



UAGCVS Report

November 2023



Executive Summary

This report provides a review of National Gas Transmission (NGT) Unaccounted for Gas (UAG) management since April 2013, the start of the RIIO-T1 price control, with particular emphasis on 1st April 2023 to 30th September 2023 inclusive, the period since the publication of the May 2023 UAGCVS report.

This report also contains our Calorific Value Shrinkage (CVS) statement with an overview of its possible causes. The publication of this report discharges NGT obligations under the Gas Transporter Licence Part J of Special Condition 5.6 (System operator external incentives, revenues and costs) – requirement to undertake work to investigate the causes of UAG and CVS.

The total assessed pre reconciled UAG quantity for the 1st of April 2022 to 30th September 2023 period is less than the previous six-month period. Monthly assessed pre reconciled UAG is also less than the long-term average (April 2013 to September 2023) for all the last 6 months. Although lower UAG aligns to historical summer throughput trends, the quantity of negative UAG is not typical behaviour.

NGT continue to improve its understanding of the causes of UAG through the use of data visualisation tools and investigative projects.

CV Shrinkage has increased when compared to the same months in the previous year. CV Capping has continued to contribute towards the increase which has predominately been witnessed in NE LDZ.

Continued support from meter owners has enabled NGT to obtain and review meter validation information for NTS entry and exit facilities. This data is being used to support the identification of causes of UAG, to enhance NGT's ability to detect meter error and to inform the preparation of future meter witnessing programmes.

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Unaccounted for Gas & Calorific Value Shrinkage Report – November 2023

Introduction

This report provides a review of National Gas Transmission's (NGT) UAG and CVS management.

The report provides information on assessed UAG quantities since April 2013, the start of the RIIO-T1 price control, with particular emphasis on 1st April to 30th September 2023 inclusive, the period since the publication of the May 2023 UAG report. It describes NGT's endeavours to undertake projects for the purposes of investigating the causes of UAG and CVS.

UAG, CVS and OUG (Own Use Gas) are the three components of NTS Shrinkage. Further information on the components of NTS Shrinkage can be found via the following link:

[NGT - UAG Management](#)

To compliment this report, NGT also provides a range of UAG related data including:

- previous UAG reports and UAGCVS reports
- daily data on the components of NTS Shrinkage

which are available on the National Gas Transmission website via the above link.

For additional information on the components of Shrinkage, please refer to the following link:

[NGT - Shrinkage](#)

The publication of this report and associated backing data discharges NGT's obligations under the Gas Transporter Licence Part J of Special Condition 5.6 (System operator external incentives, revenues and costs) - Requirement to undertake work to investigate the causes of UAG and CVS. Part J of Special Licence Condition 5.6 – requirement to undertake work to investigate the causes of UAG and CVS which is detailed in Appendix I of the report.

If you have any feedback or questions on this document, please contact NGT's Meter Assurance team via the following email address: meterassurance@nationalgrid.com

The Meter Assurance Team are part of the Energy Balancing team within NGT and are responsible for investigating the causes of and reporting upon UAG and CVS.

National Transmission System Unaccounted for Gas Trends

This section of the report provides information on assessed UAG quantities since April 2013, with particular emphasis on the period 1st April to 30th September 2023.

Unless stated otherwise, all UAG values are Pre-Reconciliation UAG. Pre-Reconciliation UAG is the value which is recorded after entry and exit closeout. This data shows the position prior to any reconciliations taking place.

Formula Years 2013/14 to 2023/24

Figure 1 provides the annual assessed UAG, OUG and CVS quantities for Formula Years 2013/14 to 2023/24 (so far). A Formula Year refers to the period from 1st April to 31st March of the following year.

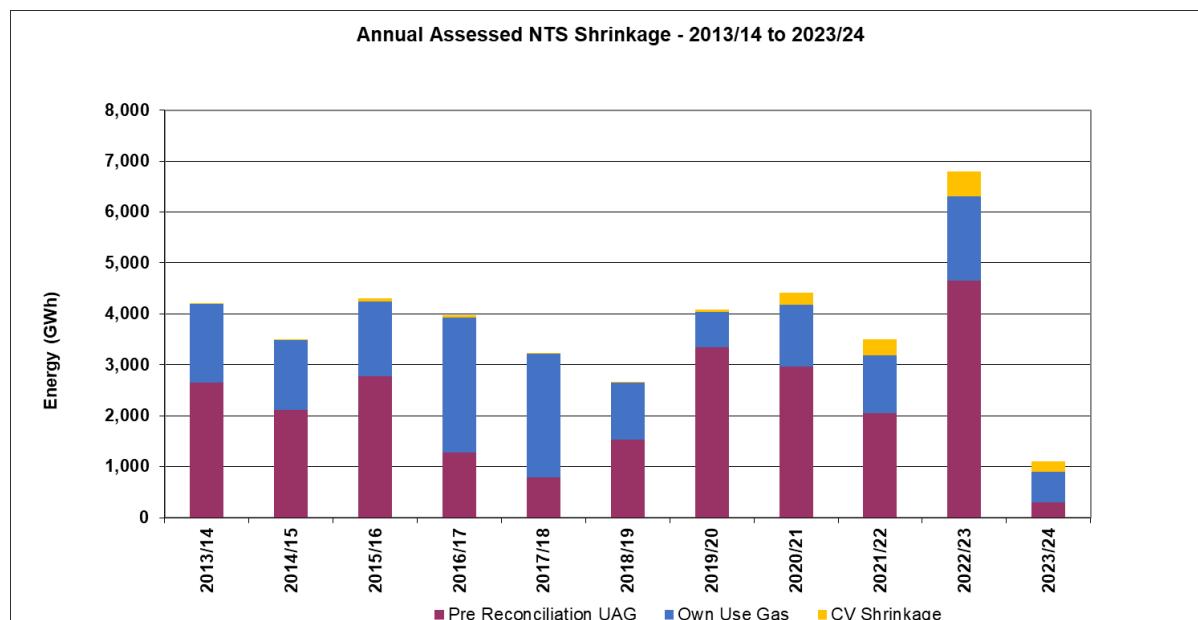


Figure 1: Annual assessed NTS Shrinkage – 2013/14 to 2023/24

Figure 1 demonstrates that for Formula Year 2023/24 so far, NTS Shrinkage is lower than previous years. A Distribution Network meter at Thornton Curtis Offtake (EA LDZ), under registered by 838 GWh, impacting UAG in 2022/23. The error was reconciled this summer. OUG is currently the predominant Shrinkage component, making up around 55% of NTS Shrinkage, UAG makes up 28% and CVS 17%. CVS became more prominent over the last few years and the potential causes of this will be explored in more detail later in the report.

Figure 2 provides the summer period assessed UAG, OUG and CVS comprising of April to September data for each Formula Year.

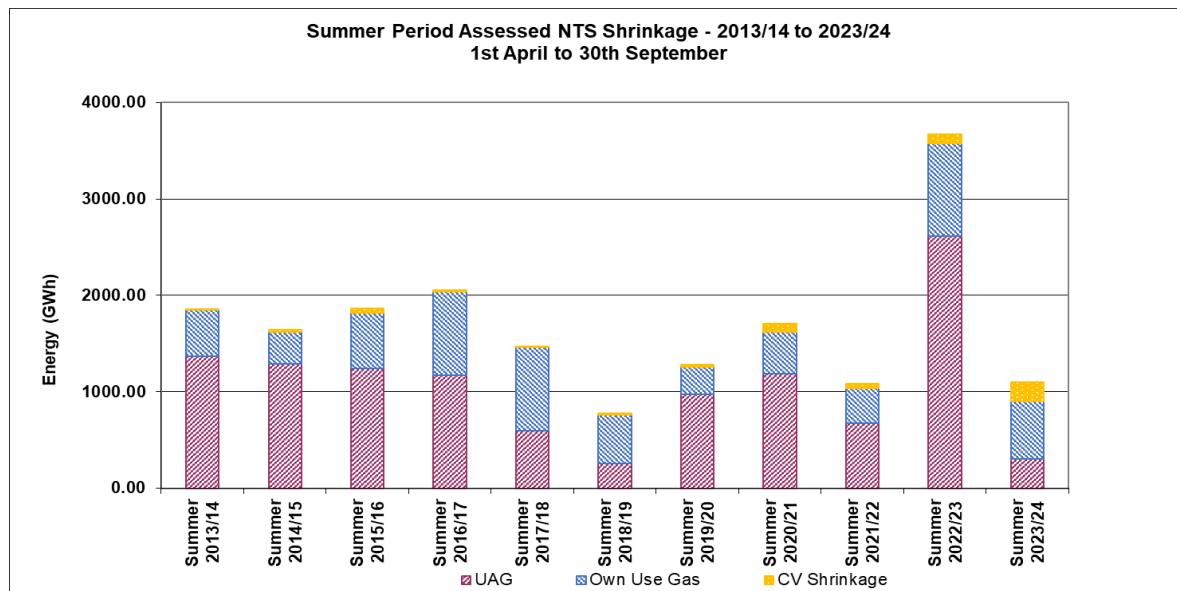


Figure 2: Summer Period Assessed NTS Shrinkage – 2013/14 to 2023/24

Figure 2 demonstrates that NTS Shrinkage throughout this summer period (April to September) has been lower than the previous period, although 2022/23 included the large Thornton Curtis error. UAG however has decreased when compared to the last four summer periods and has similarities to 2018/19 when UAG also had prolonged periods of negative UAG. OUG has also reduced to the last summer period although 2022 did see increased compressor usage due to the high demand of gas supply to Europe. CVS has increased by 101% when compared to the last summer period.

