Demand Estimation Sub-Committee Minutes
Monday 09 December 2019
Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA

Attendees

Alan Raper (Chair)	(AR)	Joint Office	
Kully Jones (Secretary)	(KJ)	Joint Office	

Shipper Member

Anupa Purewal	(AP)	E.ON	Voting Member
Jason Blackmore	(JB)	British Gas	Voting Member
John Jones*	(JJ)	Scottish Power	Voting Member
Louise Hellyer	(LH)	Total Gas & Power	Voting Member
Mark Jones*	(MJ)	SSE	Voting Member

Transporter Member

David Mitchell*	(DM)	SGN	Voting Member
Emma Buckton*	(EB)	Northern Gas Networks	Voting Member

Xoserve Representatives

James Hallam-Jones	(JHJ)	Xoserve	Non-Voting
Mark Perry	(MP)	Xoserve	Non-Voting
Martin Attwood	(MA)	Xoserve	Non-Voting
Mike Maguire	(MM)	Xoserve	Non-Voting
Simon Bissett	(SB)	Xoserve	Non-Voting

Observer

Fiona Speak	(FS)	Npower	Non-Voting
Irina Bertrand*	(IB)	Brook Green Supply	Non-Voting
Loraine O'Shaughnessy	(LO)	Joint Office	Non-Voting
Luke Reeves*	(LR)	EDF Energy	Non-Voting
Lyon Joseph*	(LJ)	SGN	Non-Voting
Mark Palmer*	(MPa)	Orsted	Non-Voting
Paul O'Toole*	(PO'T)	Northern Gas Networks	Non-Voting
Sarah Palmer	(SP)	E.ON	Non-Voting
Shiv Singh*	(SS)	Cadent	Non-Voting
Zoe Ireland*	(ZI)	British Gas	Non-Voting

Apologies

Gurvinder Dosanjh	(GD)	Cadent	Voting Member

Copies of papers are available at: http://www.gasgovernance.co.uk/DESC/091219

1. Introduction and Status Review

Alan Raper (AR) welcomed everyone to the meeting and confirmed the meeting was quorate.

1.1. Apologies for Absence

Please refer to the above table.

1.2. Note of Alternates

Mark Perry for Guv Dosanjh.

1.3. Approval of Minutes (07 October 2019 and 05 November 2019)

The minutes from the previous DESC meetings were approved.

1.4. Review of Actions Outstanding

There were no outstanding actions.

2. Seasonal Normal Review 2020

2.1. Review of Seasonal Normal Basis (SNCWV)

Mark Perry (MP) introduced this item by reminding the Committee that during 2019 DESC have reviewed and revised the Composite Weather Variable (CWV) and the basis for deriving the Seasonal Normal Composite Weather Variable (SNCWV) in order to meet UNC Section H obligations.

A presentation was provided for the meeting titled *Review of Seasonal Normal Basis SNCWV – Part 1.* MP briefly took the committee through slides 2-5 covering background, milestones, timetable and objectives. He stated that DESC are at the final milestone to confirm the revised SNCWV values

Mike Maguire (MM) then took the Committee through a more detailed walkthrough of slides 6-23 which provided a recap on the modified CWV formula and parameter optimisation as well as a summary of the work carried out to derive the new history of actual CWVs and a review of CWV composition in the new history.

As part of this presentation, MM provided an illustration through sides 11 to 19 to demonstrate the changes in the underlying structure of the 'old' and 'new' formula of the revised CWV history (1960 to 2017/18) for LDZ NE. He added that similar information for all other LDZs is available upon request.

The average monthly CWV movement across all LDZs was shown in slide 20, highlighting that the majority of monthly average LDZ CWV values have decreased. In addition, CWVs over the summer months have consistently decreased, with the exception of NT which increased during July and August.

He added that the completion of the revised CWV history has enabled the production of summary statistics in relation to the 1 in 20 CWV. A high-level estimate of the change in Peak Day Demand by LDZ was provided (slide 22). MM highlighted that the true impact to Peak Day Demands will only be known for each EUC in each LDZ once all of the models are re-stated on the new basis , the new SNCWV is known and the full peak day simulations are run (expected in Q1 2020).

