Demand Estimation Sub-Committee Minutes
Monday 07 December 2020
via Microsoft Teams

Attendees

Loraine O'Shaughnessy (Chair)	(LOS)	Joint Office
Helen Cuin (Secretary)	(HCu)	Joint Office

Shipper Members (Voting)

Anupa Purewal	(AP)	E.ON
John Jones	(JJ)	ScottishPower
Louise Hellyer	(LH)	Total Gas & Power
Zoe Ireland	(ZI)	British Gas

Transporter Members (Voting)

Abbie Sheppard	(AS)	National Grid
David Mitchell	(DM)	Scotia Gas Networks
Paul O'Toole	(POT)	Northern Gas Networks Alternate
Sanjeev Loi	(SL)	Cadent
Smitha Coughlan	(SC)	Wales & West Utilities

Observers (Non-Voting)

Joseph Lloyd	(JL)	Xoserve
Joshua Mallett	(JM)	Npower Observer
Luke Reeves	(LR)	EDF Observer
Kiranjit Shergill	(KS)	Xoserve
Mark Perry	(MP)	Xoserve
Mike Maguire	(MM)	Xoserve
Neil Crompton	(NC)	SSE Observer
Shiv Singh	(SF)	Cadent Observer
Simon Bissett	(SB)	Xoserve
Simon Geddes	(SG)	National Grid Observer

Apologies

Emma Buckton	(EB)	Northern Gas Networks

Copies of papers are available at: https://www.gasgovernance.co.uk/desc/071220

1. Introduction and Status Review

Loraine O'Shaughnessy (LOS) welcomed everyone to the meeting and confirmed the meeting was quorate.

1.1. Apologies for Absence

Emma Buckton, Transporter Member

1.2. Note of Alternates

Paul O'Toole (Northern Gas Networks for Emma Buckton).

1.3. Approval of Minutes (05 October 2020)

The minutes from the previous DESC meeting were approved.

1.4. Approval of Late Papers

No late meeting documentation to be approved.

1.5. Review of Actions DESCs Outstanding

DESC 1001: DESC Members to review the 'UIG Taskforce Machine Learning Options' paper and provide views on the consultation questions to Xoserve by close of play on Friday 16th October.
Update: Mark Perry (MP) confirmed that feedback had been received and this action had been completed. **Closed.**

DESC 1002: *Reference the Future of the NDM Algorithm / Sector Consultation* – Xoserve and the Joint Office to liaise on a suitable industry wide email communication in support of the proposed consultation.
Update: See item 5.0. LOS confirmed that communications had been issued via the Joint Office and the consultation had now concluded. **Closed**

Following the update for the outstanding actions MP wished to highlight that in support of Xoserve's Demand Estimation team delivering DESC UNC obligations, Xoserve undertake a survey scheduled twice a year to seek feedback on the process. MP confirmed a link to the short survey will be provided in the Team chat transcript for participants (https://www.surveymonkey.co.uk/r/BQ2J5BJ)

2. NDM Algorithm Performance for Gas Year 2019/20

Mike Maguire (MM) introduced the presentation results for the NDM Algorithm performance for the Gas Demand Profiles for the most recently completed Gas Year 2019/20. MM provided the background, objectives, a brief overview of the Demand Estimation process and outputs, confirming this presentation related to the "Model Performance" phase of the Demand Model cycle.

This was separated into 3 strands, firstly a reflection on the observed weather analysis conditions, secondly a review of the Unidentified Gas (UIG) levels and finally a comparison of the actual NDM Daily Demand Analysis consumption from the validated sample versus the allocated energy from the demand models:

2.1. Strand 1 Weather Analysis

MM clarified that the observed weather conditions on each day and LDZ, expressed as the Composite Weather Variable (CWV) influences the NDM gas demand derived by the allocation formula.