There have been fewer high UAG days this summer, which included 21 instances that exceeded the ± 20 GWh tolerance and 85 days witnessed negative UAG whereas 29 were observed last summer period. UAG accounts for 28% of total Shrinkage.

Total OUG quantities have decreased by 38% when compared to the previous year's summer period and accounts for 55% of total Shrinkage.

CVS accounts for 17% of total Shrinkage which has increased from previous years. Further information on CVS can be found in the CVS Statement within this report.

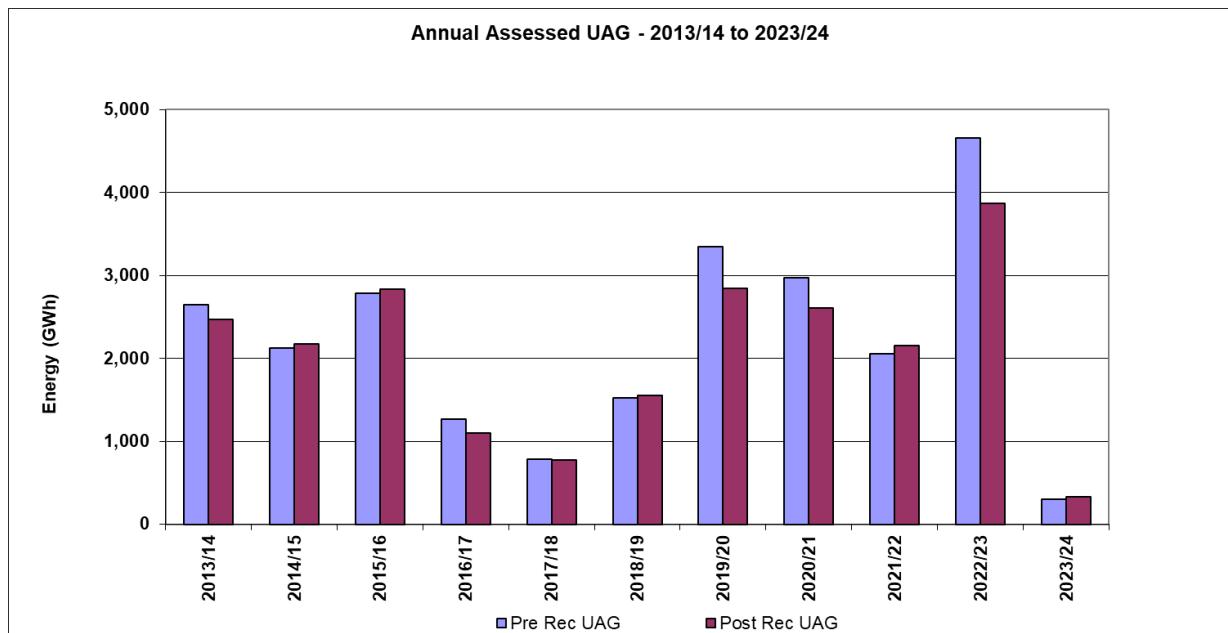


Figure 3: Annual assessed UAG – 2013/14 to 2023/24

Figure 3 represents both pre reconciliation and post reconciliation annual assessed UAG quantities for Formula Years 2013/14 to 2023/24. Pre reconciliation UAG is calculated using the energy measurements reported in the Gemini commercial system at closeout for the NTS entry and exit points. If a meter or data error is identified outside of entry and exit closeout for one of these points, the correct values are determined. Post reconciliation UAG is then calculated using the corrected values. Reconciliations impacting this year so far, have slightly increased UAG although the large meter error that was reconciled this summer has reduced Formula Year 2022/23. Further information on reconciliation is provided under section ‘UAG Management Activities’ of this report.

Table 1 provides the annual and daily average assessed UAG quantities for Formula Years 2013/14 to 2023/24. The table also provides the annual assessed UAG quantities as a percentage of annual NTS Throughput.

UAG	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24
Assessed Level (GWh)	2,648	2,121	2,782	1,272	783	1,528	3,342	2,972	2,051	4,659	302
Assessed Daily Average (GWh/d)	7.25	5.81	7.60	3.48	2.14	4.19	9.13	8.14	5.62	12.76	1.65
Percentage of NTS Throughput	0.30	0.24	0.30	0.13	0.08	0.17	0.36	0.32	0.23	0.45	0.09

Table 1: Annual Statistical performance of UAG - 2013/14 to 2023/24

The values provided in Table 1 indicate that annual assessed UAG, assessed daily average UAG and percentage of annual throughput in 2023/24 are lower than the previous years, although 2023/24 only includes 6 months of data.

With exception to last summer, where there was a large meter error identified and higher throughput due to increased supplies to Europe, UAG is again following patterns of lower UAG in summer months.

Figure 4 shows the total monthly assessed UAG from April 2013 to September 2023. It also provides the average monthly assessed UAG for this Formula Year so far (50.40 GWh) represented as the horizontal black line, together with the long-term average assessed UAG for the entire period (194.13 GWh) depicted as a horizontal red line.

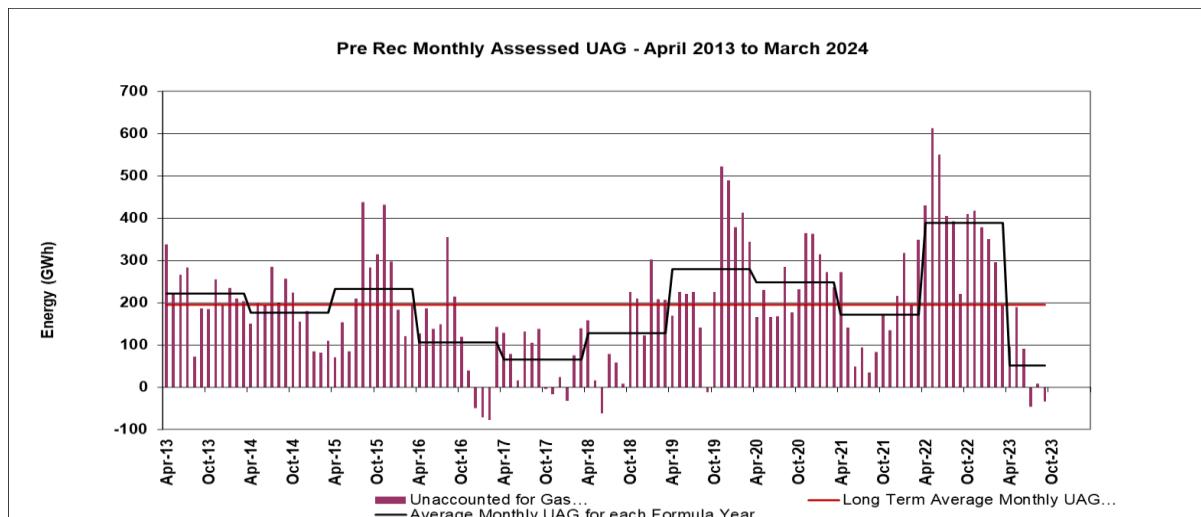


Figure 4: Monthly assessed UAG - April 2013 to March 2024

Throughout 2023/24 so far, three of the 6 months are above the Monthly Average (April, May & June) and none of the 6 months are above the Long Term Monthly Average UAG.

Figure 5 provides the total monthly assessed UAG between April 2023 and September 2023, compared with the equivalent months within 2022.

UAG over this summer period equates to 302 GWh, which is 2,309 GWh (88%) lower than last year's summer period, although a large meter error of 838 GWh was identified over the summer last year.

