium	Highest

Option 3: Enhanced Solution

Believe the Enhanced Solution option meets the requirements of the Gemini system in RIIO2:

- **Robust**
  - all options considered will secure the continued support of the Gemini system for the RIIO2 period as a minimum.
  - service and performance risks reduced to the lowest compared to other options.
- **Enables Change**
  - change can be delivered easily and more cost efficiently compared to other options, particularly compared to the other Maintain options (Sustain and Hosting Modernity).
- **Responsive**
  - respond to stakeholder feedback and deliver the enhancements required by industry.
  - responsiveness will be limited to the capability of the existing system but that doesn’t prevent the delivery of any enhancements identified.
  - high impact on customers is inevitable but will be minimised as far as possible
- **Value for Money**
  - no foreseen triggers to warrant a re-write of the system meaning this option represents value for money as it is delivering on the above requirements in the most economic and efficient way.

Exercise: Stakeholder's preferred option

- On your tables there are some sheets listing the five options considered
- Following today's discussion around the options and their assessment, please indicate on the sheet which is your preferred option.

RIIO2 Next Steps

- October 2019 - business plans submitted to Ofgem and to the Stakeholder Challenge Group
- December 2019 – submission of business plans to Ofgem and publication

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Appendix 1

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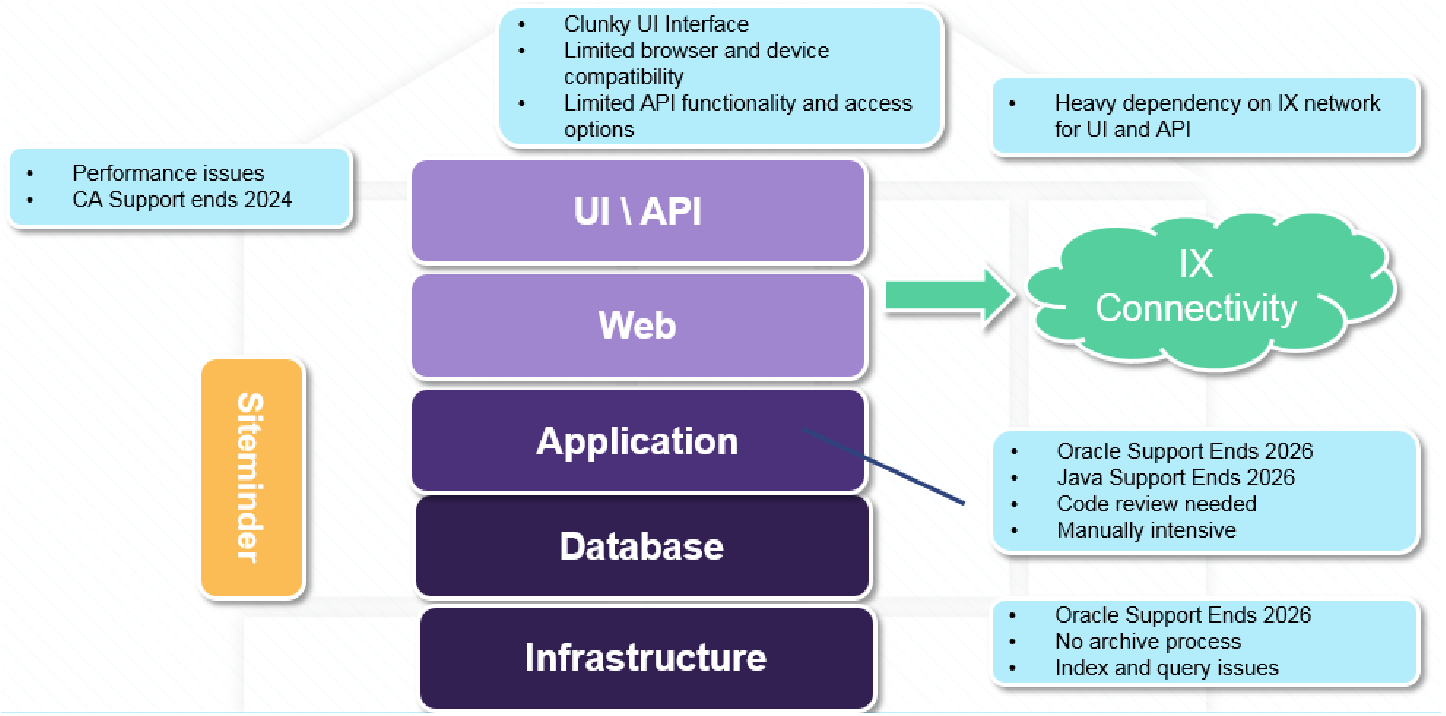
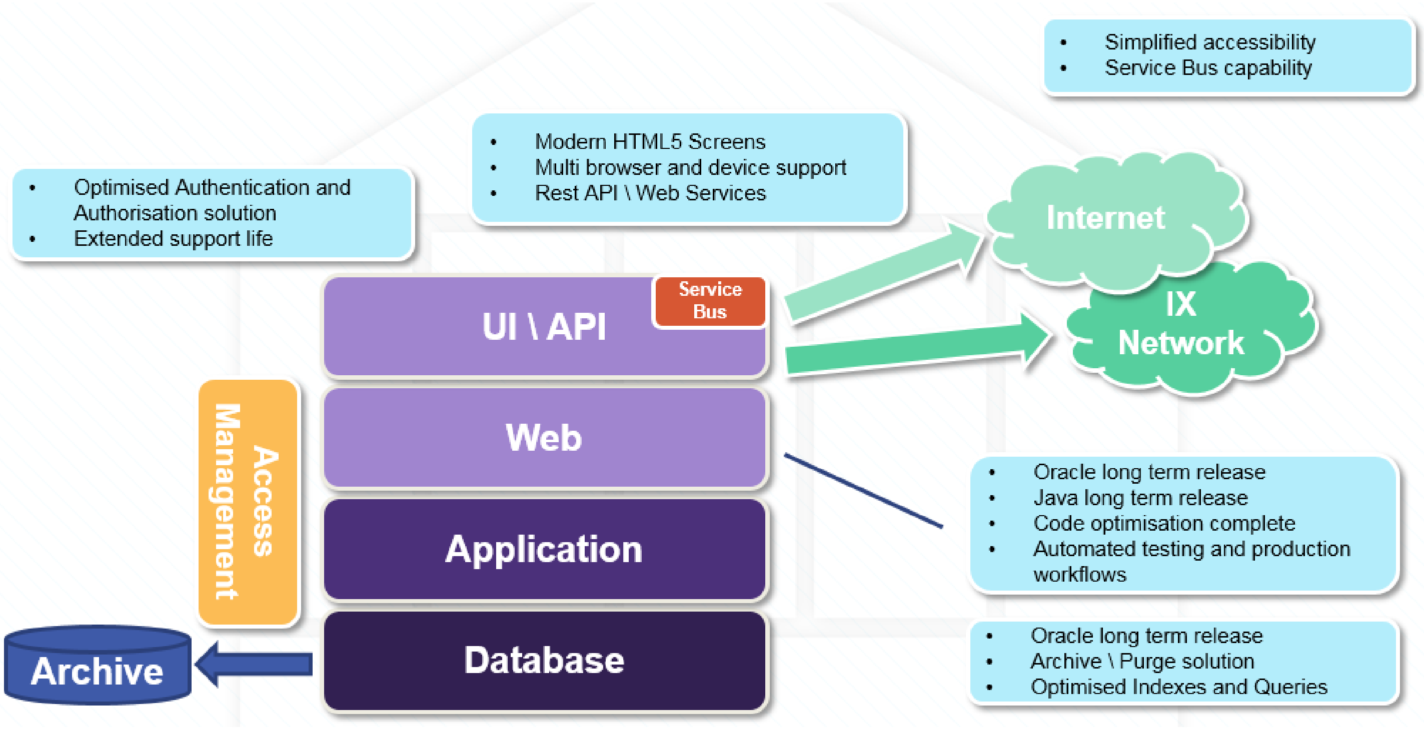
Gemini As-is



