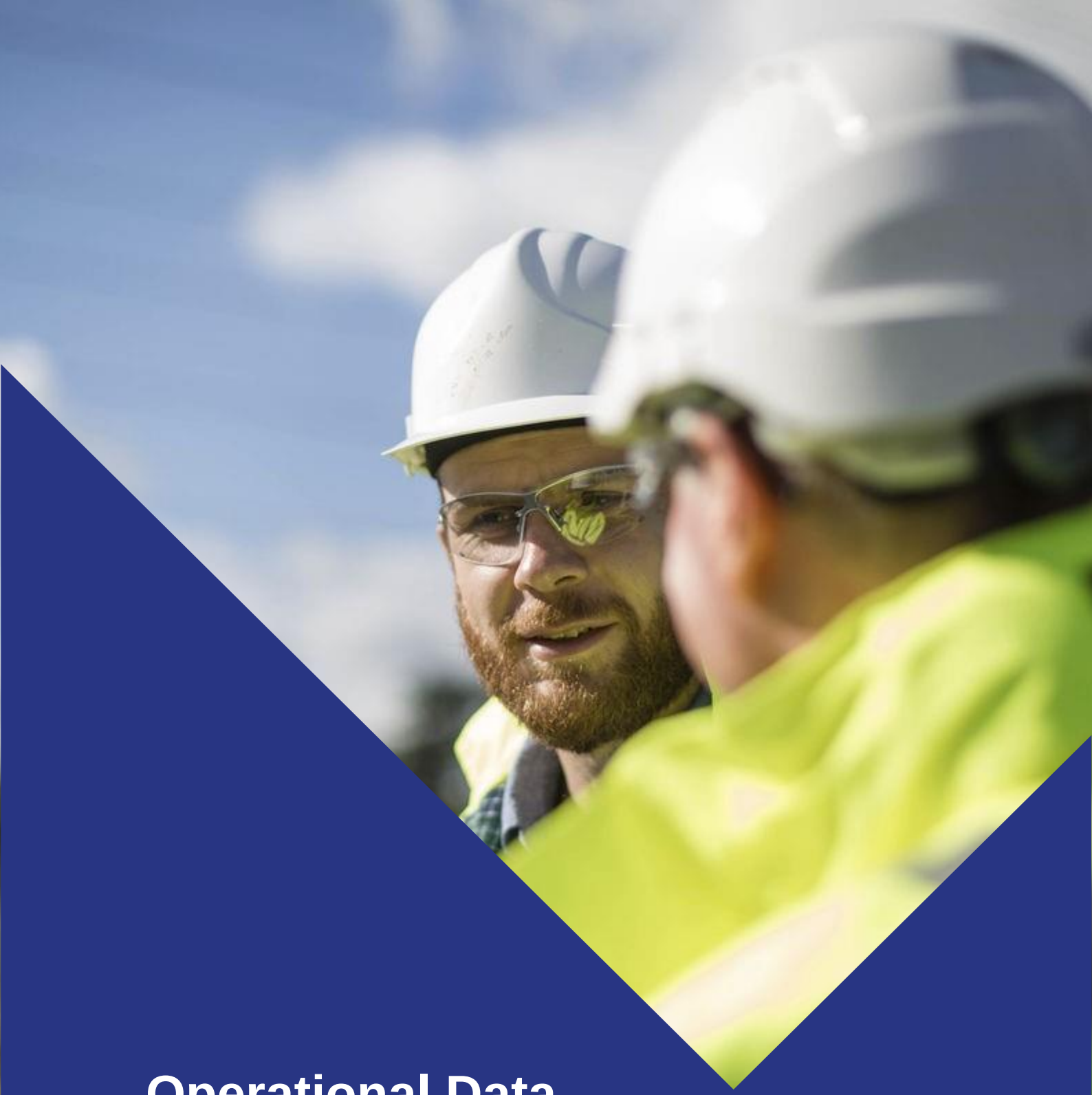


Operational Data User Guide

Gas Operations

Version 1

nationalgrid

Contents

Foreword

In response to a number of recent industry engagements, National Grid has mobilised a programme of work to identify and deliver enhancements to the operational data currently provided to the industry through its website.

We hope you find the document useful and, urge you to get in contact with any feedback that you may have in response. National Grid values its customer and stakeholder feedback and looks to build on any comments provided.

Regards,

Karen Thompson, Operational Liaison Manager

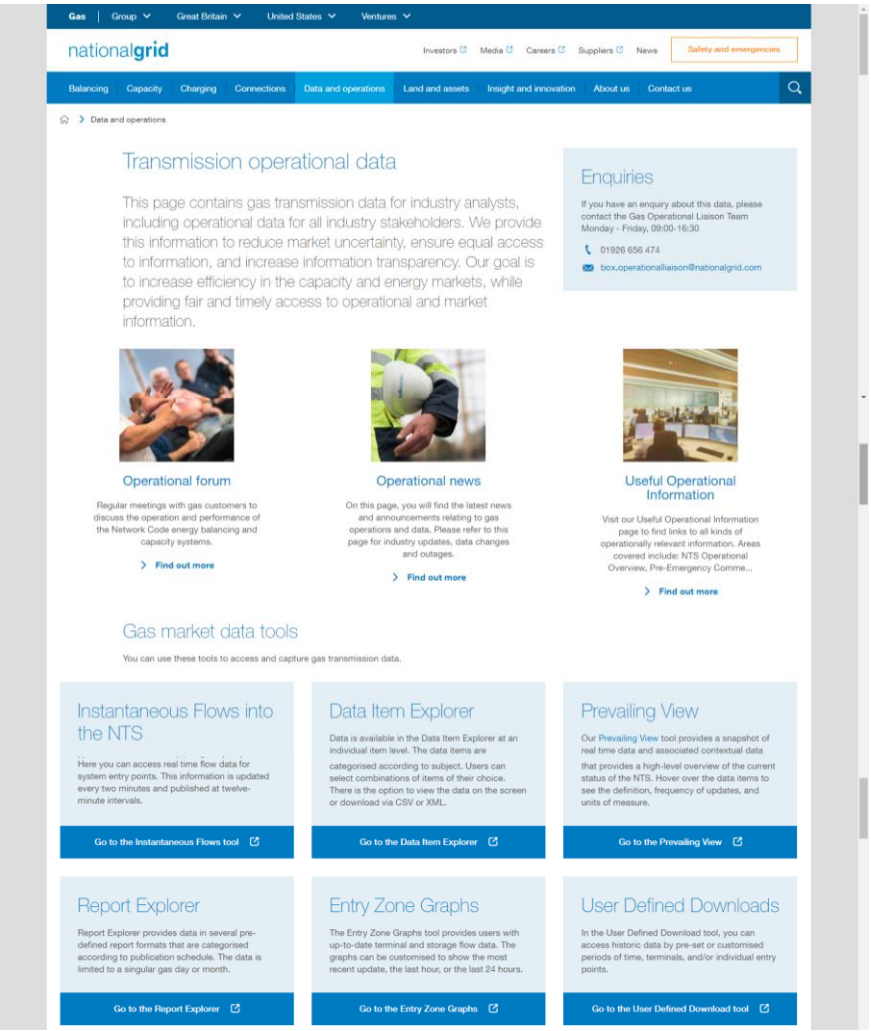
Karen.Thompson@nationalgrid.com

Market Information Provision Initiative (MIPI)

What is MIPI?

Market Information Provision Initiative (MIPI) is a web-based, information platform that serves market participants with a wide-ranging view of Gas Transmission operational data.

Managed by National Grid, and accessed via our Transmission Operational Data webpage.



Why does National Grid provide market information?

National Grid currently provides information for a number of reasons:

- Special Condition 8F: Provision of Information of National Grid's NTS Licence;
- National Grid's obligated data set as defined by UNC Section V9, initiated through GB regulated requirements;
- EU Legislation and EU Code requirements to provide data in our role as TSO;
- Additional data provided by National Grid which was historically viewed as useful for the industry;
- Distribution Network data and Storage Operator data which is the responsibility of these industry sectors, but been made available through MIPI at the request of Ofgem.