The objective of this presentation was to:

- Share information on the observed weather conditions for Gas Year 2019/20
- Identify periods of unusual weather throughout the Gas Year which may help give context to further strands of analysis, and
- Analyse the relationship between aggregated NDM demand and CWV in the
- complete gas years since parameter optimisation was performed

MM explained DESC shall be discussing 3 different Gas Years (2019/20, 2020/21 and 2021/22) during the meeting and that the Strand 1 to 3 analysis will focus on Gas Year 2019/20.

MM went on to provide the Strand 1 Weather Analysis Daily Observations (page 8), observing the deviations; the Monthly Assessment (page 9), observing the trends for April; and the Confidence Interval Analysis (pages 10-13) based on the observations. MM provided some illustrations, of the confidence intervals, a table illustrating the gas days within the confidence intervals, noting that most of the deviation is seen between April and September and the conclusions.

MM went onto provide details of the reviewed CWV Formula (pages 15-21). MM commented on the big movement of the R^2 value (page 17) when using the new CWV formula, with an improvement of up to 0.0076. A 'closer fit' of the data points was also observed, indicating more variation in daily demands with the new CWV. Under the new CWV definition most LDZs saw an improvement in the relationship between aggregate NDM demand and CWV in Gas Year 2018/19.

MM summarised the observations reporting that there are some encouraging results regarding the recent move to a new Composite Weather Variable formula. Overall, there had been an improvement in relationship between aggregated NDM Demand and CWV in Gas Years 2018/19 and 2019/20 when moving to the new weather basis.

Louise Hellyer (LH) noted that the EA and NT LDZ which saw a decrease, were 2 of the better performing LDZs anyway. MM confirmed it was reassuring to see that the new formula and optimised parameters continue to provide a better relationship to aggregate NDM demand compared with the previous version.

2.2. Strand 2 Unidentified Gas (UIG) Analysis

MM provided some background, outlined the objectives and the approach (page 4) for the Unidentified GAS (UIG) levels. MM provided a summary of each of the 2019/20 seasons for conducting the analysis. MM explained that UIG is the balancing figure, modelling error in the estimate of NDM and that allocation can be a major contributor to daily UIG levels.

MM went on to provide the National Daily Observed UIG (page 5), UIG without a DAF uplift (page 6), the methods used to assess UIG (pages 7-8), the distribution of UIG (pages 9-20), and the conclusions.

MM highlighted that the Covid-19 national 'Lockdown' period, when NDM demand was significantly reduced, the models continued to allocate at normal levels, hence the large negative UIG values. He explained that the national average UIG at D+5 with no uplifts was 1.73%. The DAF Uplifts made very little difference to UIG volatility and overall levels in Gas Year 2019/20, supporting DESC's decision to remove them from Gas Year 2020/21 onwards.

MM reported the distribution of UIG by LDZ, noting that all 13 LDZs had a positive average UIG during Autumn, indicating there is no bias. Winter was similar to Autumn with all 13 LDZs having a positive average UIG during Winter, ranging from 1.20% in LDZ SE to 6.20% in LDZ NW. There was some variations between the Mean and Median values observed in NW and SW LDZ. There were a number of 'outliers' in the negative UIG ranges, these were mainly comprised at the start of the 'Lockdown' period.

MM reported that despite the Covid-19 lockdown period where the UIG was negative during Gas Year 2019/20, the average UIG was still higher than average in 2018/19. This is because the UIG was suppressed in 2018/19 by the ALP uplift factors which meant the NDM allocation was over estimated, so the comparison had differences.

LH asked about AQ shifts, and a drop in AQs reflecting reduced consumption, possibly skewing the values to be higher. Mark Perry (MP) clarified that Xoserve had used the live AQs at the time. LH wanted to understand the possible impacts. Joe Lloyd (JL) explained there is some further information within the Strand 3 analysis, highlighting that there will be a lag, in the system.

MM provided the Conclusion (page 20) confirming that:

- The average UIG had increased since Gas Year 2018/19, moving from a national average (at D+5) of 0.13% to 1.91%, however UIG in Gas Year 2018/19 was supressed due to application of ALP Uplift Factors.