Clunky UI Interface
Limited browser and device compatibility
Limited API functionality and access options
Heavy dependency on IX network for UI and API
Performance issues
CA Support ends 2024
UI \ API
Web
IX Connectivity
Siteminder
Application
Database
Infrastructure
Oracle Support Ends 2026
Java Support Ends 2026
Code review needed
Manually intensive
Oracle Support Ends 2026
No archive process
Index and query issues

Gemini To-Be



• Simplified accessibility
• Service Bus capability
• Modern HTML5 Screens
• Multi browser and device support
• Rest API \ Web Services
• Optimised Authentication and Authorisation solution
• Extended support life
Internet
IX Network
UI \ API
Service Bus
Web
Application
Database
Access Management
Archive
• Oracle long term release
• Java long term release
• Code optimisation complete
• Automated testing and production workflows
• Oracle long term release
• Archive \ Purge solution
• Optimised Indexes and Queries

How are the challenges mitigated

Issue	Addressed by
Slow Performance	Review & optimise code Query optimisation & indexes Introduce archiving coupled with database optimisation
Expiring Siteminder support	Replace (Also improves performance)
Expiring Oracle DB & environment support	Maintain database at latest levels
Clunky, old fashioned UI	Modernise via HTML 5
Only IE 11 supported	Modernisation will support most browsers
Limited, slow API	Replace with REST API – faster and more flexible
IX Dependency	Access via secure Internet
Java 1.8 Support Expiring	Upgrade to later Java versions
Manually intensive to support	Introduce process & test automation

UI, Code and Database Improvements

Improvement	Activity	Benefits
HTML5 Screen Implementation	Creation of all new UI screens with HTML5 code – this would be done in parallel to existing screens meaning avoiding downtime.	• Improved Performance • Support for multiple browsers • Support for multiple device types (e.g. mobile)
API Improvement Activities	Creation of new REST APIs supporting existing and additional API functionality (based on industry feedback) – This could be delivered using the B2B platform and expanding this current functionality	• Better performance than current API. • Internet facing APIs offering more accessible solution • Greater functionality made available • Better compatibility making it easier for partners to utilise.
SiteMinder Removal and Replacement	Removal of current SiteMinder implementation and replacement with an equivalent replacement, most likely using Oracle functionality	• Allows easier and more flexible approach to HTML5 screen implementation • Improved performance when using UI • Reduced license costs • Easier testing and upgrades of platform
Code Optimisation	Review of existing code using analyser and removal\update of code identified as Sub-optimal or unnecessary	• Improved performance of UI and application • Testing and upgrades simplified
Query Tuning	Review and optimisation of existing queries	• Improved performance of UI and application
Indexing	Review of database query activity and creation of new indexes where warranted and review of the effectiveness of current indexes	• Improved performance of UI and application
Archiving \ Purging	Implementation of data archival policies with enduring process in place to manage this by archiving to separate data store or purging as deemed necessary	• Lower DB overheads and maintenance requirements • Proactive management of database scale and size • Potential performance improvements
Redesign of Screens	Identification of screens that perform badly due to poor design and reworking these	• Improved performance and UI and application