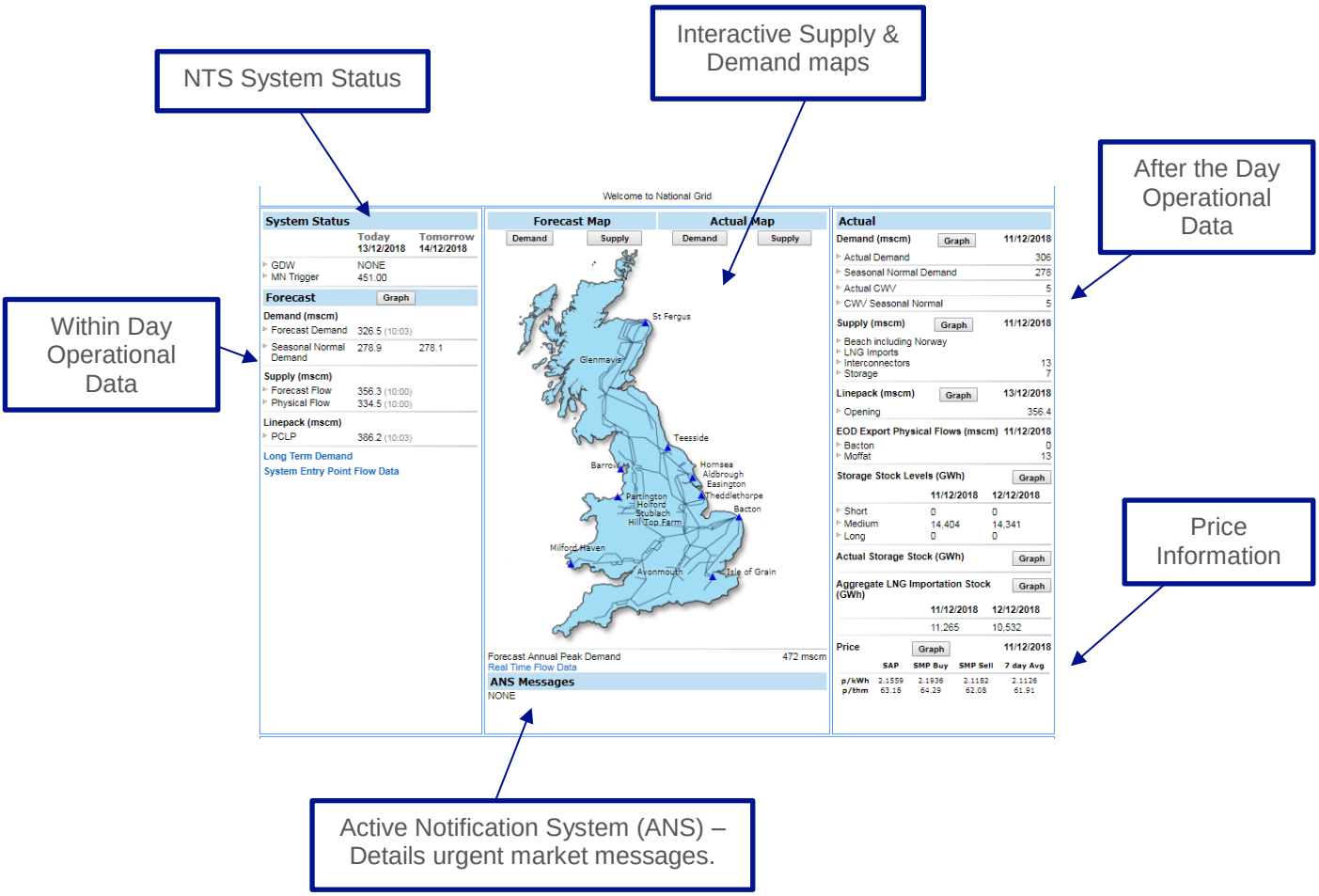
1

Sources of Information

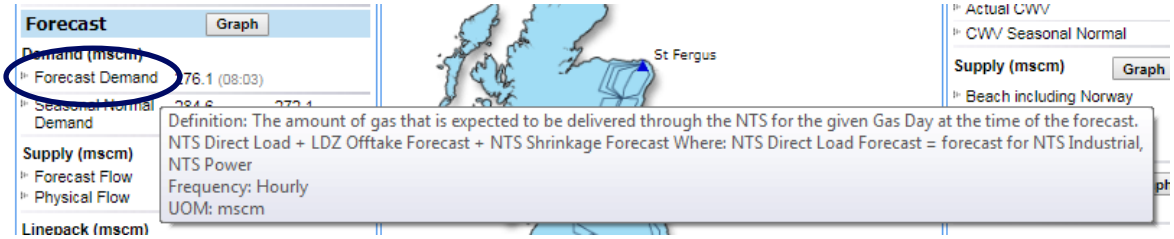
nationalgrid

Prevailing View

Our Prevailing View tool provides a snapshot of real time data and associated contextual data that in turn, illustrates at a high-level, the current status of the National Transmission System (NTS).



Prevailing View allows users to hover over individual data items to see the definition, frequency of updates, and units of measure. For example:

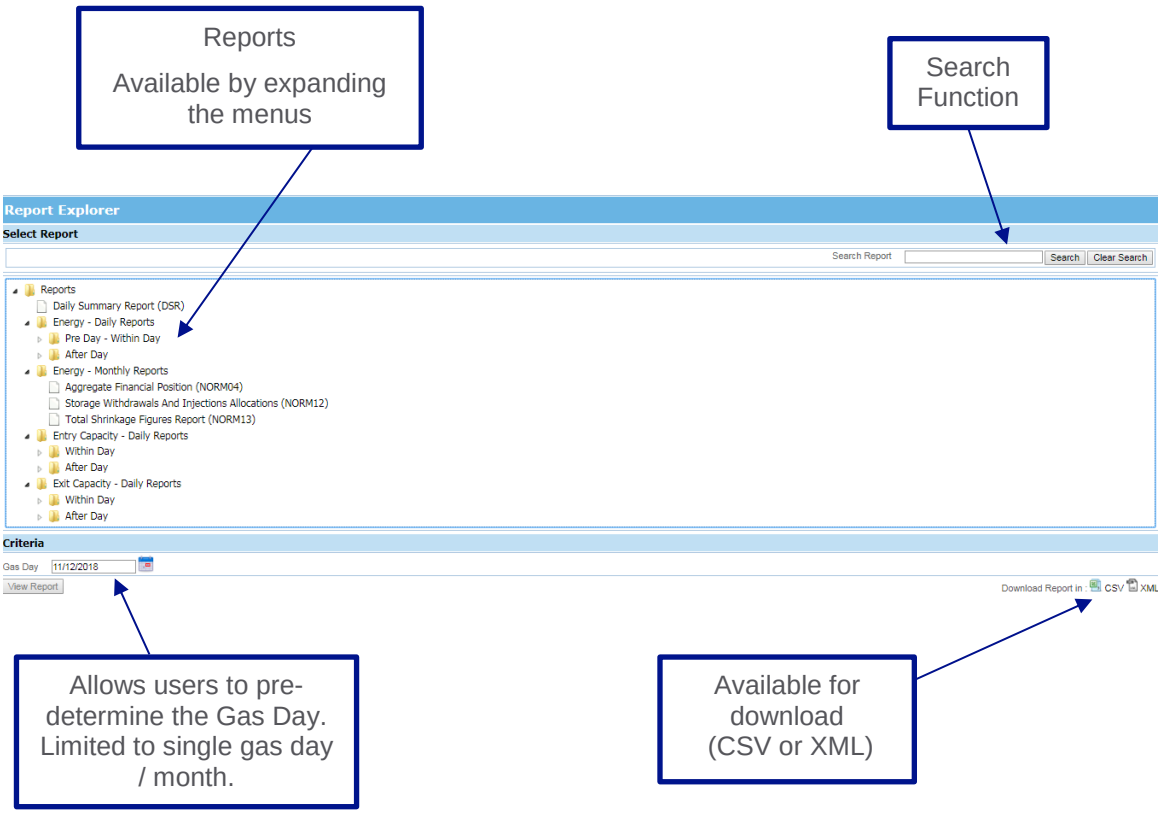


Instantaneous Flows

This report allows users to access real time flow data for system entry points. The information is captured every two minutes and published at twelve-minute intervals.

Report Explorer

Report Explorer provides data in several pre-defined report formats that are categorised according to publication schedule. The data is limited to a singular gas day or month, which is dictated by the user.



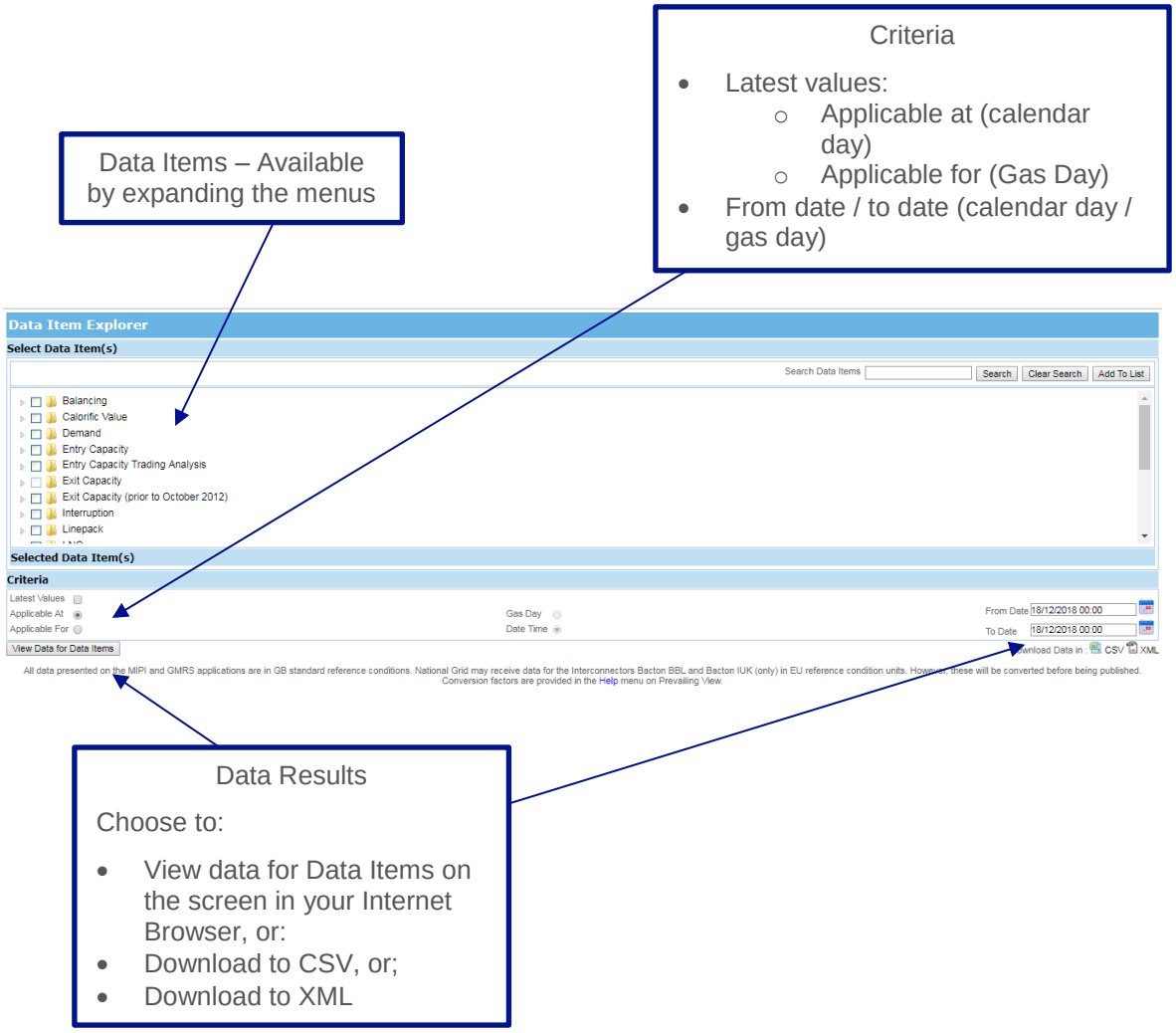
How to Use:

1. Select the report you wish to view.
2. Enter the Criteria (Gas Day).
3. Then choose whether to view via the web browser by selecting ‘View Report’ or download by selecting the ‘Download in CSV / XML’.

Data Item Explorer

All data is available at an individual data item level, enabling users to select a combination of items at their choice. These are categorised in expanding menus and listed according to their subject. Users can select combinations of items of their choice.

In general, 5 years of rolling historic data can be accessed for most data items but some items may have less than 5 years of data, if introduced less than 5 years ago.



How to Use:

1. Select the individual Data Items that you require.
2. Enter the Criteria, including the time frame in which you would like the data to be displayed.
3. Then choose whether to view via the web browser by selecting ‘View Data for Data Items’ or download by selecting the ‘Download in CSV / XML’.