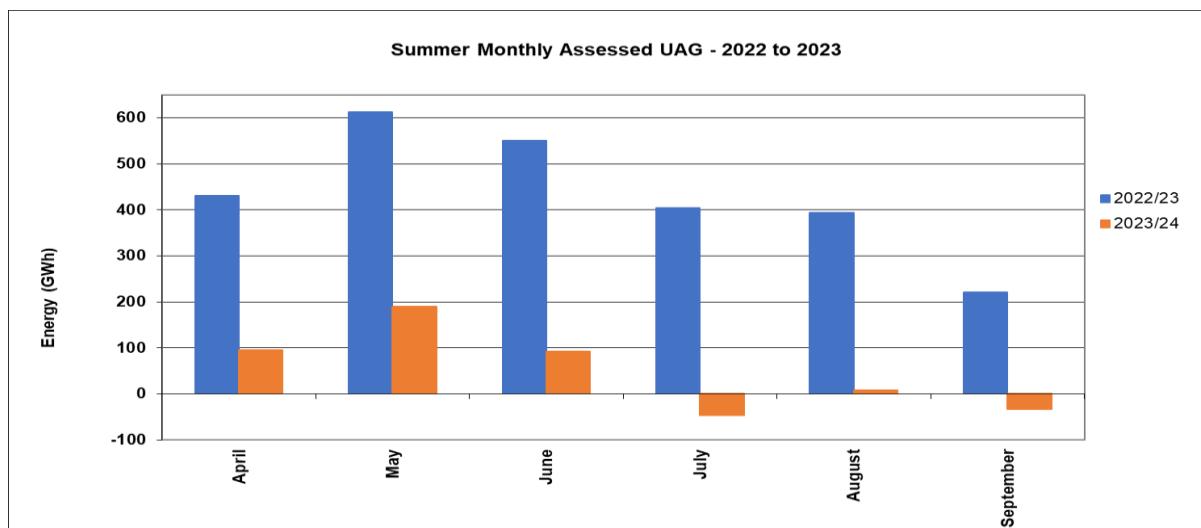


Figure 5: Summer Monthly Assessed UAG – April to September 2022/23 and April to September 2023/24

As seen in Figure 5 during the last six months, the total monthly assessed UAG varied from -46.86 GWh to +190.13 GWh, with a monthly average of 50.40 GWh. These values are lower when compared to the same months in the previous year. During April to September 2022, total monthly assessed UAG varied from +220.29 GWh to +612.30 GWh with a higher monthly average of 435.22 GWh.

Figure 6 shows the daily assessed UAG values for the period between 1st April 2023 and September 2023 and indicates that UAG has been outside ± 20 GWh for 11% of that time. Volatility between days has been observed and is depicted by a fluctuation of positive and negative UAG throughout the period, creating a near net effect to the latter part of the rolling average.

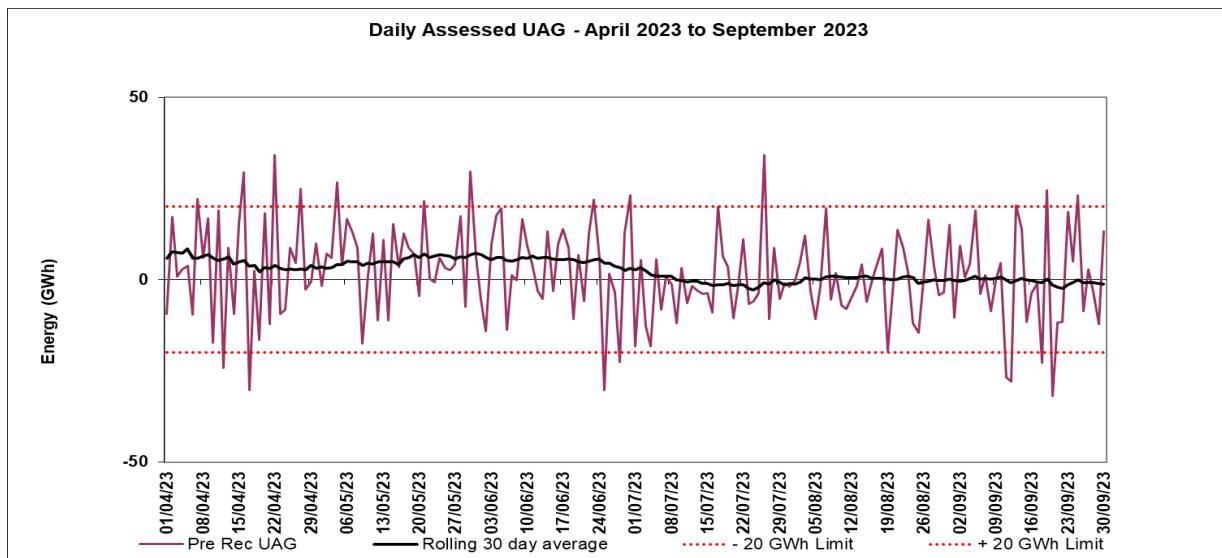


Figure 6: Summer Daily assessed UAG – April 2023 to September 2023

NGT reviews and investigates the assessed UAG values on a daily basis paying particular attention to any values that exceed ± 20 GWh. These baseline UAG quantities are provided as red dotted lines in the above figure. During the period of April to September 2023 there were 21 days when daily assessed UAG exceeded ± 20 GWh, 51 days less than the same period in 2022.

Whilst all high UAG days have been investigated for this period, we have not yet identified the causation of the low UAG trend.

Figure 7 outlines the demand breakdown with UAG overlaid for the period between April 2018 to September 2023. Interconnector Export volumes have decreased by 12% when compared to the last 6 months (October 2022 to March 23), there has also been a 38% decrease in export flows when compared to April to September 2022. LDZ Oftakes continue to display a seasonal pattern throughout, whereas Power Station demand demonstrates a more consistent annual offtake.

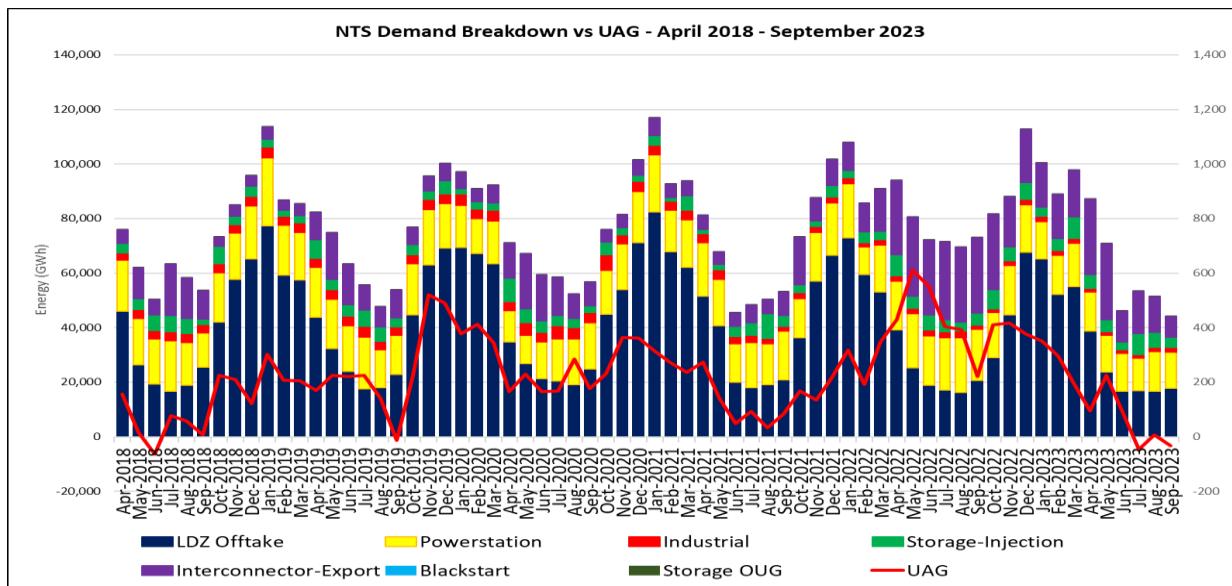


Figure 7: NTS demand breakdown – April 2018 to September 2023

Figure 8 below demonstrates a decrease in monthly Interconnector Export volumes across the summer months when compared to the previous year. Although April 2023 was slightly higher than the equivalent month last year. Since June, Interconnector exports have been aligned to flows prior to April 2022.