Gas System Operator

08

Incentives & Network Capability

nationalgrid

Network Capability Progress Update

10 June 2019

nationalgrid

The challenge from Ofgem's December consultation

1

Demonstrate we can measure the capability of the network

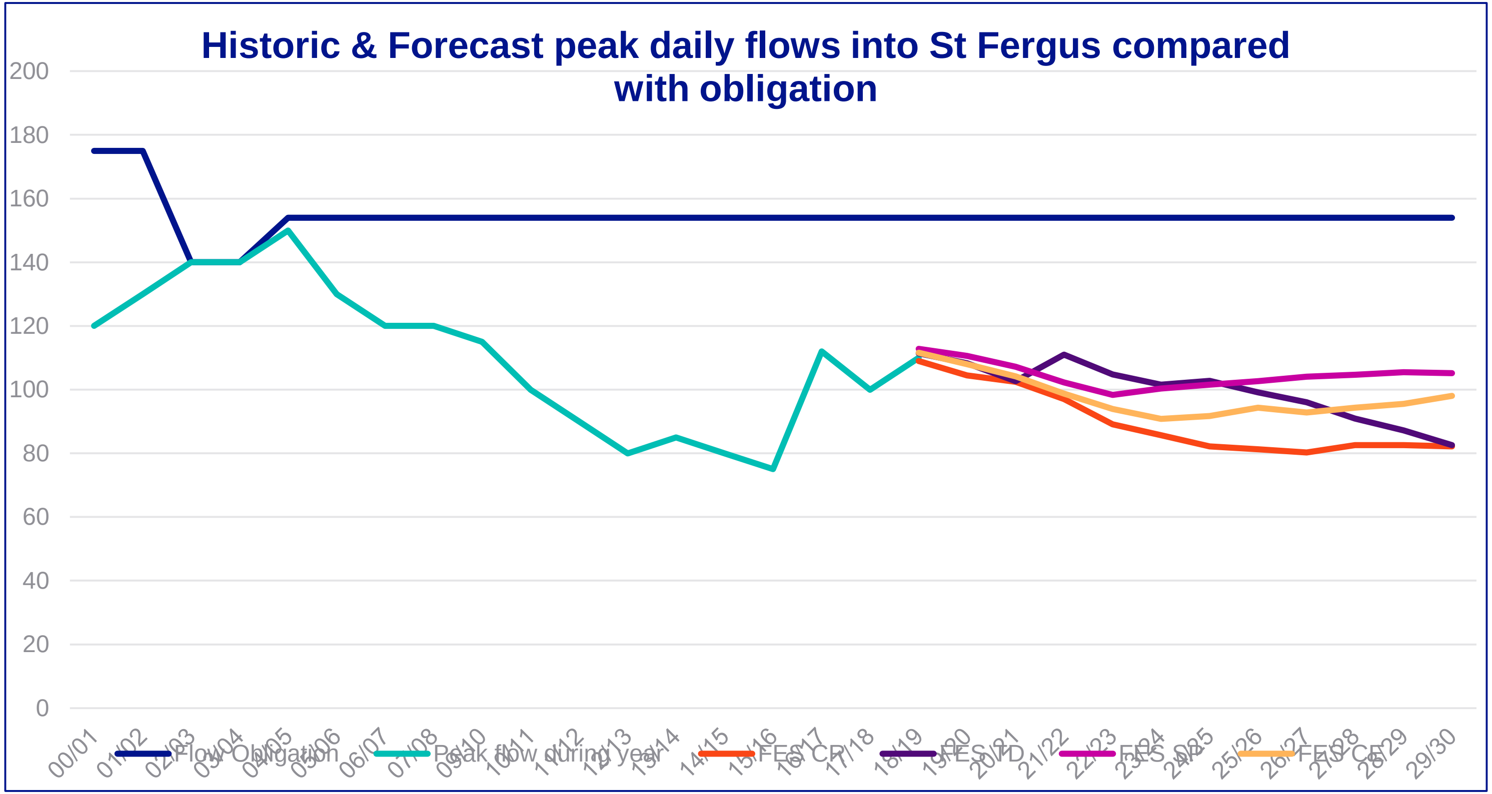
2

Demonstrate we understand what our stakeholders want to do

3

Demonstrate that the business plan links to delivery of service

Why have Ofgem given us this challenge?



Capability is about more than peak flow…

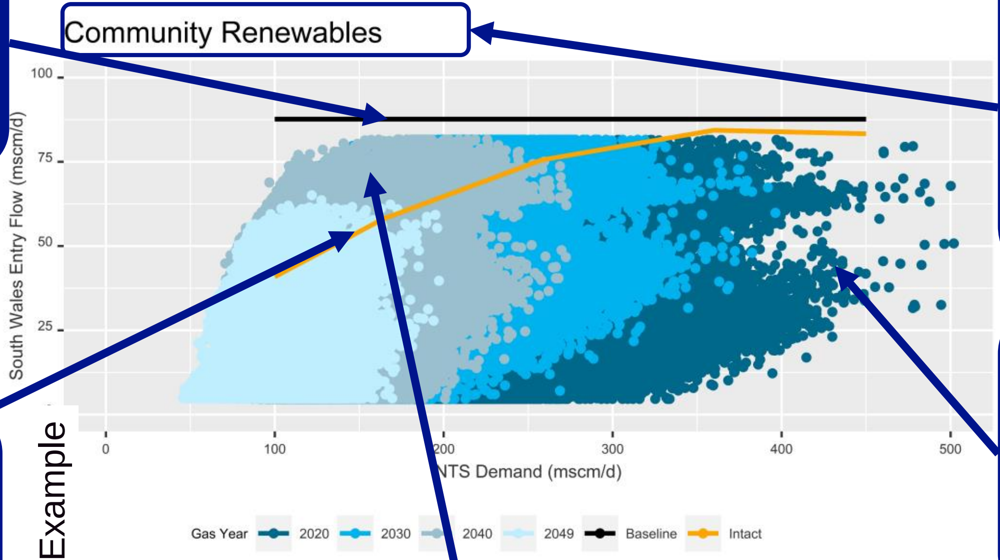
Time of year	Entry flow	Exit flow	Transfer out
Winter peak	154mcmd	60mcmd	94mcmd
Actual summer flows (2012)	20mcmd	20mcmd	0mcmd
Actual summer flows (2016)	105mcmd	20mcmd	85mcmd