2

Pre / Within Day (D- / D)

nationalgrid

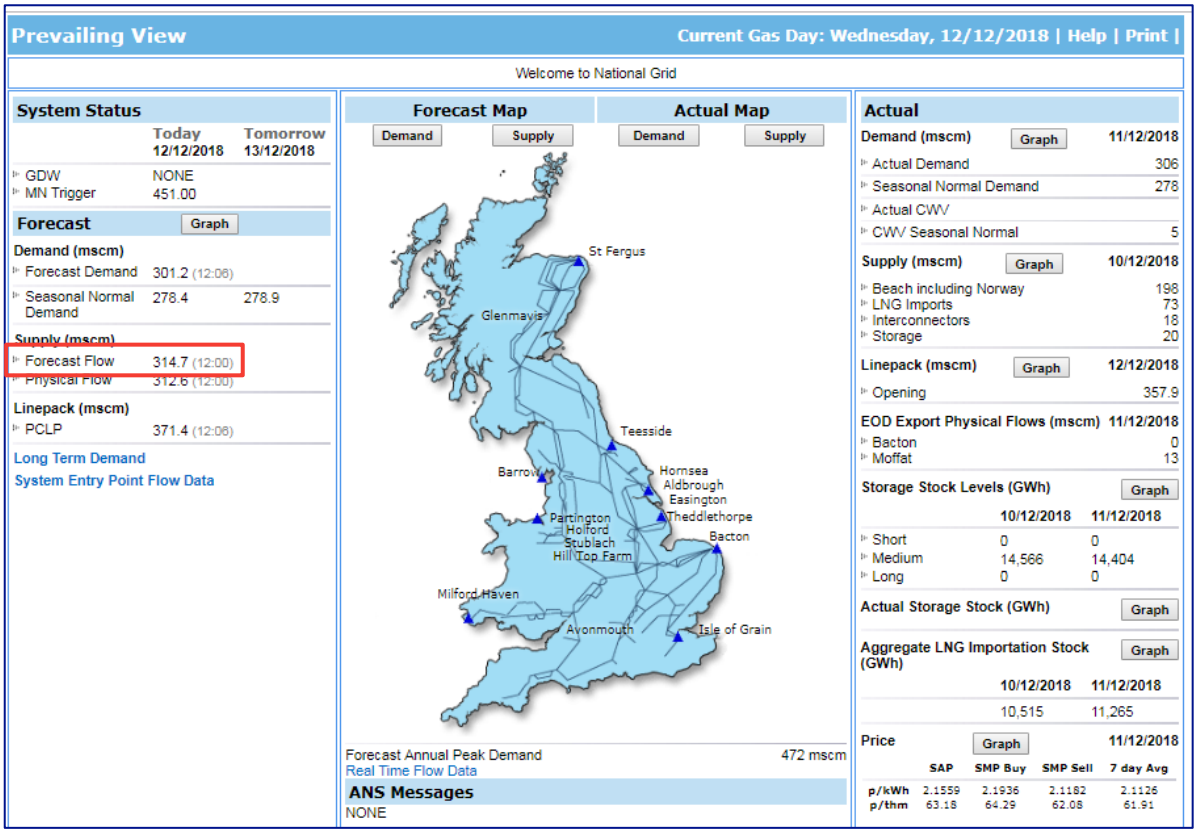
Supply

Forecast Flow

Forecast aggregate flows into the NTS on that hour bar, based on the received delivery flow notifications and storage flow notifications for all entry points.

- **Available from:** The start of the gas day (05:00).
- **Frequency:** Hourly
- **Source of Information:** Information is provided by suppliers in the form of Daily Flow Notifications (DFNs) and Storage Flow Notifications (SFNs).
- **Unit of Measure:** mscm/d

  Location: Prevailing View & for hourly data, see: *End of Day Aggregate Forecast NTS System Entry Flows* (NTSAFF) in Report Explorer.

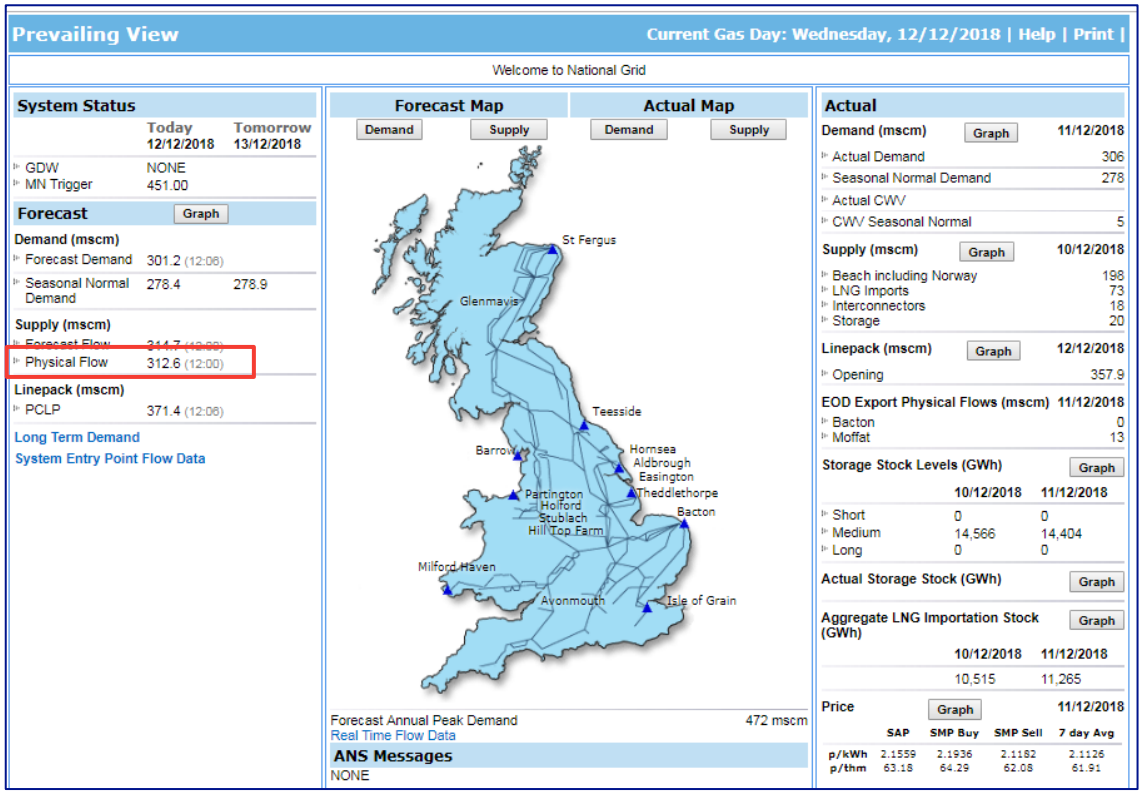


- **Methodology:** Summation of the hourly flow for the subsequent hour bar.

Physical Flow

Physical aggregated flows into the NTS, based on metered instantaneous flows on that hour bar.

- **Frequency:** Hourly
- **Source of Information:** Is the actual telemetered flow up to that point in time and includes all supply flows onto the NTS.
- **Unit of Measure:** mscm/d
- **Location:** Prevailing View & for hourly data, see: *Aggregate Physical NTS System Entry Flows* (NTSAPF) in Report Explorer. Instantaneous Flow data can also be found by utilising the Instantaneous Flow tool.



Linepack (Opening & Predicted Closing Linepack (PCLP))

Linepack is the total of volume of gas contained within the system. The methodology for calculating linepack is set out in our Transporters License.

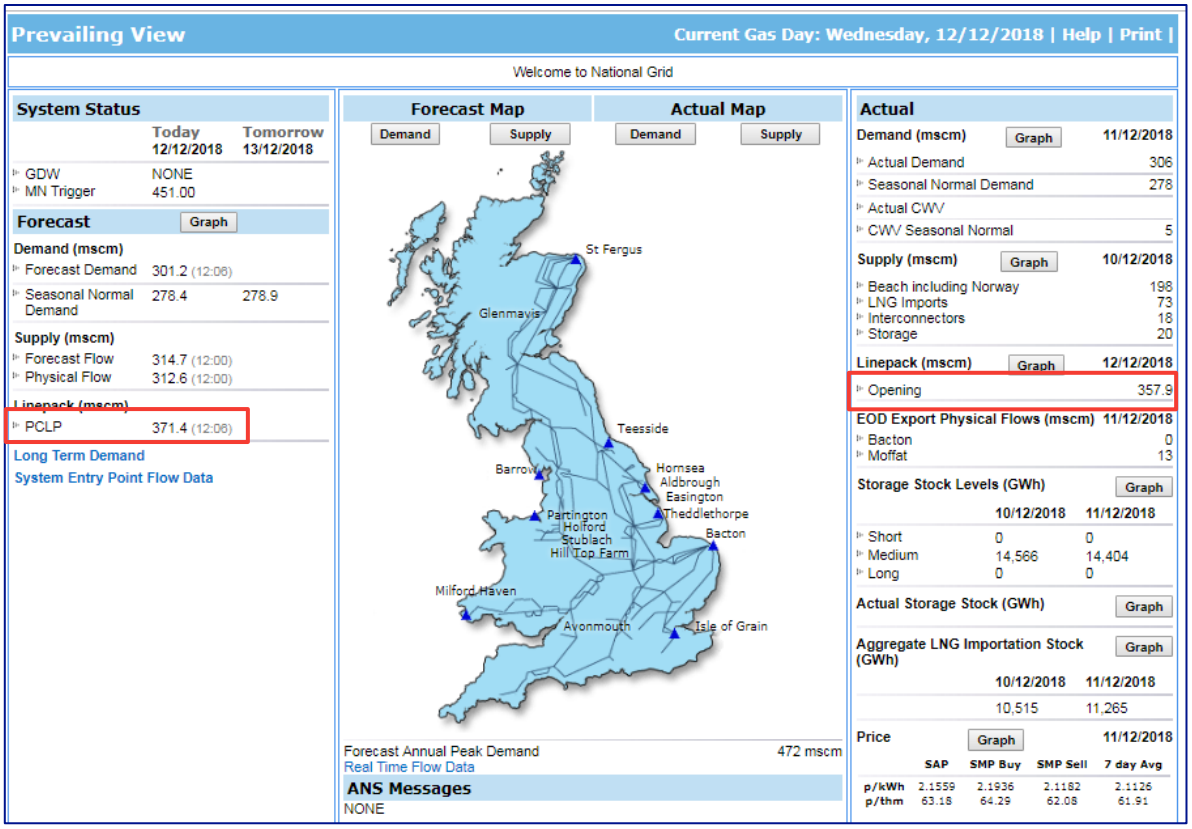
Linepack considers only volume and is measured in millions of cubic meters (mscm), which is the volume the gas would occupy at standard atmospheric pressure.