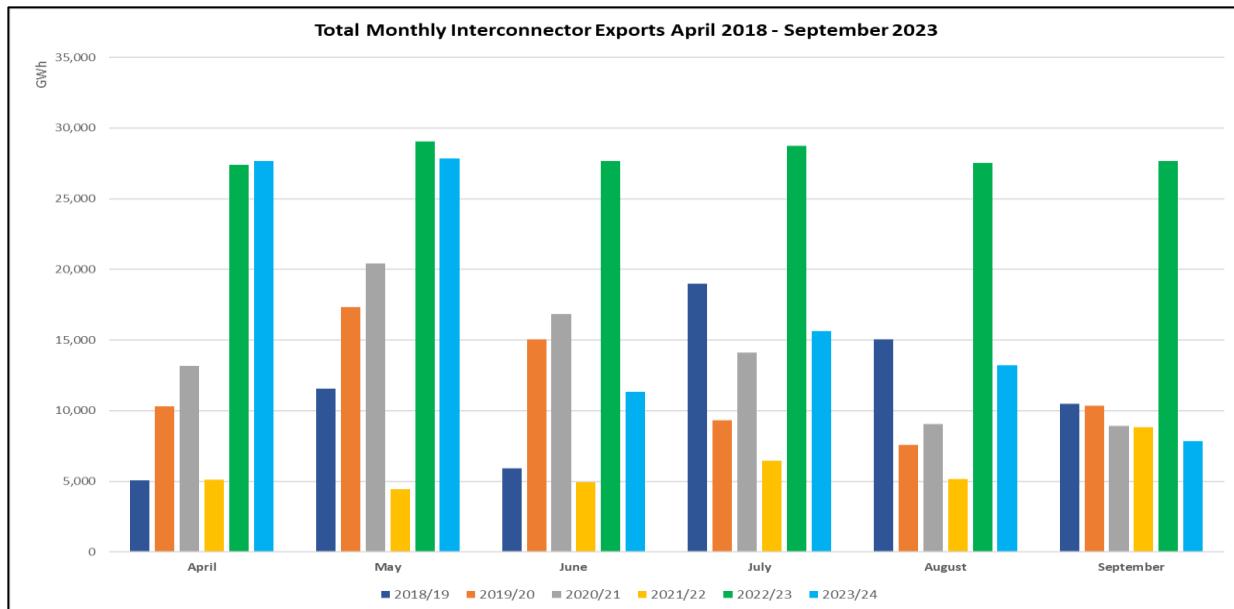


Figure 8: Interconnector Export April 2018 to September 2023

Figure 9 illustrates that Entry Terminals and LNG deliveries have continued with the seasonal patterns although increased LNG and Terminal flows were witnessed over the last summer period in line with the increased supplies to Europe.

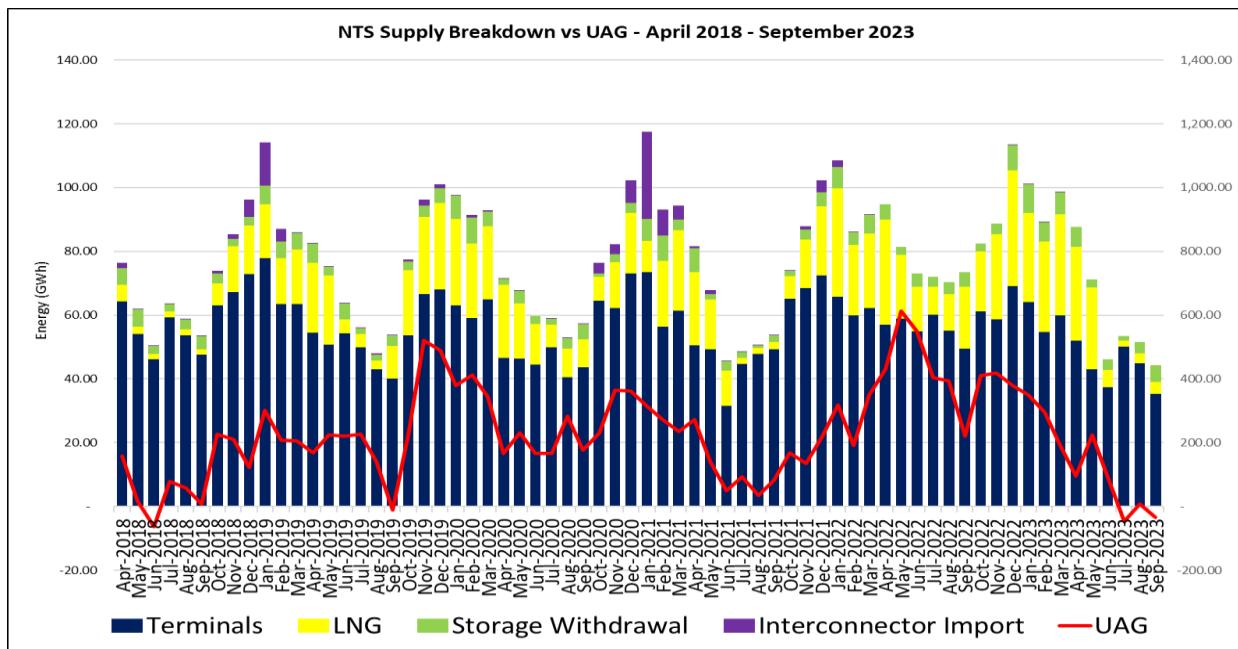


Figure 9: NTS supply breakdown – April 2018 to September 2023

Figure 10 provides the total LNG breakdown including South Hook and Dragon from Milford Haven in South Wales and both Isle of Grain Terminals in the South-East.

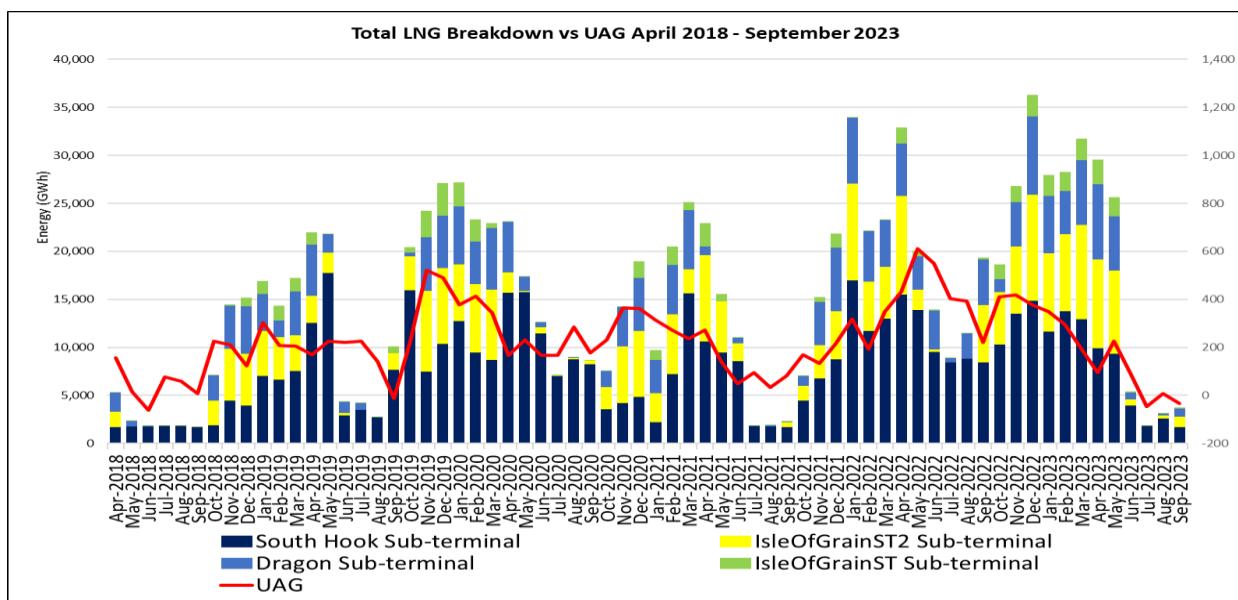


Figure 10: Total LNG breakdown – April 2018 to September 2023

As previously reported, UAG had increased and decreased with LNG flows but there has been no evidence to support that LNG flows are influencing this UAG behaviour.

Figure 11 below compares the total monthly LNG Imports since April 2018 over the summer months and highlights the change in flow patterns that have been observed.

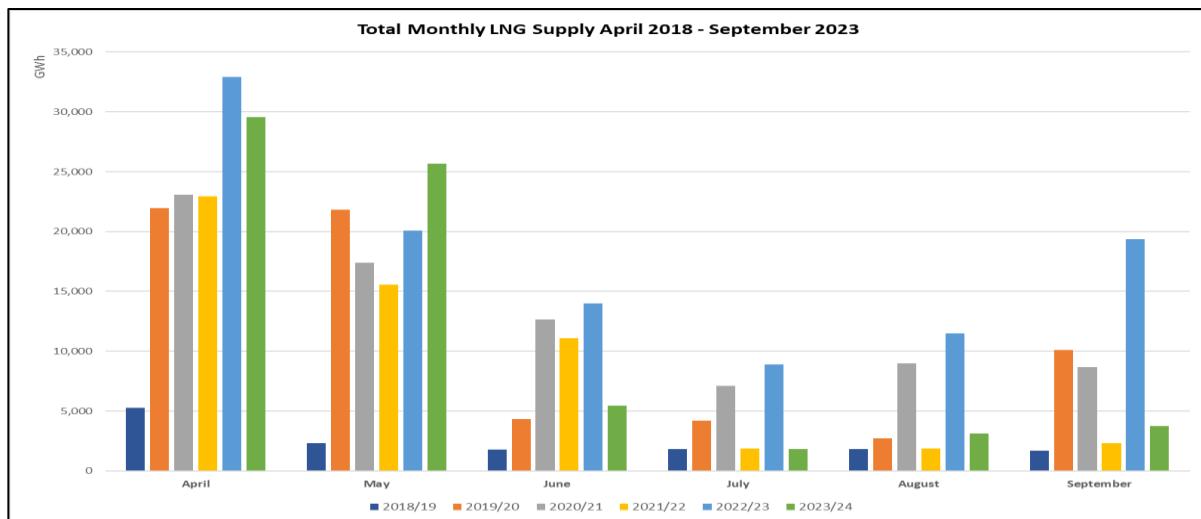


Figure 11: LNG Supply – April 2018 to March 2023

Figure 11 highlights that April 2023 saw the greatest levels of LNG delivered onto the NTS, followed by May 2023. Over the last 6 months, we have seen lower LNG quantities in 5 of those months when compared to the same months in the previous year.