Sarah Palmer (SP) asked if average demand is expected to increase. In response, MP stated that until the existing models were re-stated it was not possible to confirm the impacts to seasonal normal demand, estimations of these figures are expected in Q1 of 2020. He added that the key driver is to improve the models and CWV can be improved by improving the factors that are used in the calculation.

There was broad agreement that it was important to have a new definition of seasonal norm.

Shiv Singh (SS) thanked Xoserve for providing this analysis, indicating that it helps Cadent understand the impact.

DESC members thanked MM for the presentation stating that they found the presentation useful.

Mark Perry introduced the second presentation titled *Review of Seasonal Normal Basis SNCWV – Part 2* which provided a recap of approved methodology for deriving Seasonal Normal CWV, an overview of data used and results as well as conclusions and next steps. In his introduction he highlighted that a revised presentation was provided for the meeting as there was a small amendment to the Wales North results.

MM then provided a more detailed walkthrough of the presentation. He reminded DESC members that the new CWV formula and parameters include a Solar Radiation term, with a Precipitation term likely to follow pending further investigation. He added that the methodology used to calculate the Seasonal Normal basis was agreed by DESC via teleconference on 05 November 2019 and the presentation provides results for individual LDZs (slides 9 – 73).
A seasonal normal review – LDZ summary was provided (slide 75) as below:

LDZ	Dec to Feb	Mar to May	Jun to Aug	Sep to Nov	Annual
EA	4.64%	0.71%	-0.17%	1.45%	1.05%
EM	0.52%	-1.70%	-3.40%	-1.80%	-2.18%
NE	0.09%	-5.03%	-7.12%	-5.31%	-5.49%
NO	-8.39%	-5.08%	-4.91%	-3.90%	-4.96%
NT	-2.37%	-0.63%	0.63%	0.75%	0.00%
NW	-16.72%	-9.05%	-8.19%	-8.47%	-9.33%
SC	-9.90%	-3.34%	-1.87%	-1.56%	-2.92%
SE	5.06%	-2.04%	-4.61%	-2.19%	-2.18%
SO	3.73%	1.13%	-0.13%	1.69%	1.18%
SW	-2.29%	-4.09%	-5.50%	-3.90%	-4.33%
WM	-16.87%	-5.30%	-2.71%	-3.13%	-4.97%
WN	-7.34%	-5.34%	-5.81%	-2.79%	-5.04%
WS	5.47%	-1.79%	-5.65%	-2.23%	-2.42%

The analysis indicates that 10 of 13 LDZ's have seen a reduction in their overall SNCWV Values. In addition, during the summer months (June to August), the SNCWV values for 12 of 13 LDZ's have
decreased whilst NT has increased.

6 of 13 LDZ's have also seen an increase to their SNCWV values during the winter months (December to February).

MM concluded his presentation by stating that changes to both the 'Shape' and 'Levels' of SNCWV can be observed in most LDZ's and that the majority of LDZ's have seen a reduction in SNCWV values. This can be explained by the changing of the underlying parameters which have been successfully optimised against observed demand. In addition, the coldest days of profiles for all LDZs under the new basis lie between 12 and 20 January and warmest days of profiles for all LDZs under the new basis are between 25 July and 07 August.

Zoe Ireland (ZI) suggested that it would be helpful to have some additional analysis providing a comparison of warmer and colder months to assess if it has got warmer.

New Action 1201: CDSP (MM) to undertake some analysis to show a comparison view of the annual degree day chart using existing CWV and SNCWV values by LDZ level.

AR asked DESC members to vote on the approval of the revised SNCWV values which would become effective from 01 October 2020.

DESC unanimously voted to approve the revised SNCWV values with effect from 01 October 2020.

Post-Meeting Update in relation to Action 1201:

There was an action for Xoserve to replicate the "Degree Days analysis" presented at the DESC meeting on 09 December 2019 but for the current Seasonal Normal and recent CWV history.