– Predicted Closing Linepack (PCLP): Opening linepack plus the latest supply estimate for the gas day, minus latest demand estimate for the gas day.

– Opening linepack: Is the actual linepack available at the start of the gas day (05:00).

Supply = PCLP – Opening Linepack

- **Available from:** Midnight of the previous gas day through to 04:00 of the gas day.
- **Frequency:** Hourly
- **Unit of Measure:** mscm
- **Location:** Prevailing View & D+ (days after the current gas day) data, see: *NTS Actual Linepack Report* in Report Explorer. PCLP can also detailed in the *System Status Information report* (*NB92*).



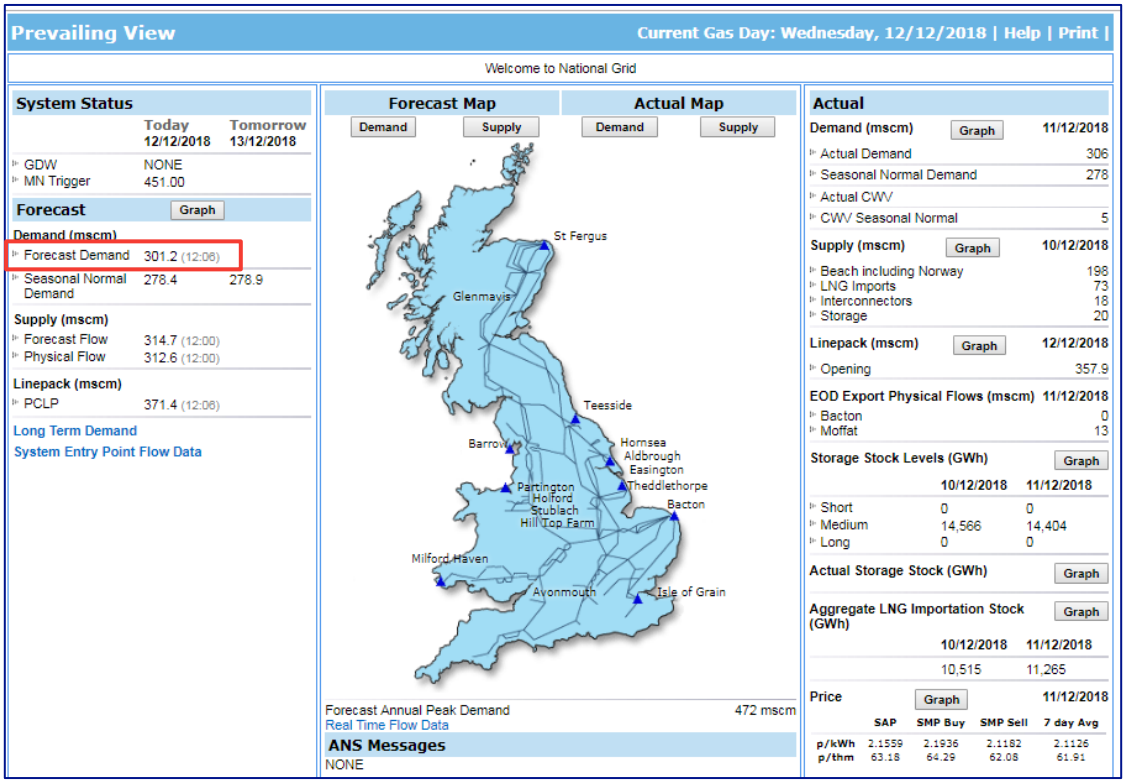
For more information relating to Linepack, including: physical considerations, seasonal variations and the effect supplies and demands have on linepack swing, please refer to our Linepack presentation.

Demand

Forecast Demand

The amount of gas that is expected to be taken from the NTS by the end of the gas day.

- **Frequency:** Hourly
- **Source of Information:**
  - D-1 (13:00 – 16:00) – Based on National Grid's forecast, as indicated by internal modelling systems.
  - D-1 (00:00) – Based on the information provided by storage operators, industrial connectors, power stations, interconnectors and distribution networks.
- **Unit of Measure:** mscm/d
- **Location:** Prevailing View & for hourly data, see: *System Status Information (NB92)* in Report Explorer or *Forecast Demands (SISR03)*.



- **Methodology:** NTS Direct Load (interconnectors, storage sites, power stations and industrials) + LDZ Offtake Forecast + NTS Shrinkage Forecast.

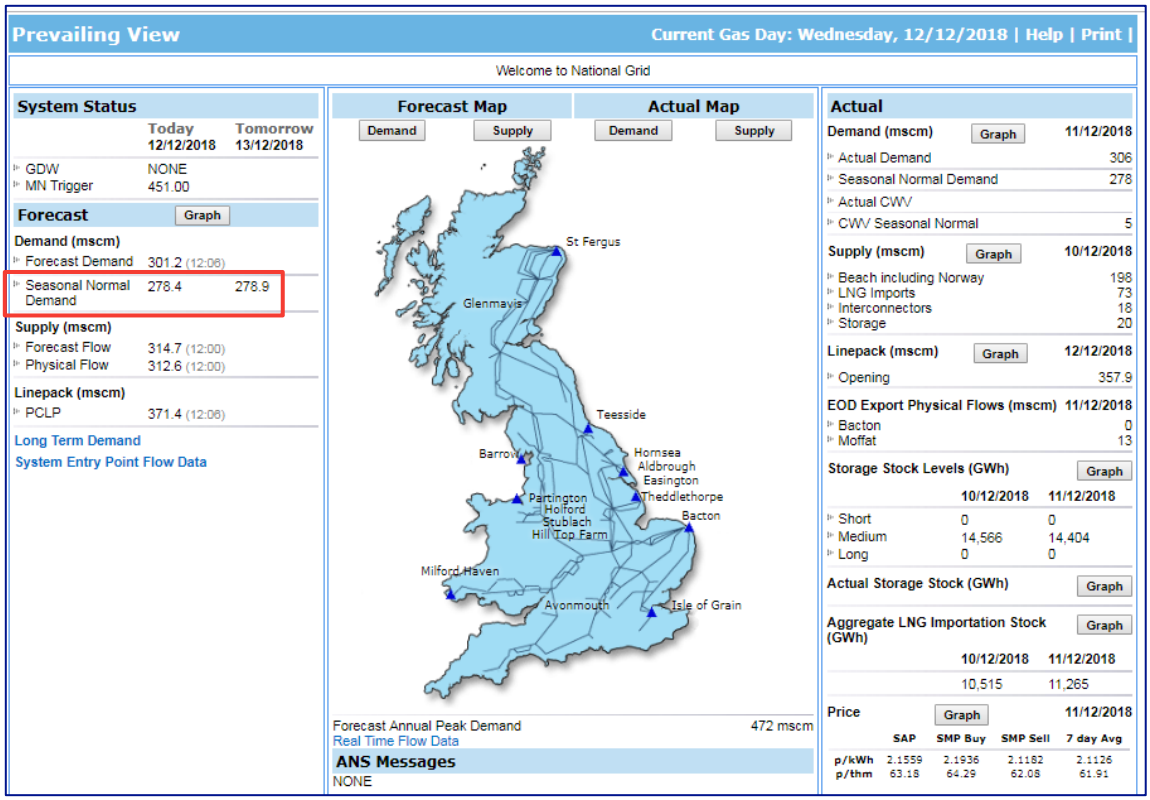
The ***SISR03*** report (accessed through Report Explorer) relates to the LDZ data provided by the distribution networks that we publish on their behalf. Please note that the LDZ forecast data at offtake is not available in MIPI.

Seasonal Normal Demand

Seasonal Normal Demand is the level of gas demand that would be expected on each day of the year. It is calculated using historically observed values that have been weighted to account for climate change.

The Seasonal Normal Demand figures include an estimate of NTS exports to Europe and NTS storage injection. It is worth noting that these elements may be dependent upon both UK and continental prices and any potential supply/demand imbalances that may exist and therefore there may be significant variance from the expected values on the day.

- **Frequency:** Daily
- **Unit of Measure:** mscm/d
- **Location:** Prevailing View and Supplementary Reports section of the Transmission Operational Data webpage (Supplementary Reports > Other Reports > CWV and Seasonal Normal Demands Rolling 5 Years).

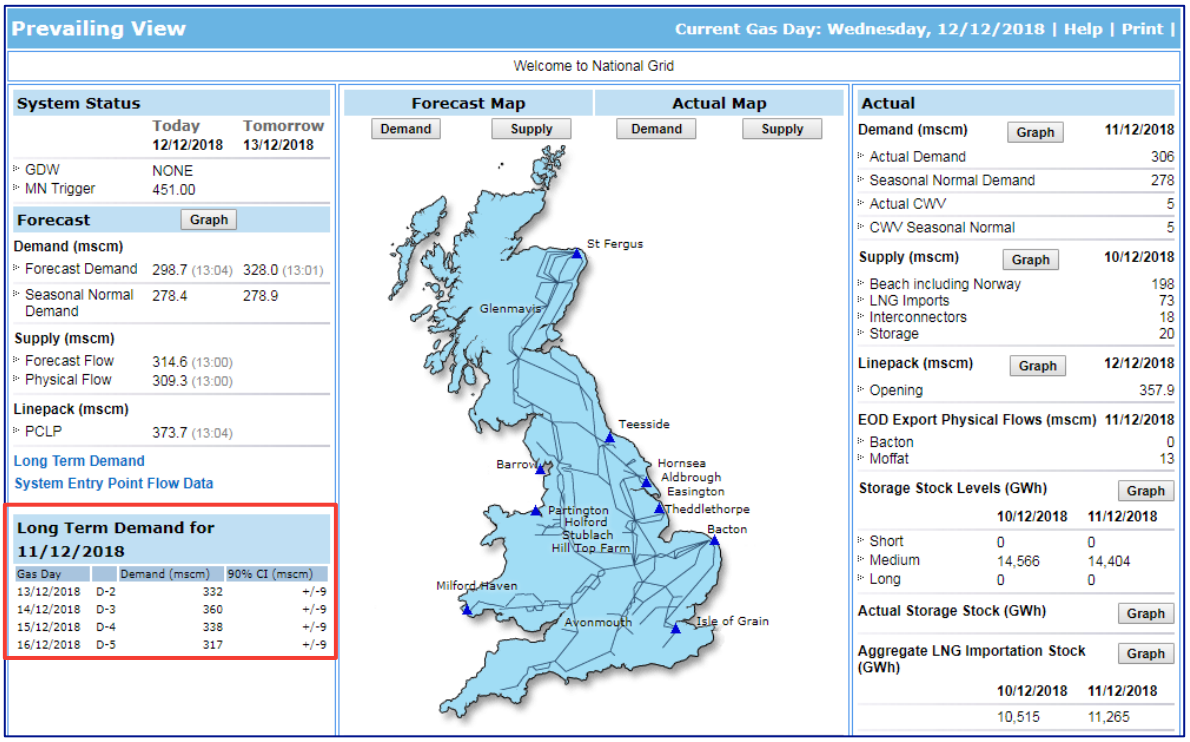


Long Term Demand

Details our physical demand forecast for the NTS for the period D-2 to D-5 (2 days before the Gas Day to 5 days before the Gas Day).