Figure 12 displays the monthly net Interconnector position for BBL, Interconnector (UK) and Moffat over the period between April 2016 and September 2023. The positive values on the graph show the monthly net position being Interconnector gas imports and the negative values show the monthly net position value being Interconnector gas exports. This graph demonstrates that UAG has not previously followed a pattern to total net Interconnector activity, although Formula Years 2022/23 and Formula Year 2023/24, so far, UAG does show some reversed correlation to Net Interconnector throughput.

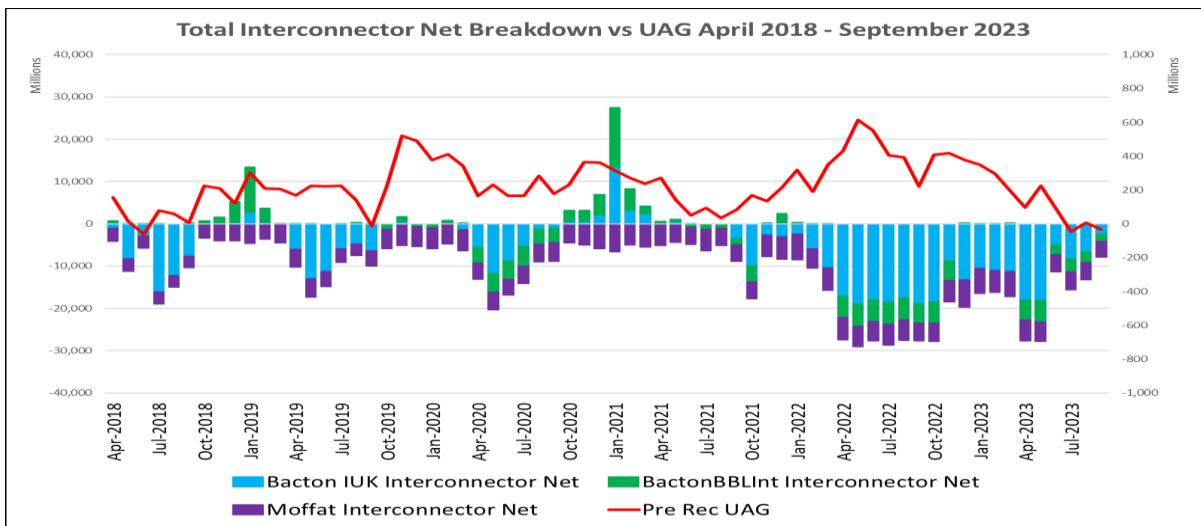


Figure 12: Net Interconnector – April 2016 to September 2023

Higher exports at Interconnector (UK) and BBL have been witnessed since April 2022, those flows have reduced since June 2023. Although a reverse correlation can be seen, investigations so far have been inconclusive. Further analysis will be carried out by NGT to further explore this.

UAG Management Activities

This section of the UAG report describes the various activities and initiatives that NGT has been undertaking or is planning to undertake to investigate the causes of UAG.

Meter Validation Report Reviews

Meter owners are obliged to undertake meter validations for each of their metering installations on at least an annual basis to confirm that the metering equipment is measuring correctly. The results of these tests are documented within a meter validation report and provided to NGT as soon as possible after the completion of the validation.

The validation reports provide essential information that allows NGT to assess the asset health and accuracy of the metering connected to its network. This enables a better understanding of the impact that meter error will have on assessed UAG.

For Formula Year 2023/24 NGT has so far received meter validation reports for 98 NTS entry and exit facilities, these reports are for validations that have taken place between April and September 2023.

From the validation reports that the Meter Assurance team have reviewed so far, NGT have raised queries where necessary with all relevant meter owners, to confirm if any instruments that tested outside of tolerance would have introduced measurement error, thus impacting assessed UAG levels.

The Meter Assurance team will continue to work with NTS Asset owners to review the Meter Validation Reports and close out any open actions that have arisen from the 2023/24 review period. The data provided and results recorded are used to develop the meter witnessing programme.

During meter validation tests, the metering system is required to be intercepted in order to simulate and record values which entails disconnecting or overwriting physical instruments, wires and software. There is a risk that meter error could be introduced through these activities. NGT is continuing to investigate the potential to identify assessed UAG when meter validations are known to be taking place.

NGT is focussing on validation tests that have the potential to cause measurement error, to gain a better understanding of different calibration equipment and different tolerances. The asset owners are assisting with our queries associated to these tests.

Meter Witnessing

The purpose of witnessing the validations is to gain assurance that the measurement equipment within the metering installation continues to measure the gas delivered to or taken from the NTS without bias and within the agreed measurement uncertainties.

Witnessing involves NGT personnel attending metering installations throughout the UK during meter validations to observe and document the testing taking place. Due to only a limited number of sites that met our site selection criteria, NGT have not yet witnessed any meter validations, but we continue to engage with NTS connected asset owners to arrange future visits in due course.

Reconciliation

NGT has an obligation to reconcile NTS related meter and data errors on behalf of the shipping community.

Over the last six months, since the publication of the May 2023 UAG Report, NGT has adjusted 1004.19 GWh in absolute energy terms via the reconciliation process. This comprises of 37 instances of reconciliation at individual NTS entry and exit facilities, each instance comprising of one or more days of reconciliation for a total of 555 gas days. Most of these reconciliations have been in Formula Year 2022/23; however, reconciliations have also been processed for 2020/21, 2021/22 and 2023/24.

Figure 16 provides the annual reconciliation quantities, in absolute energy terms, for 2013/14 to 2023/24. The orange portion of the bars indicate the reconciliation quantities processed since the publication of the May 2023 UAG report.

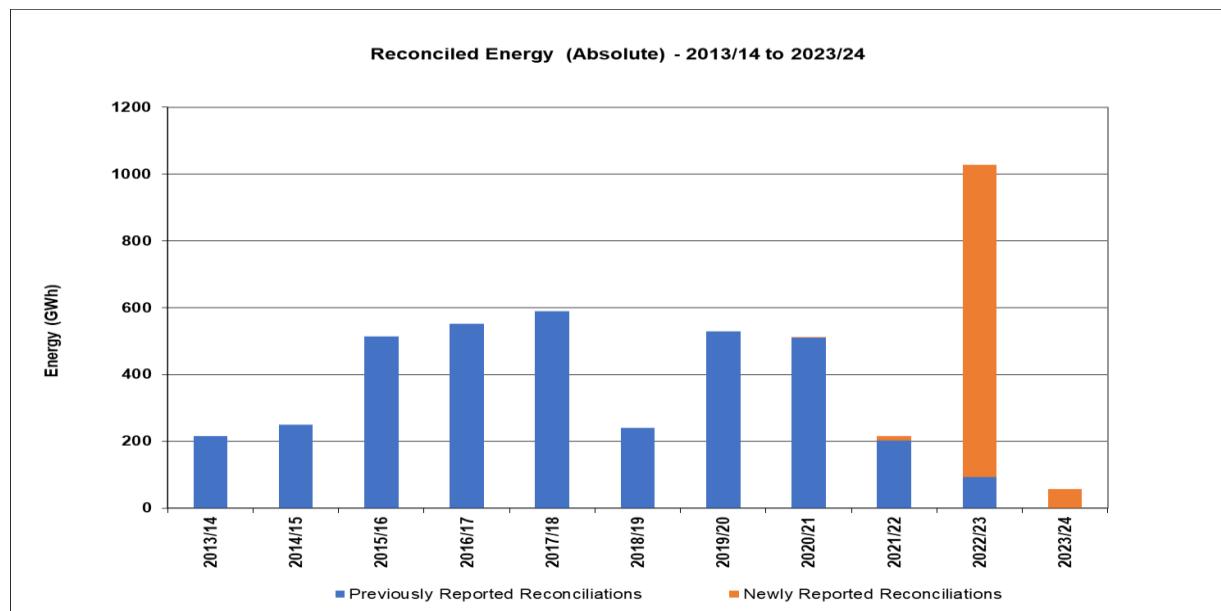


Figure 13: Reconciled energies (absolute) – 2013/14 to 2023/24

Of the 37 instances of reconciliation processed, 8 related to meter error and 29 related to data error.