- The shape of the distribution of UIG has not changed too much from the previous Gas Year.
- Autumn and Winter were generally evenly distributed around the Median values. With the effects of the national 'lockdown' having a noticeable impact on UIG during Spring.

MM went on to provide a UIG Simulation using New Demand Models and New CWV Formula (pages 21-27), explaining the approach, observations and conclusions (page 27).

MM explained that when factoring in the new weather and EUC models a reduction in the negative and positive peaks can be observed. The daily national average UIG at D+5 on the new weather basis was 1.31%, down from 1.91% on the old weather basis. This equated to a reduction in UIG of around c.31% which was a very positive outcome and supported DESCs changes to the CWV formula.

MM concluded that Strand 1 showed that, on the whole, the new weather basis had resulted in a better relationship between aggregated NDM demand and CWV, despite the unsettled conditions during the Covid-19 national Lockdown.

MM also noted that a reduction in average UIG levels in Autumn and Winter can be observed when simulated using the new CWV formula and 2020 EUC Demand Models.

2.3. Strand 3 NDM Sample Analysis

JL provided a presentation on the NDM Algorithm Performance (Gas Year 2019/20) Strand 3 NDM Daily Demand Analysis. JL provided the background to cover an evaluation of the NDM Supply Meter Point Demand formula by comparing actual daily demands for NDM supply meter points with estimates of their daily demands across the range of EUCs, objectives, a slide of things to consider (page 3) and an outline of the approach (page 4).

JL explained that the objective was to assess the accuracy of the algorithms for Gas Year 2019/20 and identify possible areas of improvement for future demand modelling. JL noted that an assessment is made on supply meter points which comprise the Demand Estimation Sample and data provided by shippers.

JL went on to provide a breakdown of the source data, an overview of data issues, and pre-payment data for Strand 3. This was followed by a presentation of the Gas Year 2019/20 Results (pages 9-13). JL noted LH's earlier point about the Covid-19 impacts and effects on the patterns of demand, which may impact the interpretation of the results. JL had ran a simulation which supported AQs increasing in the domestic area and decreasing in the I&C.

JL provided the End User Categories (EUC) results for selected band (pages 13 -39) noting observations for each model. JL noted in particular a dramatic change for WM Band 03B (page 31).

JL provided graphs to demonstrate Band 05B for a fully year on Daily actual and allocated demands (assessed against I&C Sites), Winter period for I&C Sites, advising that generally the shape of actual demand follows the same pattern albeit at a level change which could be possibly due to AQ of the sample data. JL went on to show the graphs for Summer period explaining that in all summer months, there has been an over allocation, reflecting the change in demand both during and after the lockdown with smaller differentials in August and September 2020. The NT Band 05B scatter plot shows the (Monday to Thursdays non-holidays) shows the materially different trend during and post lockdown.

JL explained the Mean Absolute Percentage Error (MAPE), being a measure of prediction accuracy of a forecasting method. JL confirmed that MAPE analysis had been performed for each EUC bucket band (across all LDZs) against each of the three bases for Winter, Summer and Full Year periods. JL provided a comparison of the current and previous year (Page 39). The majority of I&C EUCs showed a worsening in allocation over the full year which was expected given the impacts of Covid-19.

JL confirmed that the 'RETRO' analysis is based on the algorithms derived for the current Gas Year (2020/21) but retro fitted with appropriate adjustment for the pattern of days of the week and holidays for Gas Year 2019/20. He explained that this analysis is helpful in assessing the

performance of the most current algorithms had they applied to the gas year being analysed. This assessment did not include the uplift factors applied to the DAFs for Gas Year 2019/20 (as it would not provide a test on the raw derived factors).

JL provided a summary of the findings and the conclusions (page 43) reminding DESC members that they will have the opportunity to review and influence the modelling approach in 2021

Modelling Approach for Gas Year 2021/22 (in Spring 2021) confirming:

- The Strand 3 analysis suggested that new EUC definitions in bands 01B and 02B should continue; and
- The Use of the new CWV will hopefully help to further improve the accuracy of the demand modelling.