This information forms a National Grid incentivised forecast. For more information about National Grid's Gas System Operator Incentives, please follow the link to our 2018/19 Supporting Information document.

- **Frequency:** Daily (16:00)
- **Unit of Measure:** mscm/d
- **Location:** Prevailing View



Other

Margins Notice (MN) & Margins Notice Trigger

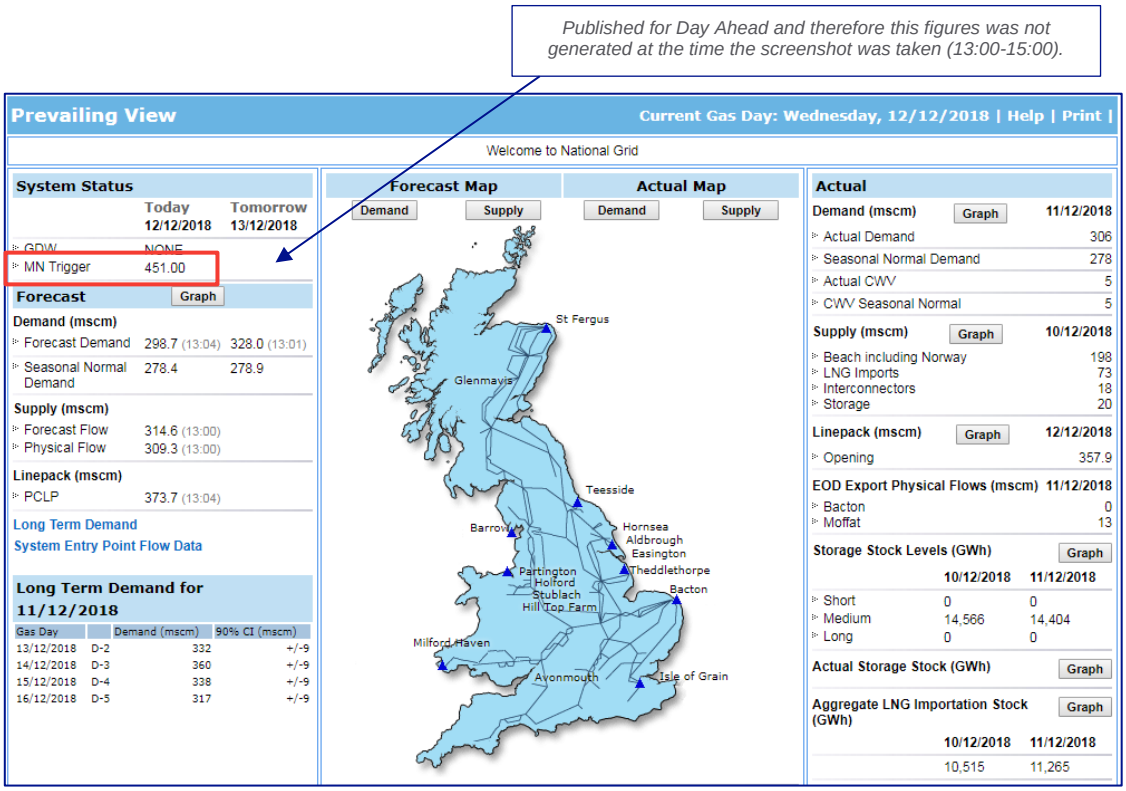
The MN is provided day ahead as a high-level prompt to the market of a potential supply/demand mismatch for the following gas day. Based on forecasted Non-Storage Stocks (NSS) and available storage. See Acronyms for definition of NSS.

For more information relating to a MN, please follow the link to the Transportation Principle Document (5.9.3).

- It encourages NTS users to reassess their position, relative to prevailing forecasts.
- A Margins Notice will remain in place until the end of the applicable gas day.
- The MN Trigger is set at an assumed NSS Capability, plus storage. The initial NSS level is published in the Winter Outlook Report each year and is updated if necessary, in light of actual winter flows.
- Storage is assumed to run at max. rate for 2 days and then decreased.

The data item replaced the prevailing Gas Balancing Alert (GBA) arrangements in December 2012, following approval of UNC modification 0415.

- **Frequency:** Daily (between 13:00 – 15:00 for day ahead)
- **Source of Information:** Includes Storage Stock Level as provided by storage sites.
- **Unit of Measure:** mscm/d
- **Location:** Prevailing View. We publish a Daily Margins Notice (DMN) report providing industry with a rolling five-day view of supply and demand data and information relating to the storage safety monitors. This can be found on the National Grid Balancing webpage.



For the Daily Margins Notice Report, follow this link.

Gas Deficit Warning (GDW)

As Gas Deficit Warning is a notice of an expected significant end of day supply/demand imbalance and is issue to encourage action by market participants to balance their own portfolios and potentially respond to balancing requests from National Grid.

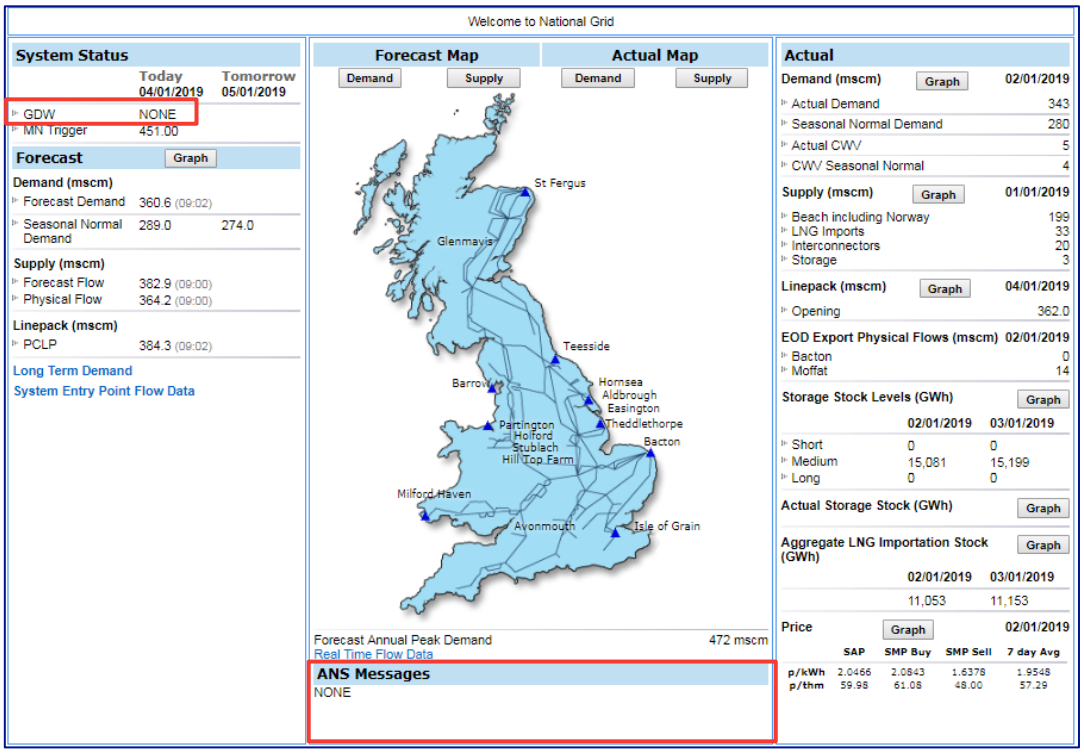
For more information relating to a Gas Deficit Warning, please follow the link to the Transportation Principle Document (5.9.5).

- A GDW has no pre-defined triggers
- Based on judgement of the Gas System Operator
- Can be issued in advance or during the actual gas day
- Can be withdrawn via notice at any time

Triggers to issue a GDW may include:

- Actual / forecast supply
- Actual / forecast demand
- Predicted closing linepack
- Actual linepack
- Other relevant information
- Market intelligence

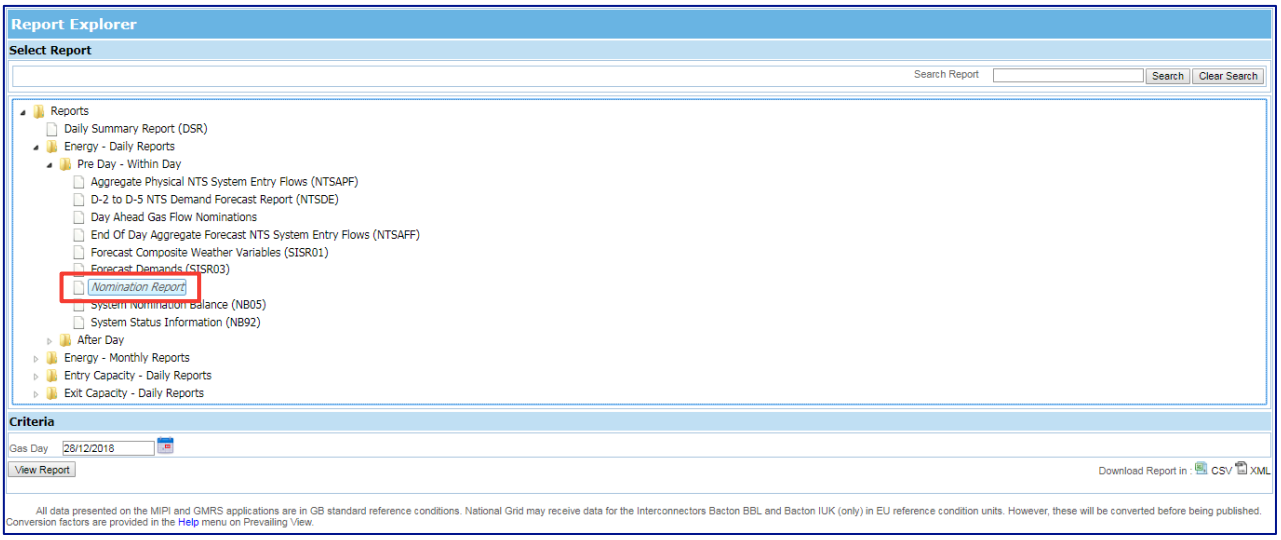
- **Frequency:** National Grid may issue a Gas Deficit Warning at any time.
- **Unit of Measure:** n/a
- **Location:** Prevailing View (GDW & ANS Messages). If a GDW is issued or withdrawn, ANS messages will be distributed to authorised users registered with the service. The message will also be available within the ANS message area as illustrated below. To those who are not authorised users, National Grid offers a GDW subscription service which, if registered, means individuals will receive a free text/email informing them of any Gas Deficit Warning. To register for such updates, please click here.