Table 2 shows the number of instances of measurement error that have been reconciled since the May 2023 report and the total absolute energy (GWh) that has been adjusted in each formula year. Since the last report, a large meter error of 838 GWh has been reconciled for Thornton Curtis Offtake (EM LDZ) which impacted the gas days between April 2022 to July 2022.

Formula Year	2020/21	2021/22	2022/23	2023/24
No. Instances	1	10	23	3
Total Absolute GWh Reconciled	0.48	12.29	934.81	56.61

Table 2: Reconciliations

Figure 17 below shows absolute reconciled energy against Assessed UAG and reconciled energy as a percentage of UAG. Reconciliation on average, is around 20% of UAG, except for Formula years 2016/17 and 2017/18.

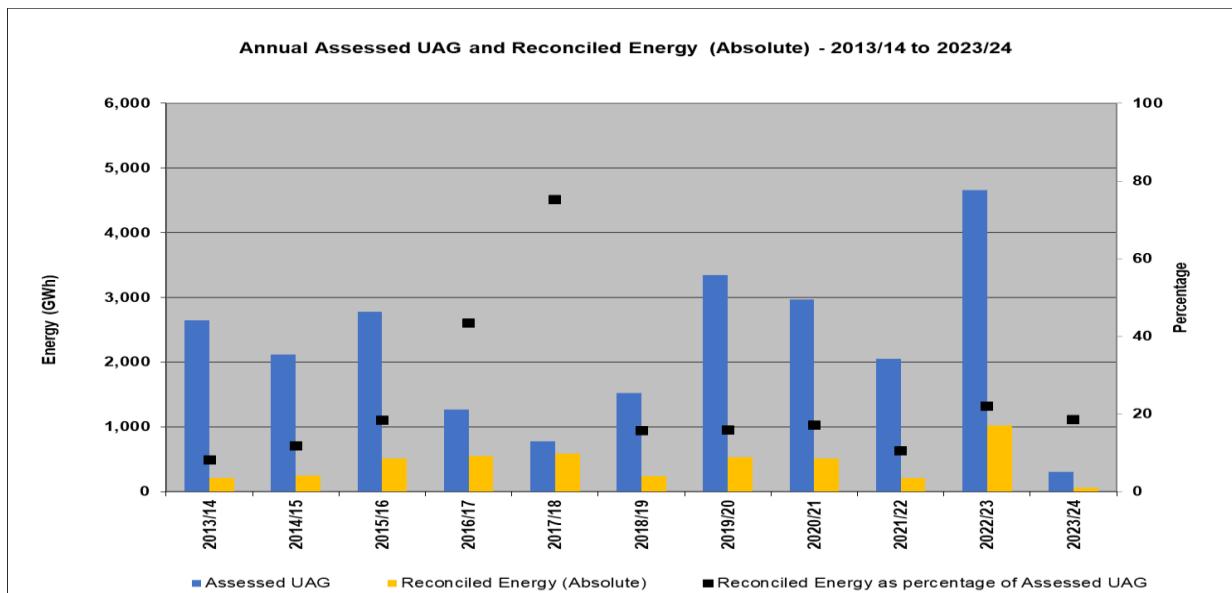


Figure 14: Annual Assessed UAG & Reconciled Energy (Absolute) – 2013/14 to 2023/24

Post reconciliation UAG has been applied to figure 18, this shows UAG between April 2019 to March 2022, align more to the values that were seen between 2013 & 2016. The Post Reconciliation UAG values in 2022/23 have decreased upon completion of the Thornton Curtis reconciliation but is still higher than previous years, indicating further unidentified meter error in that formula year.

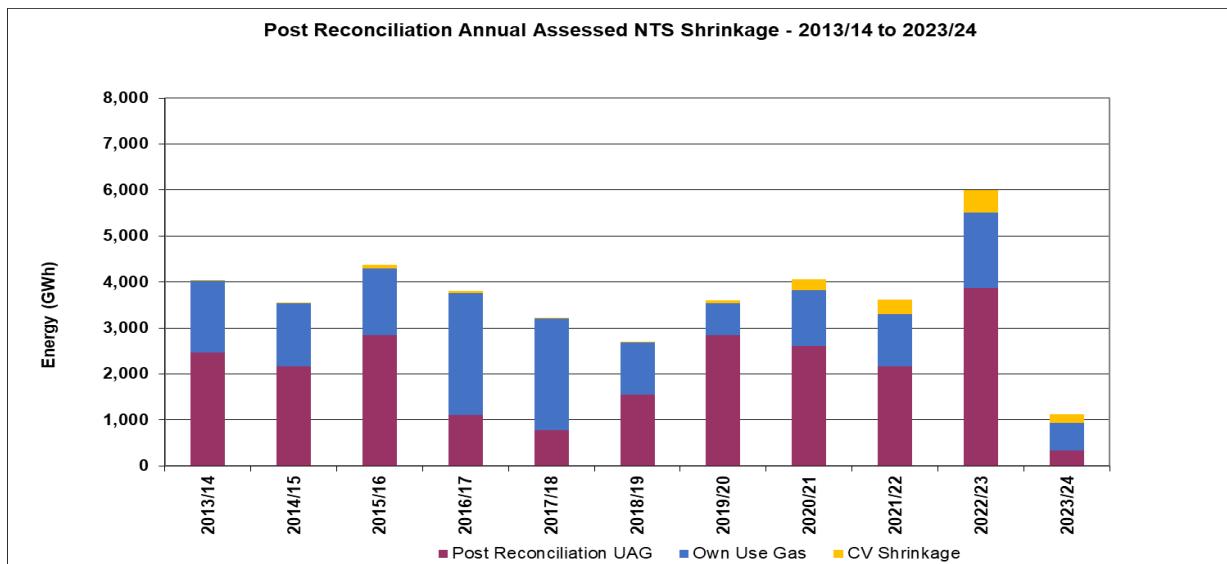


Figure 15: Post Reconciliation Annual Assessed NTS Shrinkage – 2013/14 to 2023/24

NGT progresses its validation of end of day measurements to help address data quality challenges experienced during the pre-closeout period. One initiative that automates the handling of Sub Terminal and Storage data into our systems and reducing the opportunity for manual input errors to occur is steadily increasing. Further Sub Terminals and Storage sites are being onboarded to this system later in the year. So far 15 sites are automated, NGT hopes that this can be rolled out to all NTS entry sites in the near future.

NGT is continuing to process meter and data error reconciliations which will be included in future reports.

UAG Investigation

NGT manage projects to investigate the causes of UAG. These projects include historical and future UAG patterns or trends.

NGT's continued ambition is to better understand end to end data flows to identify and mitigate systematic data error, to automate and validate all data points and build the tools to identify the sources of UAG.

Since the publication of the May 2023 UAGCVS Report various projects have been undertaken to investigate the current trend in low UAG and the high UAG trend that spanned April 2022 to March 2023. These investigations have helped to understand and ensure assurance in our data and by carrying out site elimination checks using flow profiles across all sites, we were able to rule out any obvious outliers.

The high UAG period between April and July 2022 reduced by approximately 10 GWh per day after the reconciliation for Thornton Curtis Offtake was invoiced, but other unidentified errors over this Formula Year may have attributed to this high UAG behaviour.

Projects specifically to look at the current low UAG trend have been carried out since the May 2023 UAGCVS report which are additional to the projects scoped in Table 3 below.

Flow Profiling:

Flow profiles for all sites connected to the NTS have been compared to UAG patterns over the last 3 Formula Years, 2021/22, 2022/23 & 2023/24. These 3 periods have seen expected Seasonal UAG Patterns (2021/22), High UAG Trends (2022/23) and Low UAG Trends (2023/24). The data displayed graphically enabled NGT to check if any site flows correlated to these UAG trends. The outcome displayed several outliers, which have been further analysed against other data sources such as telemetry and site notifications. Further investigation into similarities to Bacton Interconnector exports and Milford Haven import flows are still being carried out.

Top 60 Site Check:

60 individual sites with the largest throughput from April 2022 to March 2023 have been analysed against the total throughput of those 60 sites. These top 60 sites equate to over 75% of total NTS throughput and potentially could have the most impact on UAG if an error was introduced to the metering. Preliminary analysis was to compare flow trends to the expected flow patterns and identify any outliers. This investigation has identified that over half of the 60 sites require further investigation, some of the differences in trends may be due to maintenance periods, gas price and LDZ flow swapping.

Further analysis will enable these sites to be grouped into site types which may narrow down the investigation. The time periods will also be extended to incorporate when UAG trends have been low.