The analysis presented at the 08 July 2019 DESC meeting provides this information and can be accesses via the link provided below:

08 July - Review of current SNCWV

2.2. Next Steps

MP then took DESC through the next steps. By 13 December 2019, Xoserve will publish the Seasonal Normal CWV Methodology document (for future reference), along with SNET, SNES, and SNCWV values. The documents will be published on the Secure area of Xoserve's Website (UK Link docs) which all
Users are able to access. In addition, Xoserve will ensure that all communications to relevant Industry Forums is planned for in 2020/

In addition, to these actions, during 2020 the following activities will be undertaken:

- In Q1 of 2020 Xoserve will perform 'back runs' of individual years' EUC models using new CWVs and SNCWVs required for Spring 2020 NDM analysis
- In Q2 of 2020 Xoserve will perform Spring 2020 Modelling using new CWVs and SNCWVs
- In Q3 of 020, Xoserve will produce revised WAALPs for all EUCs using new ALPs, DAFs, CWVs and SNCWVs to support AQ calculations in September 2020
- In Q3 of 2020, Xoserve will produce 'Seasonal Normal Ratios' for each EUC which will be applied to those Supply Points which fail to calculate in the September 2020 AQ Calculation run.

In response to a question from Jason Blackmore (JB), MP confirmed that there will be a data file providing information of historic CWVs back to 1960.

Louise Hellyer (LH) suggested that the planned Q3 analysis would need to be monitored to ensure that there is minimal impact on AP calculations by any meter read issues.

MP concluded this agenda item by formally acknowledging the input from DESC members to enable the analysis to be undertaken and thanked JB for his input.

3. Evaluation of Algorithm Performance for Gas Year 2018/19

MP stated that one of DESC's obligations is to review the performance of the demand models. Three presentations will be provided reviewing Gas Year 2018/19. The analysis includes Strand 1 Weather Analysis which provides context when reviewing the other strands. Strand 2 reviews the levels of Unidentified Gas and Strand 3 compares the actual consumption from the NDM sample data with the allocated values.

3.1. Strand 1 – Weather Analysis

Simon Bissett (SB) provided a walkthrough of the presentation titled *NDM Algorithm Performance (Gas Year 2018/19) Strand 1 Analysis Weather Analysis.* SB briefly covered the background before stating the objective is to review strands 1, 2 and 3.

An overview was provided of the EUC and Demand Model Lifecycle before providing a reminder of the NDM supply meter point demand formula.

SB then shared information on the observed weather conditions for Gas Year 2018/19 and highlighted periods of unusual weather throughout the Gas Year. He added that GB CWV and GB SNCWV values have been derived using weightings based on LDZ throughput over the five-year period 2009 to 2013. Analysis was provided as follows:

- Slide 7: Weather analysis – daily observations
- Slide 8 + 9: Weather analysis – monthly assessment
- Slide3 10-13: Weather analysis – Confidence Intervals analysis

SB concluded his presentation by stating that the overall observed weather during Gas Year 2018/19 when compared to current seasonal normal is that Quarters 1, 2 and 4 were generally warmer and Quarter 3 was generally similar to seasonal normal. SB added that unusual weather was observed on the following days:

- March 2019 was the 6th warmest March in 50 years
- 25 July 2019 a new UK temperature record was set at Cambridge Botanic Garden
- Top 5 colder than normal days were – 01 Feb 2019, 31 January 2019, 29 October 2018, 30 October 2018 and 02 February 2019
- Top 5 warmer than normal days – 20, 21, 22 and 23 April 2019, 21 February 2019.

3.2. Strand 2 – UiG Analysis

MP provided a walkthrough of the presentation titled *NDM Algorithm Performance (Gas Year 2018/19)*
Strand 2 UiG Analysis. MP reminded DESC members that in the summer of 2018, DESC agreed to the application of 'Uplift factors' to the ALP and DAF for Gas Year 2018/19, in order to impact UiG volatility/levels.

He added that for information, a comparison has been provided of the simulated UiG levels without the Uplift factors applied to the NDM allocation. In addition, a comparison showing just a 'DAF Uplift' has also been provided (in line with DESC's decision to apply this for Gas Year 2019/20).

The causes of UiG on a daily basis are not considered as part of the analysis as that is being investigated as part of the UiG taskforce work.