Nominations Report

This report provides commercial Nomination data at defined times for Day Ahead Nominations at 17:00. Data is provided at total aggregate level for both entry and exit, at aggregated level per site type and for some site types it is also given at site level. Please note: any points not classed as relevant points under EU law are excluded from the site level data set.

- **Frequency:** Within Day at Re-nominations at 06:00, 12:00, 18:00, 24:00 and End of Day (EOD) Final at 06:00 D+1.
- **Source of Information:** Data is provided in the form of Nominations and entered into Gemini by the supplier.
- **Unit of Measure:** kWh/d
- **Location:** Report Explorer > Energy – Daily Reports > Pre Day – Within Day



3

After the Day (D+1)

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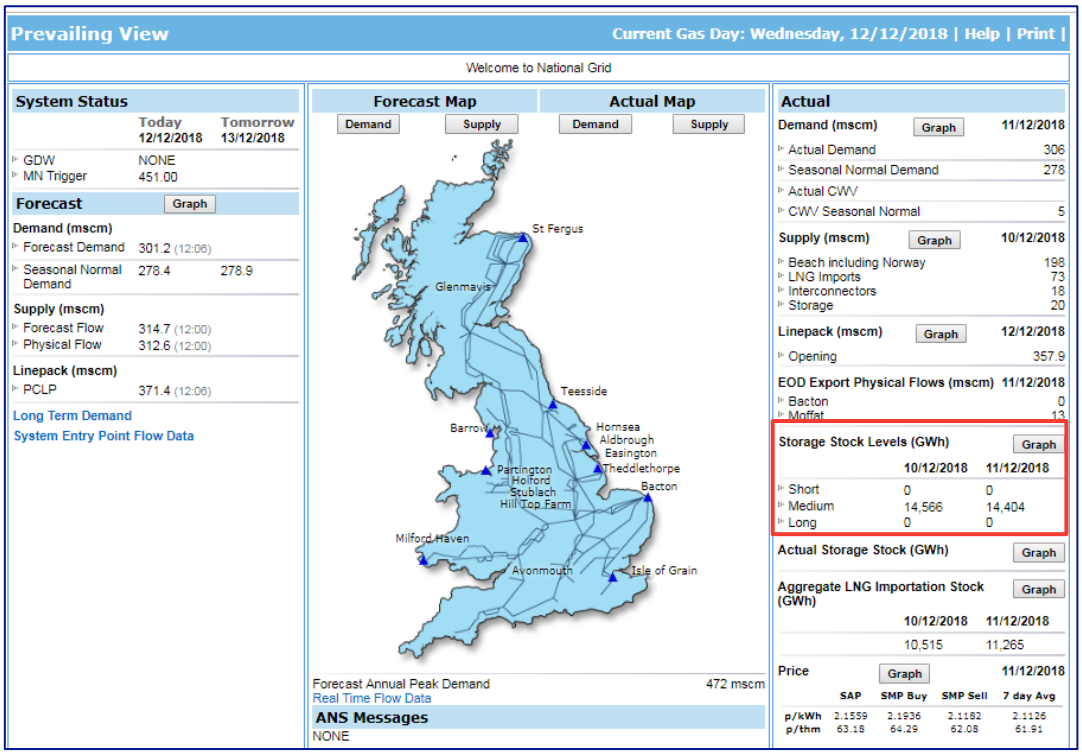
Supply

Storage Stock Levels

Aggregate stock levels for each storage site type. Please note that Short and Long storage stocks no longer exist and as such, we aim to have such fields removed going forward. There are however, multiple Medium range storage sites. These are commercially operated sites that have relatively short injection / withdrawal times, enabling them to be more responsive to changes in supply/demand.

- **Frequency:** Daily (16:00)
- **Source of Information:** This information is published on behalf of Storage Operators and uploaded by National Grid, as received.
- **Unit of Measure:** GWh
- **Location:** Prevailing View & for historic data, see: *Storage & LNG Report* in Report Explorer.

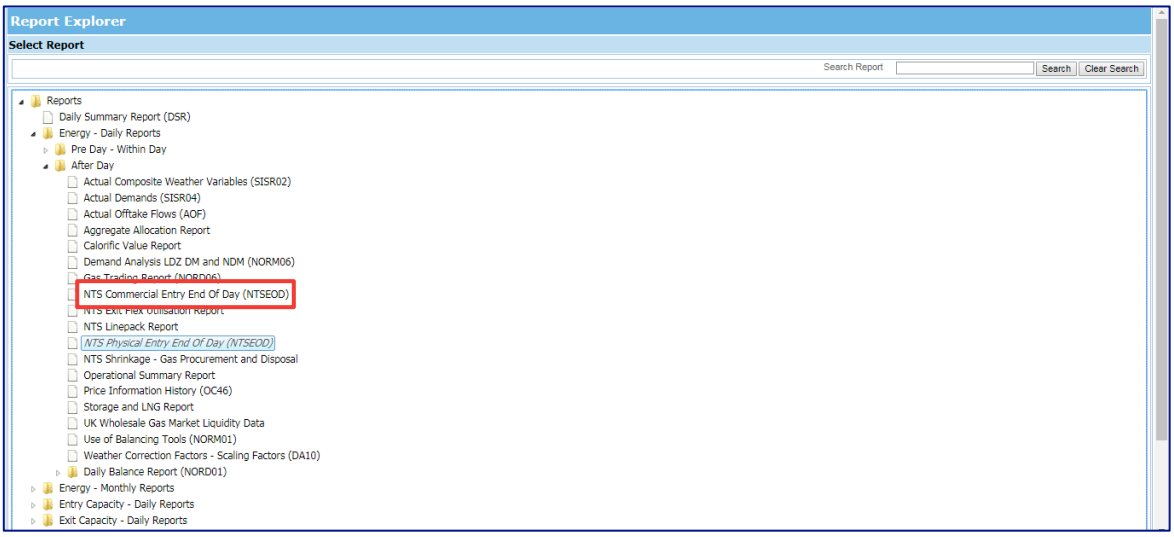


NTS Commercial Entry End of Day (NTSEOD)

This report provides information indicating the End of the Day (EOD) quantity of gas that has commercially flowed through an NTS system entry point on a specific gas day.

The report indicates aggregate commercial entry nominations onto the NTS but may not reflect the actual physical flow of gas.

- **Frequency:** Daily (12:00)
- **Unit of Measure:** GWh/d
- **Location:** Report Explorer > Reports > Energy – Daily Reports > After Day

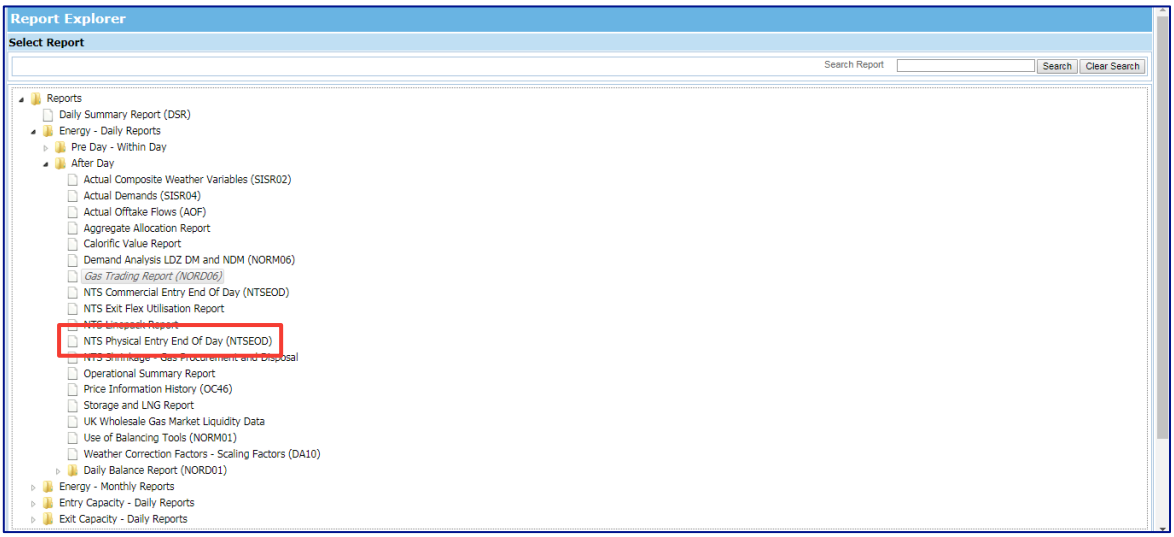


NTS Physical Entry End of Day (NTSEOD)

This report provides the physical System Entry Energy, System Entry Volume and Calorific Values for the corresponding system entries.

This report indicates aggregate physical entry nominations onto the NTS.