Offtake Demand Patterns v Total Demand:

This analysis is currently ongoing, it is to examine total demand patterns against Offtake demand over the last 3 Formula Years. The outcome of this investigation will feature in the next report.

Review of current daily amendment methodologies to ensure accurate data:

A review of the daily settlement processes has been carried out and the checks are now utilised as part of high UAG checks and any trend analysis.

Table 3 provides an overview of the UAG projects and initiatives NGT have planned over this Formula Year (2023/24). Other ‘mini projects’ (listed above) have also been undertaken that focus over this year’s low UAG trend.

Project / Initiative	Target Completion Date	UAG / CVS	OUTCOME
Enhancements to UAG Causality detection models	Future Project	UAG	Ongoing: NGT to resource necessary expertise and data access
Calculate UAG zonally across the NTS	Potential future project	UAG	On Hold: The possibilities of this have been discussed with Network modellers. Due to the amount of new data points required to do this, it would be out of scope for this reporting period. Cost benefit analysis will steer this as a future project.
Review of ± 20 GWh baseline tolerances	Future Project	UAG	Ongoing: The current trend in UAG has been adequately captured within the current baseline. This will roll over into the following period, especially if the current behaviour changes or settles.
LNG Gas Temperature – impact of temperature cooling as it leaves the Terminal. Scope would also include NTS compressors	Potential future project	UAG	Ongoing: This requires network modelling and expert determination to determine if there are impacts on volume within the Network.
Improvement to SCADA data calculations	2023/24 Project	UAG	Ongoing: Projects in this area are still ongoing that will reduce the requirement for manual entry and potential data errors that could cause UAG and require reconciliation.
Duplicate data investigation.	2023/24 Project	UAG	Ongoing: Duplicate volume and energy data has been identified in some of the data we receive from 3rd parties, this is currently being identified, although this phenomenon precedes this UAG trend so is unlikely to be a cause. Further information will be shared in future reports.
Improvement of data visualisation tools to assess site profiles against UAG behaviour.	2023/24 Project	UAG	Ongoing: Incorporate new data sets from the new data platform into our current data visualisation tools.
Improvement of CV Shrinkage data from Correla	2023/24 Project	CVS	Ongoing: A change request has enabled NG to access CV Shrinkage and capping data daily which will allow for NG to communicate with relevant parties in a timely manner with the aim of reducing CV Capping where possible.
Flow Profiling	2023/24 Project	UAG	Complete: See the detailed comments on previous page
Top 60 Sites	2023/24 Project	UAG	Ongoing: See the detailed comments on previous page
Offtake v Total Demand	2023/24 Project	UAG	Ongoing: See the detailed comments on previous page

Table 3: Project initiatives for Formula Year 2023/24

Resource in the data science arena has been limited due to other projects, a new data platform is also being developed that will enable access to raw data that has not been accessible before. The projects that are scoped in Table 3 will be scheduled in the coming months dependent on resource and data availability.

All closed out projects can be viewed in previous UAGCVS reports.



CVS Statement & Investigation

Calorific Value Shrinkage (CVS) is gas which cannot be billed due to the application of Gas (Calculation of Thermal Energy) Regulations 1996 (amended 1997) and is the Local Distribution Zone (LDZ) energy difference between measured and billed Calorific Value (CV).

The regulations outline that the daily CV average for a given charging area is calculated by summing the product of the CV and volume for all supply inputs and dividing by the total volume of gas entering the charging area.

The maximum daily CV average for a charging area permitted by the regulations is equal to 1.0 MJ/m³ above the lowest measured daily CV of the supply inputs into that charging area, meaning if for any given day an input into a charging area has a CV outside of this range, a capped CV (lowest CV + 1MJ/m³) will be applied to the whole region for billing purposes. This is to protect customers who may live near this supply of lower quality of gas and prevent them overpaying for the gas they are receiving.

To calculate CVS, NGT deduct the value that is used to bill downstream shippers based on the principles detailed above, from what was measured leaving the NTS by Ofgem approved equipment.

CVS occurs every day for all charging areas with more than one supply input into the region, this usually only equates to very small quantities if capping hasn't occurred and is a result of the charging area CV being rounded to one decimal place following its calculation. With CV capping being the major contributing factor to CVS, UNC Offtake Arrangement Document Section F 2.2 details that all parties cooperate with the view to avoid or minimise the amount of CVS each day.

With that in mind, if capping is caused by an NTS/LDZ offtake, NGT will investigate, and where possible, seek to minimise or avoid capping and will provide guidance to the Distribution Network Operator (DNO) to alter patterns of flow through the offtakes or alternatively look at solutions to alter flows within the NTS to improve blending of gases. If the capping is caused by a non-NTS connected asset that inputs gas into the LDZ, the DNO's may investigate the source.

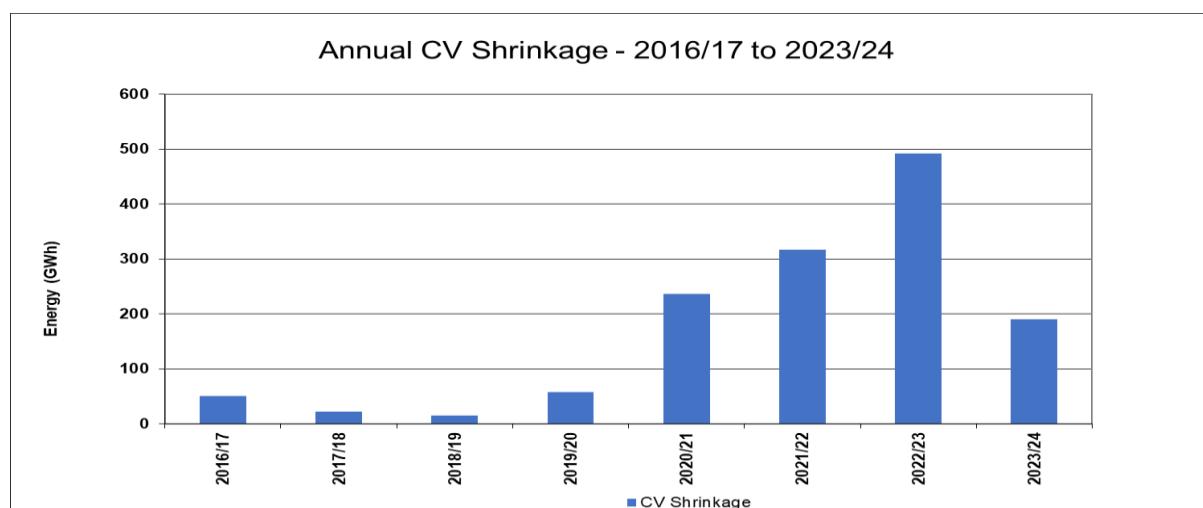


Figure 16 - Annual CV Shrinkage 2016/17 to 2023/24

Figure 16 provides a view of CV Shrinkage between 2016 and 2023. So far, CV Shrinkage in 2023/24 is 61% lower compared to the previous full year, however, when compared to the same 6 months in 2022, CV Shrinkage has increased by 101%.

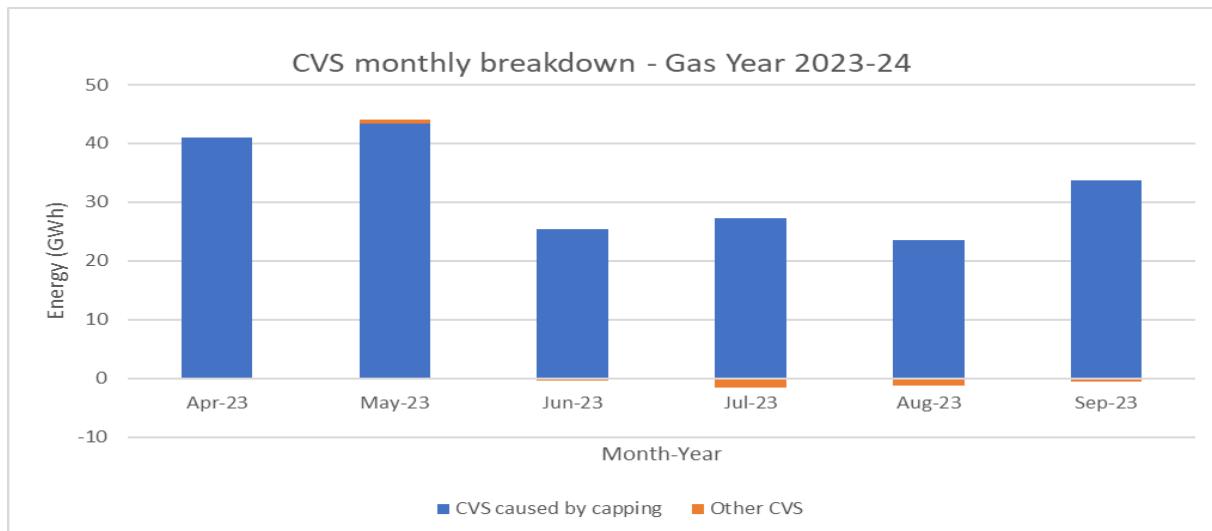


Figure 17 - CVS Monthly Breakdown 2023/24

Figure 17 provides a monthly breakdown of CV Shrinkage for 2023/24. This shows the proportion of CVS due to CV Capping detailed (in blue) and the remainder of other CVS (in orange), which can be either positive or negative when not caused by CV capping. This is due to the rounding of the LDZ CVS to 1 decimal place, as previously mentioned.