The capability provided by the network can be required all year round

What do the metrics look like, and how do you read them?

The **black** line shows the capacity baseline at entry, for each zone.

Example



Example

Each zone of the network will have 4 graphs. These 4 graphs show the projected supply and demand in each of the 4x Future Energy Scenarios (FES)

The cluster of dots show the projected supply and demand scenarios in future. Dark blue = 20/10 through to pale blue = 49/50

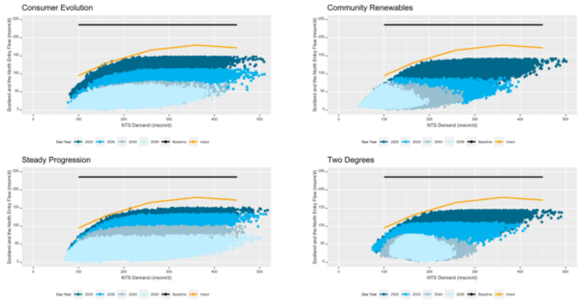
The orange line shows the level of capability that can be delivered as per the assets in our October draft business plan.

Where there are dots above the line, this is an indication of a potential constraint

Network Capability metrics

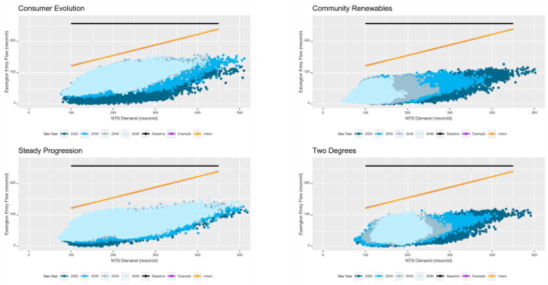
Scotland and the North Entry Capability Plots