- **Frequency:** Daily
- **Unit of Measure:** System Entry Energy in kWh, System Entry Volume in mscm and System Entry Calorific Values in MJ/cm.
- **Location:** Report Explorer > Reports > Energy – Daily Reports > After Day

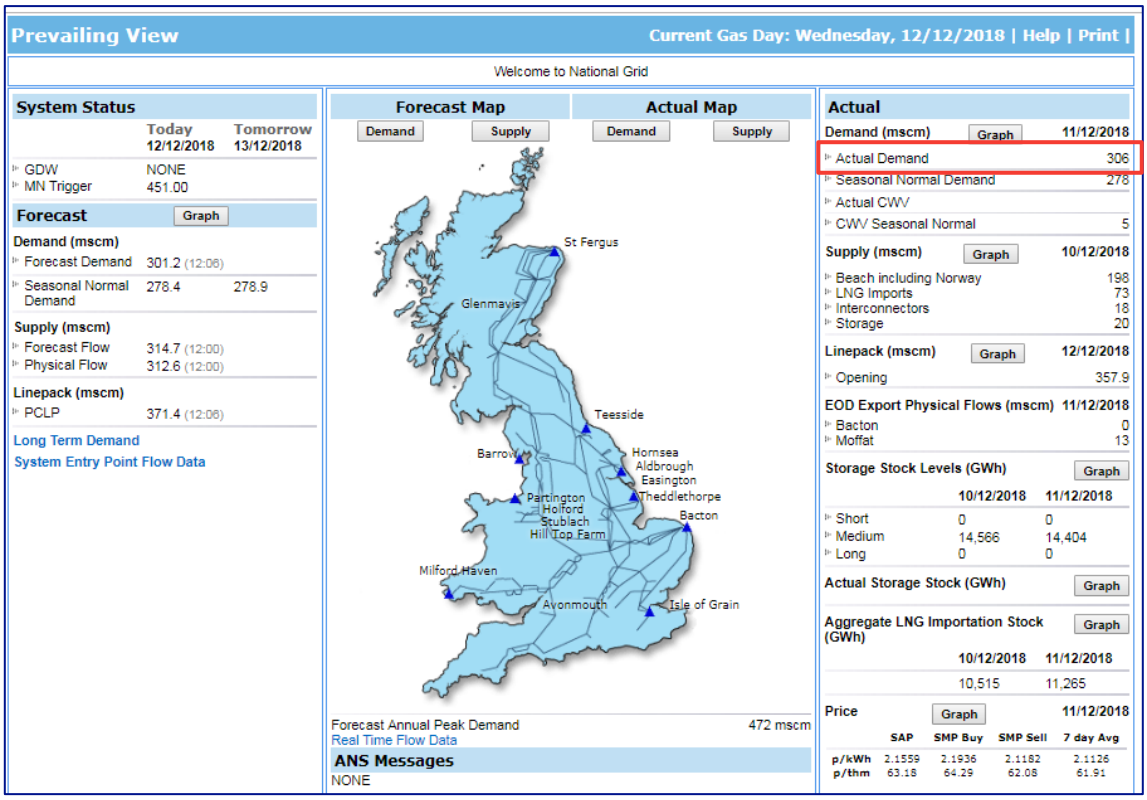


Demand

Actual Demand

Initial view of the amount of gas physically offtaken from the NTS for the previous gas day.

- **Frequency:** Daily (12:00)
- **Unit of Measure:** mscm
- **Location:** Prevailing View & for historic data, see: *Actual Demands* (SISR04) in Report Explorer.



The ***SISR04*** report, which can also be viewed via Report Explorer, has two sections.

The first section relates to the LDZ data which is provided by the distribution networks and is published by National Grid on their behalf. The LDZ data is the demand within the LDZ, which would have been supported by embedded supplies from the DNs, hence the LDZ demand data may not align with the LDZ offtake data (as described in the Actual Offtake Flows (AOF)).

The second section is NTS throughput and this is the physical demand taken off the NTS.

- **Methodology:** NTS Direct Load (interconnectors, storage sites, power stations and industrials) + LDZ Offtake Forecast + NTS Shrinkage Forecast.

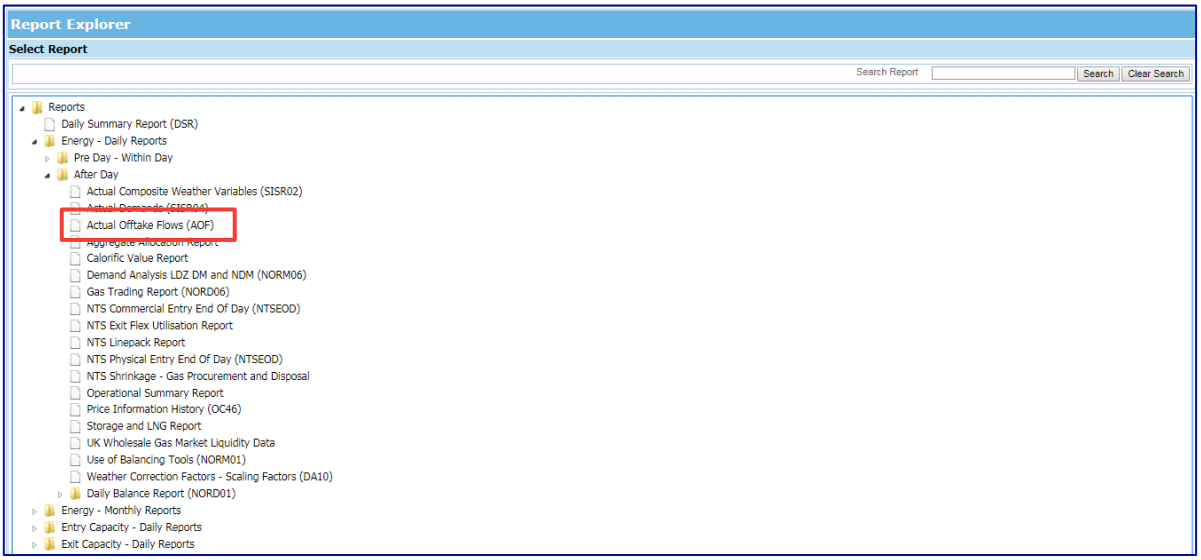
Actual Offtake Flows (AOF) Report

This report is for publication of the previous gas day's total physical demand on the NTS, by individual NTS exit points. This includes each individual demand for NTS connected sites, i.e. storage sites, power stations, interconnectors, industrials and distribution network offtakes.

Is the physical demand (NTS Direct Load (interconnectors, storage sites, power stations and industrials) + LDZ Offtake Forecast + NTS Shrinkage Forecast) that is taken off the NTS.

For more information on Actual Offtake Flows, please refer to the Operational Data – detailed queries webinar.

- **Frequency:** Daily (volume data 11:00 / CV 12:30)
- **Unit of Measure:** n/a
- **Location:** Report Explorer > Energy – Daily Reports > After Day

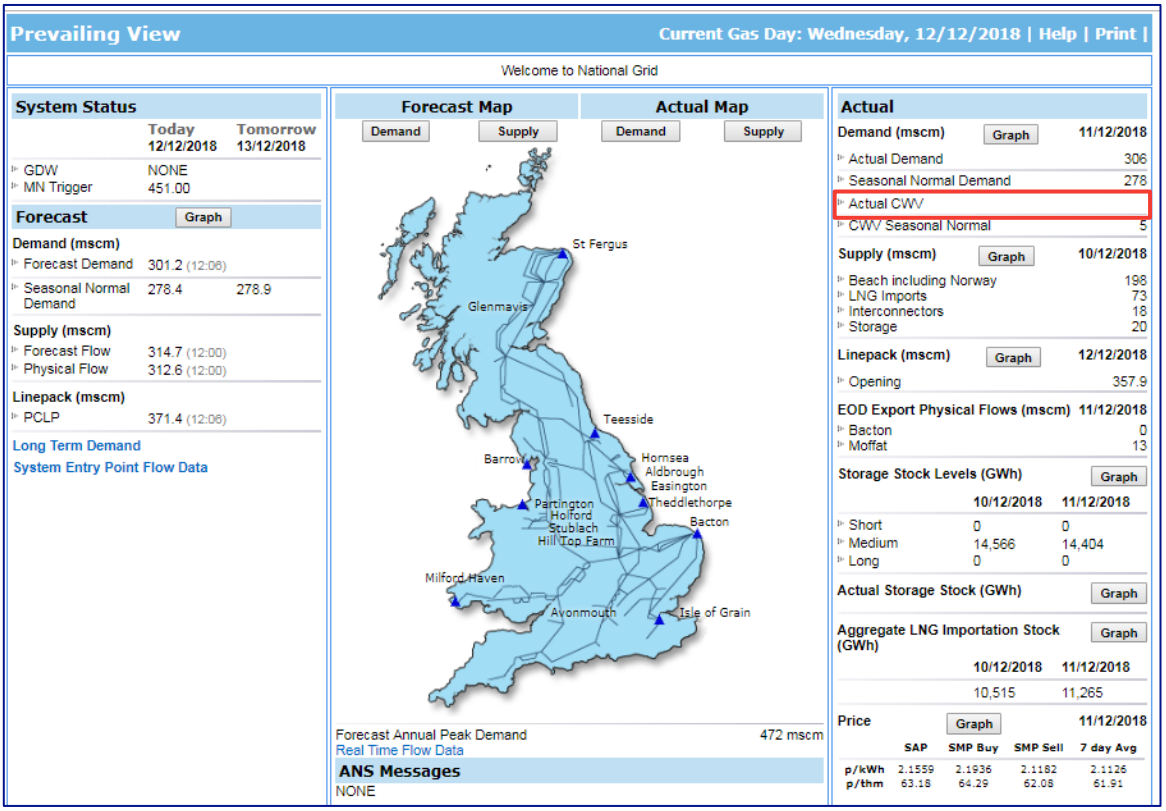


Other

Actual CWV

The Actual Composite Weather Variable (CWV) is relevant for the previous gas day and is a weather variable created from temperatures and wind speeds transformed to produce a linear relationship with gas demand.

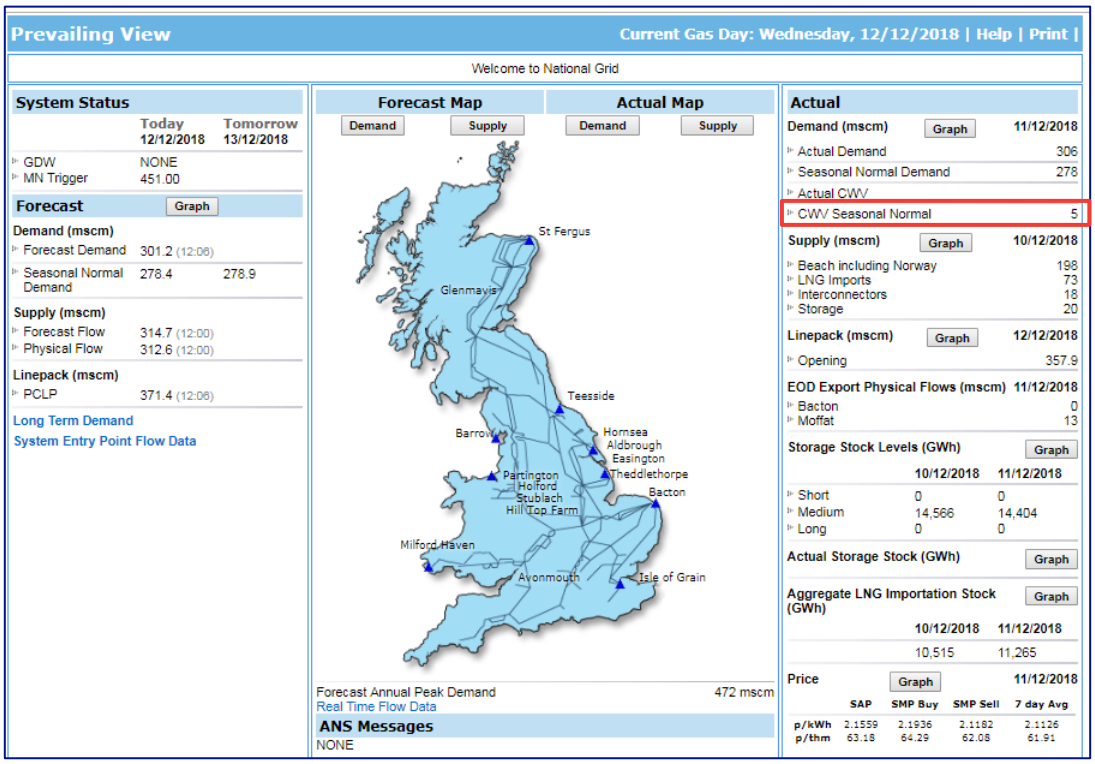
- **Frequency:** Daily at 13:30.
- **Location:** Prevailing View & for historic data, see: *Actual Composite Weather Variables* (SISR02) in Report Explorer.