Throughout the last six months, CV capping has equated to 194.38 GWh with capping occurring in 12 of the 13 LDZs. The impacted LDZs are EA, EM, NE, NO, NT, NW, SC, SE, SO, SW, WM and WS with higher volumes of capping throughout April to September as seen in Table 4.

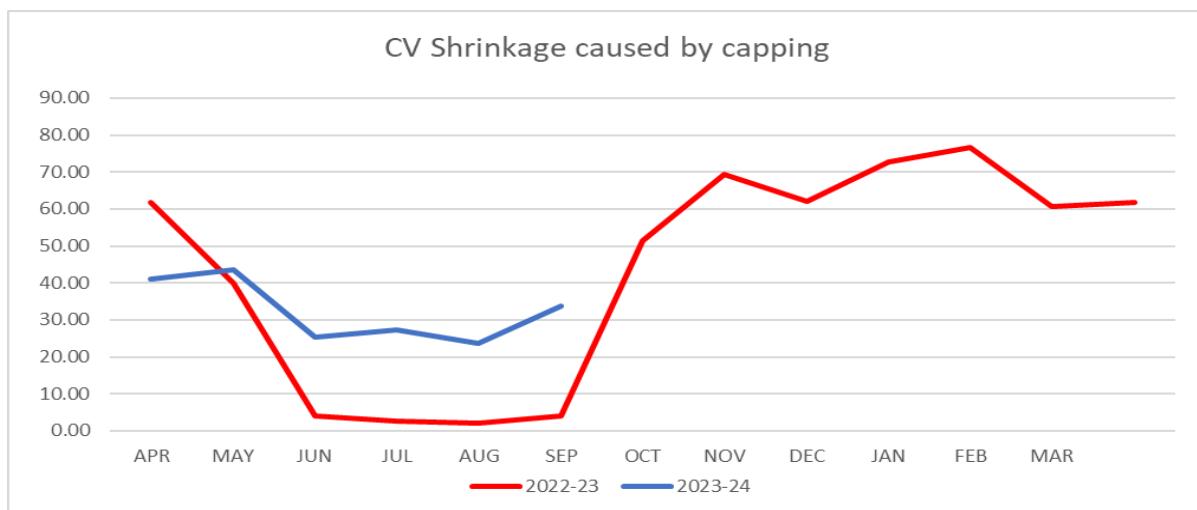


Figure 18 CV Shrinkage caused by capping 2022/23 v 2023/24

Figure 18 shows that CV Shrinkage caused by capping is trending higher in this formula year compared to the same months in the previous year.

CV capping in Formula Year 2023/24 so far has 337 instances of CV capping and 55% of total capped energy was seen in NE LDZ.

Month	CVS caused by Capping (GWh)													Total
	EA	EM	NE	NO	NT	NW	SC	SE	SO	SW	WM	WN	WS	
Apr-23	0.00	1.88	31.72	5.59	0.00	0.00	0.62	0.00	0.00	0.00	1.18	0.00	0.00	40.98
May-23	0.00	3.48	34.71	4.32	0.00	0.00	0.55	0.00	0.00	0.00	0.40	0.00	0.00	43.45
Jun-23	1.11	0.69	16.25	0.82	2.93	0.00	0.00	0.00	0.34	0.00	3.29	0.00	0.00	25.45
Jul-23	1.57	4.41	10.69	0.00	0.00	0.00	3.18	0.00	0.00	7.36	0.00	0.00	0.00	27.21
Aug-23	0.04	1.53	9.74	4.46	0.00	2.58	0.00	0.00	0.00	4.19	1.05	0.00	0.00	23.59
Sep-23	2.84	6.00	7.98	4.65	0.00	0.00	0.00	0.20	0.12	2.02	8.40	0.00	1.49	33.70
Summer 22/23	0.30	2.78	49.34	13.91	0.23	6.32	23.67	0.00	0.00	6.45	0.78	0.00	0.00	103.79
Summer 23/24	5.56	17.99	111.09	19.83	2.93	2.58	4.35	0.20	0.46	13.57	14.32	0.00	1.49	194.38

Table 4: CVS Caused by capping (GWh)

Table 4 shows CV capping is most prevalent in the NE LDZ, which has increased by 125% from the summer months in the previous year. Capping in the NE LDZ is mainly due to greater supplies of gas entering the region from the Teesside and Easington terminals. The gas entering the network at Teesside is typically a higher CV, where Easington typically has a lower CV. Due to the location of Paull Offtakes, which feeds gas into EM LDZ, along with the network configuration in that area, blending of the higher and lower CV gases cannot be achieved before it reaches that Offtake facility. Therefore, there is often a disparity within the CV's entering that LDZ, causing CV capping to occur.

Of the 168 days between April 23 and September 23 that capped in the NE LDZ, 158 of those days were due to Paull Offtake receiving a lower CV to the remainder of the other NE Offtakes.

Similarly, differences in CV values entering NO LDZ from St Fergus and Teesside terminals can impact CV capping although this year, capping has also been caused by bio methane site CV's. Higher CV capping was also seen in EM, SW & WM LDZ's, mainly impacted by two Bio Methane sites and two Offtakes in those areas.

Conclusion

The total assessed pre reconciled UAG quantity for the 1st of April 2022 to 30th September 2023 period is less than the previous six-month period. Monthly assessed pre reconciled UAG is also less than the long-term average (April 2013 to September 2023) for all the last 6 months. Although lower UAG aligns to historical summer throughput trends, the quantity of negative UAG is not typical behaviour.

NGT continue to improve its understanding of the causes of UAG through the use of data visualisation tools and investigative projects.

CV Shrinkage has increased when compared to the same months in the previous year. CV Capping has continued to contribute towards the increase which has predominately been witnessed in NE LDZ.

Continued support from meter owners has enabled NGT to obtain and review meter validation information for NTS entry and exit facilities. This data is being used to support the identification of causes of UAG, to enhance NGT's ability to detect meter error and to inform the preparation of future meter witnessing programmes.

Appendix I - National Grid Gas Plc (NTS) Gas Transporter Licence Special Condition Part J 5.6

Part J: Requirement to undertake work to investigate the causes of UAG and CVS

5.6.53 The licensee must use reasonable endeavours to undertake UAG Projects and compile a CVS Statement for the purposes of investigating the causes of UAG and CVS for each Regulatory Year.

5.6.54 The licensee must, unless the Authority otherwise directs, publish the UAGCVS Reports and provide a copy to the Authority by 1 May and 1 November in each Regulatory Year for the preceding six month period ending on 31 March and 30 September respectively.

5.6.55 The licensee must outline in the UAGCVS Report:

- (a) the UAG Projects the licensee has undertaken in the previous period;
- (b) the UAG Projects the licensee proposes to undertake in the next period and its views on whether, and if so how, the findings of the UAG Projects may be taken forward in order to reduce the volume of UAG;
- (c) the reasons why any UAG Projects that the licensee proposed to undertake have not been undertaken during the Regulatory Year;
- (d) a CVS Statement outlining the work conducted during the previous period to investigate CVS, and explaining the licensee's understanding of the causes of CVS; (e) any additional activities and inspections undertaken by the licensee to improve metering calibration and accuracy;
- (f) a summary of any relevant discussions concerning UAG or CVS at industry fora and with interested parties on a one-to-one basis; and
- (g) any data or information related to UAG or CVS that the Authority may reasonably request.

5.6.56 During the period of 28 days beginning with the date of publication of a UAGCVS Report the licensee must, unless the Authority otherwise consents, publish on its website all the relevant data referred to in the UAGCVS Report.

Interpretation and definitions UAG

is unaccounted for gas and means the amount of gas (GWh) that remains unaccounted for after the Entry Close-out Date following the assessment of NTS Shrinkage performed in accordance with the Uniform Network Code. **UAG Projects** means the projects currently undertaken by the licensee including:

- (a) the witnessing by the licensee of the validation of Measurement Equipment at NTS System Entry Points or Supply Meter Installations at NTS Exit Points; and
- (b) investigation and analysis of data in order to seek to identify causes of UAG.

UAGCVS Report

means a report required under Part J of Special Condition 5.6 (System operator external incentives, revenues and costs).

National Gas Transmission PLC
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom
Registered in England and Wales
No. 2006000