High Continent



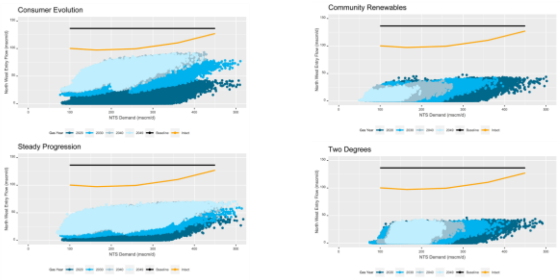
North East Entry Capability Plots

High Continent



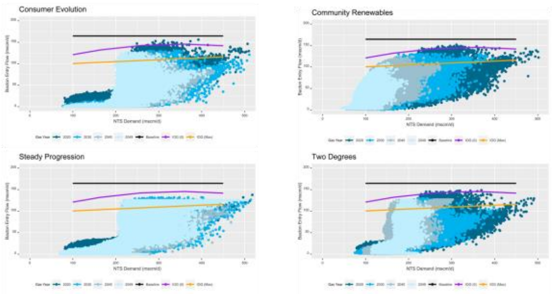
North West Entry Capability Plots

High Continent



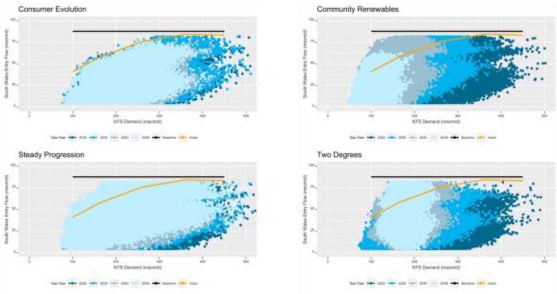
Bacton Entry Capability Plots

High Continent



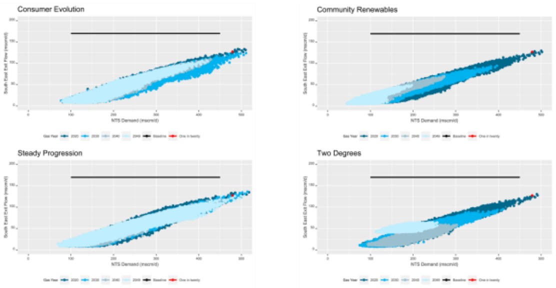
South Wales Entry Capability Plots

High LNG



South East Exit Capability Plots

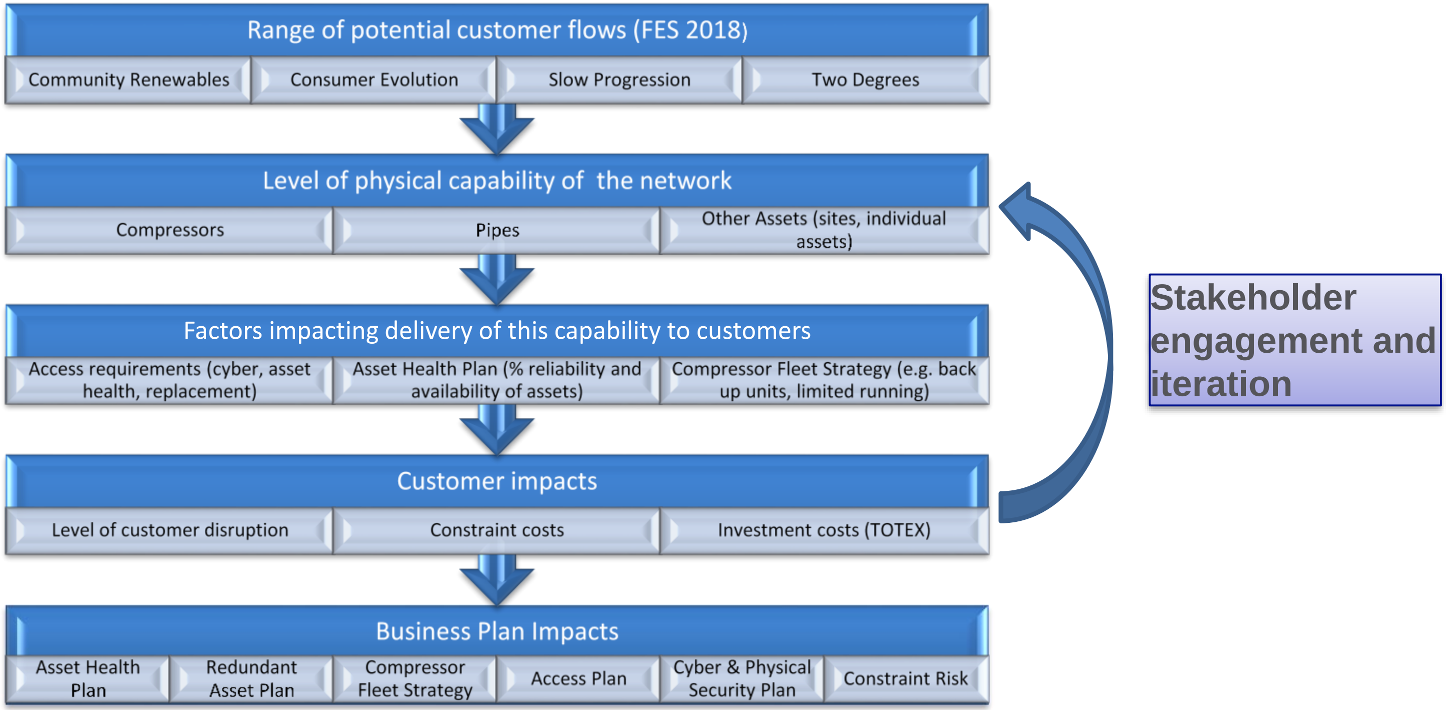
High Continent



Compressors – plan for RIIO2 and RIIO3

	RIIO1	RIIO2	RIIO3
New Unit (MCP)	0	2	5
New Unit (IED)	4	4	0
Non-Compliant (MCP)	27	22	0
Derogated	11	1	5
Decomission	0	18	20
Disconnected	5	2	0
Compliant Gas	23	27	33
Electric Drive	9	9	9
Total Units	79	67	52
Total Operational Units	74	65	52

I want to move gas on & off the NTS, when & where I want



Ofgem set out their requirements for a “Baseline Obligated Capacities Report

Baseline Obligated Capacities Report

Setting out the results of its assessment of the appropriateness of the current levels of baseline obligated entry and exit capacities including any proposals for revisions to baseline capacities, and was to be developed with extensive stakeholder consultation

National Grid RIIO2 Incentives

September 2019

nationalgrid

Key principles of incentives

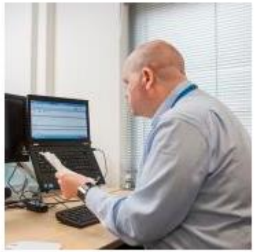
We believe Incentives should:

- Provide additional consumer value in the short or long term
- Have a robust baseline
- Drive improve performance in areas above and beyond business as usual obligations
- Be measurable and quantifiable
- Ensure we positively contribute to incentive performance.
- Recognise the changing landscape in determining the scheme design and target performance.
- Promote investment and innovation to unlock additional consumer value, both now and into the future (financial or otherwise).
- Be supported by stakeholders and aligned to stakeholder priorities.

RIIO-1 Incentives

Constraint management

Residual balancing



NTS shrinkage

Information provision

Transportation support services (TSS)

Demand forecasting

Maintenance

Greenhouse gas (GHG) emissions

Unaccounted for Gas (UAG)

Operating Margins (OM)

Retain

Reputational

Removed at shallow review