3. COVID-19 Winter Impacts – Gas Year 2020/21

Simon Bissett (SB) provided a presentation on the COVID-19 Winter Impacts for Gas Year 2020/21, sharing Xoserve's observations and provided a review of the consumption trends for the Domestic EUC Bands.

SB confirmed Xoserve will be monitoring the impacts of COVID-19 and will compare domestic consumption data during the pandemic and Non-COVID lockdown periods and will take into account the different restrictions over the LDZs.

SB provided some domestic analysis, and graphs illustrating the CWV verses Domestic Consumption. In conclusion SB explained that the results do not indicate any kind of 'step change' in Domestic consumption as a result of COVID-19, with the 4 LDZs shown having typical results. SB confirmed that Xoserve will continue to monitor this over the winter period.

MP wished to note the domestic sample was around 100-150 sites per LDZ, and that there was limited data. He asked the committee to be mindful that the sample may include retired domestic properties where the consumption may not change. MP encouraged some wider insight from Shippers on domestic market trends and asked Shippers to share with Xoserve insight into Domestic market trends during COVID-19.

4. Initial Draft Modelling Approach 2021 Preparations (for Gas Year 2021/22)

MP provided a brief overview on how the EUC Demand Modelling will be performed in 2021/22, explaining that the initial starting point starts with a 'roll-over' of the 2020 approach document. The presentation provided an overview of the process, objective and background to the modelling principles.

MP provided the background to the modelling principles (page 4) and confirmed Version 0.1 of the Modelling Approach document will be shared and will contain all the obvious cosmetic changes and that Xoserve will be looking for DESC to approve the final version at its meeting in February 2021. The next 3-4 months will be used to finalise any changes that need to be made. MP also advised for the avoidance of doubt, current discussions on the future of the NDM Algorithm and any subsequent implementation actions are unlikely to have concluded in time to influence for Gas Year 2021/22.

MP explained that the 2021 Modelling Approach is required ultimately to deliver a set of Gas Demand Profiles for use in Gemini and SAP ISU for Gas Year 2021/22 and could be impacted/improved this year as Xoserve will be using new platform software for performing the validation. MP noted that Holiday Factors / Model Smoothing Approach Adhoc work plan, await recommendations from this work in February 2021.

MP noted that for next year, the approach to the analysis may be unprecedented. There was a lot of unknowns with Covid-19, with the results likely changing demand.

MP outlined the potential modelling options for next year, these were:

- Continue 'as-is' if the data appear suitable, possibly removing certain data points
- Not to use the data collected for period 2020/21 if things look like they will return to normal in 2021/22 and carry forward previous years' models

MP welcomed thoughts on these and any other options.

LH suggested looking at the results before making any decisions on whether to use COVID-19 periods. MP was keen to undertake an informed decision about using data for Gas Year 2021 and the possibility of rolling data forward.

LOS enquired how this would be shared with the wider industry. MP envisaged the use of DESC key messages to keep the industry informed.

MP summarised the modelling approach for 2021 (page 10) and the modelling approach principles (page 11). MP also highlighted the possibility of using the Fall-back position.

MP provided an overview of the interactions and timetable (page 14) and provided key dates for DESC meetings and key publications (page 15).

MP confirmed that the first 'change marked' draft of the Modelling Approach document for the 2021 analysis will be available in December and Xoserve will invite the DESC Technical Workgroup (TWG) representatives and other interested parties to review and comment on the document. In order to meet the Demand Modelling timetable, MP confirmed DESC will be asked to provide final approval of the Modelling Approach document at the DESC meeting on 24 February 2021.

5. Review of NDM Algorithm - Consultation Update

MP shared a summary of the comments received from the recent consultation on the future of the NDM Algorithm and a set of conclusions, to shape any further discussions on how the demand modelling is done.