CWV Seasonal Normal

The CWV Seasonal Normal acts as a seasonal comparison to the Actual CWV.

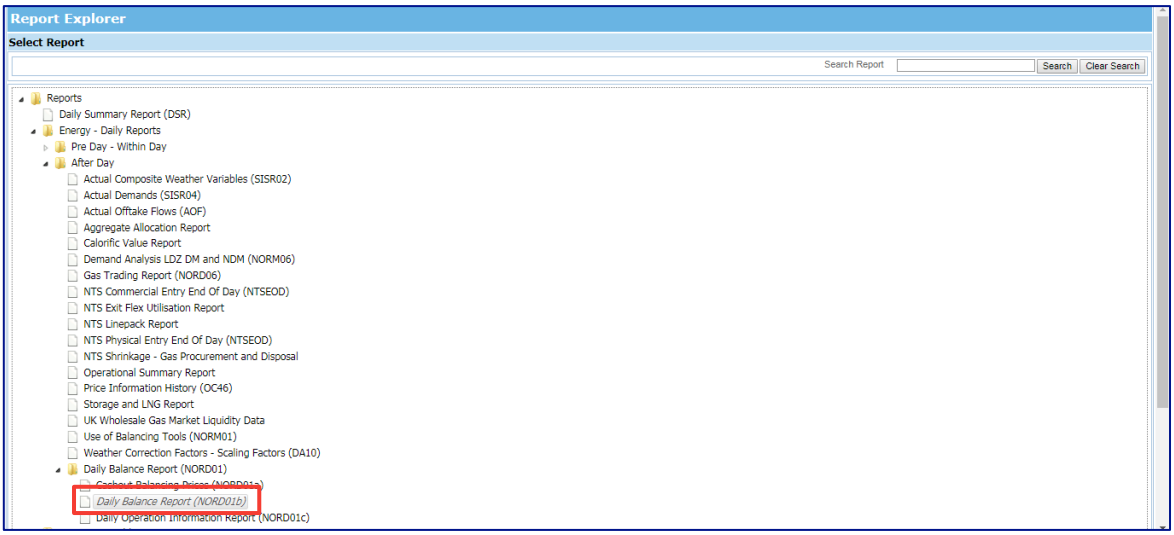
- **Frequency:** Daily at 13:30.
- **Location:** Prevailing View & for historic data, see: *Actual Demands* (SISR04) in Report Explorer.



Daily Balance Report (NORD01b)

This report shows the total nominated and actual inputs and outputs to/from the system; a summary of Balancing Actions taken by National Grid, Supply, Demand and Linepack details and a Price summary.

- **Frequency:** The nominations balance is updated at D+2, the Allocations balance is updated at D+7. All other information is updated at D+1. All updates are published at approximately 12:00.
- **Unit of Measure:** n/a
- **Location:** Report Explorer > Reports > Energy – Daily Reports > After Day > Daily Balance Report

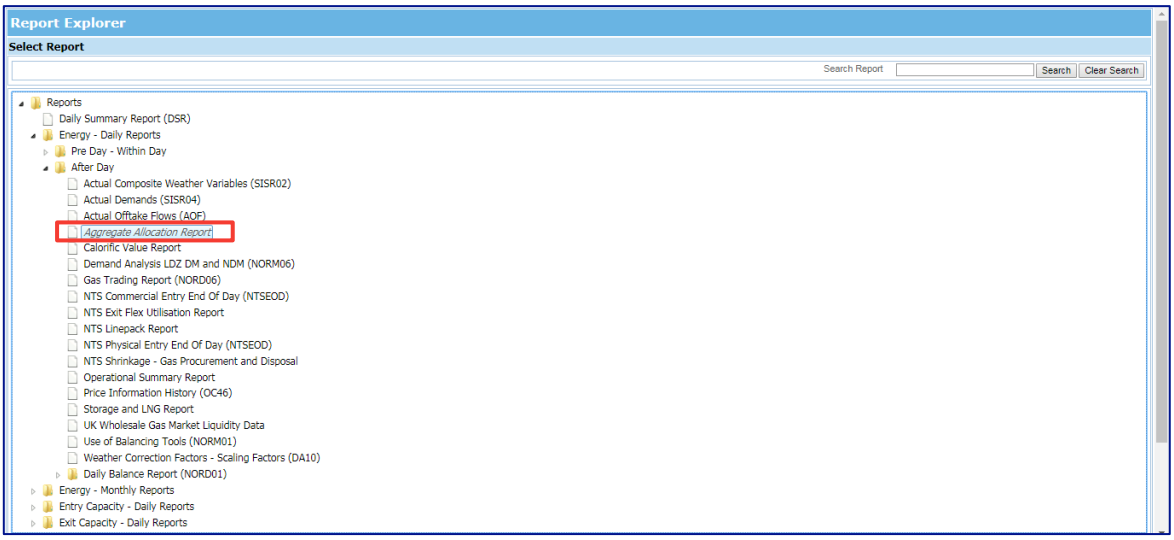


Aggregate Allocation Report

Aggregation is the process of splitting the actual gas flow for a meter among all the shippers associated with that meter.

The allocation report illustrates allocations aggregated by Entry and Exit and also by site type at D+2 and then updated at M+7 (7 days and a month after the gas day) for Exit data items and M+15 (15 days and a month after gas day) for Entry data items to show the Final Allocation.

- **Frequency:** Daily at 22:45
- **Unit of Measure:** kWh/d
- **Location:** Report Explorer > Reports > Energy – Daily Reports > After Day



4

Acronyms

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Acronym	Term	Definition
CWV	Composite Weather Variable	A single measure of daily weather. It is the combination of temperature and other weather variables, including wind speed. The purpose of CWV is to define a linear relationship between the weather and non-daily metered gas demand.
D		Data generated for a particular gas day during the gas day is classified by D.
D-		Data pertaining to gas days in the future are classified as D-x, where x is the number of days prior to the gas day the data is generated. For example, the earliest forecast of NTS Demand is generated five days before the gas day in question and is referred to as the D-5 forecast.
D+		Data generated for a particular gas day, after the gas day has occurring is classified as D+x, where x is the number of days after the gas day the data was generated.
DM	Daily Metered	Sites with meters which read on a daily basis. Readings provided via daily read equipment (DRE) and sent via telemetry. Class 1 sites are daily metered.
EOD	End of Day	End of the Gas Day (04:59).
GDW	Gas Deficit Warning	A GDW is given at National Grid discretion, based on expectations of the impact of a significant supply/demand event. A GDW will be issued in advance of or during a gas day if a significant supply/demand event is experienced which instigates a material risk to the physical end-of-day balance.
GMRS	Gas Market Reporting System	One of two publication services offered as part of MPI. It populates Instantaneous Flows.
kWh	Kilowatt Hour	
LDZ	Local Distribution Zone	A gas distribution zone connecting end users to the Gas National Transmission System. Operated by Distribution Companies
LNG	Liquefied Natural Gas	LNG is formed by chilling gas to -161oC so that it occupies 600 times less space than in its gaseous form. LNG terminals operate in the UK receiving supplies by ship and importing into the NTS.
MIPI	Market Information Provision Initiative	This forms part of the data which is provided on National Grid's Operational Data pages: https://www.nationalgridgas.com/data-and-operations/transmission-operational-data

MN	Margins Notice	An MN is information provided to all NTS users, indicating a potential supply/demand imbalance for the coming gas day. An MN is issued from 13:00 D-1, following an assessment of the expected available supply level against forecast total system demand. If demand is greater than supply (by any value), an MN will be issued via ANS. See also DMN.
MSCM	Million Squared Cubic Meters	
NSS	Non-Storage Supply	Gas that comes from sources other than gas storage. This includes supply from the UK Continental Shelf (UKCS), Norwegian imports, European imports and imports of liquefied gas (LNG).
NTS	National Transmission System	A high-pressure gas transportation system consisting of compressor stations, pipelines, multijunction sites and offtakes NTS pipelines transport gas from terminals to NTS offtakes and are designed to operate up to pressure of 94 bar(g)
OPNs	Offtake Profile Notices	A commercial tool used to make short term access to system flexibility available to users, over and above contractual rights.
PCLP	Predicted Closing Linepack	By assessing the predicted inputs and offtakes we can determine whether the system is likely to be within the acceptable operational range of 'balance' throughout the Gas Day. We publish a predicted closing linepack (PCLP) at regular intervals during a Gas Day based on the information we receive from industry parties.
SO	System Operator	The department of National Grid which manages the real-time operation of our networks. Transmission operator (TO) is a separate department which manages our assets. Operational Forum is organised by SO.
UIG	Unidentified Gas	An amount of Gas which could not be attributed to any system user. As only a minority of supply points submit daily reads into the allocation process, the remainder of gas is allocated based on estimates and historic data. Xoserve aims to support customers to understand and manage UIG further https://www.xoserve.com/index.php/unidentified-gas-uig/
UNC	Uniform Network Code	The Uniform Network Code is the legal and commercial framework that governs the arrangements between the Gas Transporters and Shippers operating in the UK gas market. The UNC comprises different documents including the Transportation Document (TPD) and Offtake Arrangements document (OAD). You can find all of these documents on Joint office: https://www.gasgovernance.co.uk/

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