RIIO-2 Incentives


Constraint management


Residual balancing


NTS shrinkage


Demand forecasting


Maintenance

Environmental


Greenhouse gas (GHG) emissions


Information provision


Unaccounted for Gas (UAG)

RIIO2 Incentive summary

Scheme	T1 Cap and Collar	T2 Cap and Collar – current position	RIIO2 current position
Constraint Management	+£26.0m -£78.0m	TBC	Retain scheme, scheme design to be reviewed after completion of network capability review. Consider changes to scheme with regards to the high impact/low probability nature of scheme.
Shrinkage	+£7.0m -£7.0m	+£5.0m -£5.0m	Retain scheme with access to seasonal markets to drive further consumer savings. Subject to proposed changes to the electricity charging regime, remove the TNUoS element.
Demand Forecasting	+£20.0m -£2.5m	+£16.0m -£2.5m	Retain schemes. Make incentive tougher to achieve against by reducing the performance gradient, recognising that demand forecasting is becoming increasingly challenging. We have ruled out the possibility of using a volatility adjuster as we believe it is right for us to be incentivised on forecasting this volatility.
Maintenance	+£0.7m -£1.0m	+£1.2m -£1.5m	Retain and expand to cover the wider range of maintenance activities supported by stakeholder feedback. Recognising that the volume of planned maintenance likely to be higher.
GHG	+£0.0m -£unlimited	+£1.5m -£1.5m	Retain scheme which includes more penal rates with an upside to encourage further performance improvements. Potentially include within the broader environmental incentive package.
Residual balancing	+£2.0m -£3.5m	+£1.6m -£2.8m	Retain scheme. Make incentive tougher to achieve against by reducing the performance gradient, recognising a changing and more challenging energy landscape. Propose amending the linepack component of scheme to drive the right behaviour during seasonal transitions between winter and summer and vice versa.
Environmental	n/a	TBC	A requirement from Ofgem’s May decision, across all sectors, was the delivery of an Environmental Action Plan and Annual Environmental Report. This is in the early stages of development and will be included in our consultation with stakeholders.

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