MP provided a reminder of the background, objective and timetable of the consultation, followed by an overview of the 8 industry responses, results, key messages and conclusions. The 8 responses received were detailed on pages 9 -13 with the headline conclusions on page 14 which summarised:

- There was strong support from all respondents to seek improvements to the performance of the NDM Algorithm, with many referencing the consequential benefits of lower/less volatile UIG
- Qualified support for Machine Learning (ML). Most responses were happy to consider an option where ML is used to improve the existing parameters (i.e., ALPs/DAFs) but not to move to a full 'Blackbox' approach
- Any significant changes from the current approach to Demand Modelling which results in the use of advanced analytical techniques (e.g., Machine Learning) should be proven using simulation and/or parallel running with clear benefits to the industry demonstrated
- There was strong support from most respondents to continue with the current NDM Algorithm and to retain its existing parameters (i.e., ALPs and DAFs). It was clear that these are embedded across the industry for not just NDM allocation but several other processes
- Responses suggest there will be a continued requirement to estimate NDM demand for several years to come

MP went onto provide an update on the DESC Demand Modelling Initiatives (page 16) and some simulations (pages 17-18). MP reported that results clearly showed that DESC are implementing initiatives that are improving the Demand Modelling process and these changes should be given time to allow an assessment.

MP provided more information on the modelling timetable and next steps (page 21-23) and welcomed feedback from the consultation results.

LOS thanked Xoserve and believed this was a useful exercise and asked the Committee for views on the next steps, Review Group, and willing need to attend. The Committee discussed the requirement of needing a Review Group with a view to starting a review in January. It was noted that a sponsor would need to raise a UNC Request to support any UNC Modifications.

MM went on to thank the Joint Office for supporting them through this consultation.

6. DESC Survey (December)

MP referred to his earlier introduction to the December DESC Survey which is run twice a year to support a key performance measure and to capture feedback on how the industry views the role of DESC.

MP wished to provide parties with a link to the short survey which was available at: (https://www.surveymonkey.co.uk/r/BQ2J5BJ)

It was agreed that this item should be added to the January 2021 DESC meeting to provide an update.

7. Communication of Key Messages

LO advised that the Key Messages will be published once received from MP at: www.gasgovernance.co.uk/desc/summarykeymessages

8. Any Other Business

8.1. CWV Calculation Issues

MP confirmed a document had been published which summarised issues on the CWV calculation, noting that most parties should be aware of this from industry communications. MP explained that the presentation published takes the industry through what the issue was and what steps were undertaken to resolve the issue.

There was no further feedback, comments or discussion.

9. Diary Planning

Further details of planned meetings are available at: https://www.gasgovernance.co.uk/events-calendar/month

Time / Date	Venue	Workgroup Programme
10:00 Wednesday 24 February 2021	Microsoft Teams	Agenda Items: • Ad-hoc Work Plan • COVID-19 Impacts – Gas Year 2020/21 • Modelling Approach 2021 Update • NDM Algorithm Review Update
10:00 Wednesday 28 April 2021	Microsoft Teams	DESC TWG
10:00 Monday 24 May 2021	Microsoft Teams	DESC TWG
10:00 Wednesday 07 July 2021	Microsoft Teams	DESC
10:00 Wednesday 21 July 2021	Microsoft Teams	DESC
10:00 Wednesday 06 October 2021	Microsoft Teams	DESC
10:00 Tuesday 14 December 2021	Microsoft Teams	DESC

Action Table (as of 07 December 2020)

Action Ref	Meeting Date	Minute Ref	Action	Owner	Status Update
DESC 1001	05/10/20	4.0	DESC Members to review the *'UIG Taskforce Machine Learning Options'* paper and provide views on the consultation questions to Xoserve by close of play on Friday 16th October.	DESC Members	**Closed.**
DESC 1002	05/10/20	4.0	*Reference the Future of the NDM Algorithm / Sector Consultation* – Xoserve and the Joint Office to liaise on a suitable industry wide email communication in support of the proposed consultation.	Xoserve (MP) & JO (LOS)	**Closed.**