He took Workgroup through the approach and the results of the analysis (slides 4-20) before summarising the conclusions:

- Average UiG has reduced since gas year 2017/18, moving from a national average (at D+5) of 4.40% to -0.13% (assisted by use of Uplift factors)

- The distribution of UiG does not appear to have changed much since the previous gas year, suggesting that the range of UiG has not decreased.

- Autumn: The National average UiG was -0.53%.
  LDZ NO had the smallest average UiG at -0.17%, SW had the largest average at 3.49%.

- Winter: The National average UiG was -1.16%.
  LDZ SC had the smallest average UiG at -0.19%, WN had the largest average at -4.18%.

- Spring: The National average UiG was -1.80%.
  LDZ NE had the smallest average UiG at 0.46%, NT had the largest average at 6.14%.

- Summer: The National average UiG was -0.61%.
  LDZ EM had the smallest average UiG at 0.11%, EA had the largest average at -8.43%.

Overall all seasons appeared to be normally distributed.

3.3. Strand 3 – NDM Daily Demand Analysis

Martin Attwood (MA) provided a walkthrough of the presentation titled *NDM Algorithm Performance (Gas Year 2018/19) Strand 3 Analysis NDM Daily Demand Analysis*. MA said the objective was to assess the accuracy of the algorithms for Gas Year 2018/19 and to identify possible areas of improvement for future demand modelling. He reminded DESC that in the summer of 2018, in order to directly impact the overall levels and volatility of Unidentified Gas (UIG), DESC approved the application of 'Uplift' factors to the approved demand models for Gas Year 2018/19. The impact on Demand Models for Gas Year 2018/19 was:

- Uplifts applied to ALPs for EUC band 01B only (with a slightly greater uplift to Winter period) and
- Uplifts applied to DAFs for all EUC bands

In 2019, DESC also approved the partial application of 'Uplifts' to the Gas Year 2019/20 demand Models. The impact on Demand Models for Gas Year 2019/20 was that uplifts were applied to DAFs for all EUC Bands.

MA explained the approach (slide 4), the source data used (slide 5 and 6) before providing a walkthrough of the analysis (slides 8-21).

MA concluded his presentation by stating that the NDM Daily Demand Analysis suggests that the algorithms which applied for Gas Year 2018/19 did a good job of influencing UIG levels but did not improve the accuracy of NDM allocation. The full year MAPE values improved when using the models without uplifts (except 07B & 08B were marginally worse). He added that assessment of the 2019/20 algorithms showed further improvements in most of the 'B' bands.

In terms of analysis of the new EUC Profiles, he stated that allocation using dedicated profiles for I&C sites in Band 01B and Domestic sites in Band 02B showed clear improvement and supports DESC's decision to introduce these new EUCs. However, to fully utilise these new profiles, Shippers must ensure that the 'Market Sector Flag' held on UKLink is relevant for their portfolios.

Finally, in relation to the modelling approach for Gas Year 2020/21 (in Spring 2020, he indicated that Strand 3 analysis suggests that new EUC definitions in bands 01B and 02B should continue and use of the new CWV (which includes solar radiation) will hopefully help to further improve the accuracy of the demand modelling.

He reminded DESC members that there will be an opportunity to review and influence the modelling approach in 2020.

JB asked if the increase in sample data over recent years has been helpful. MA acknowledged that it was helpful, suggesting that to further improve the demand modelling process, a focus on obtaining a healthy sample size is required, along with improving the accuracy of third-party data."

4. NDM Sample Update

SB provided feedback on the NDM sample data that had been collected to support the evaluation of algorithm performance work and also provided an update on issues through a short presentation titled *NDM sample Update.*

He reminded DESC that UNC Modification 0654S - *Mandating the provision of NDM sample data*, which was implemented on 01 March 2019, requires qualifying Shippers to submit daily consumption data to Xoserve to support Demand Estimation processes. The NDM sample data used in the analysis is derived from 3 sources, Xoserve Managed Sample, Transporter's Managed Sample and Third-Party data as a result of the UNC Mod 654 requirement. He added that only Shipper historical data from October 2018 was used as any other data would not have been subject to full validation.

The data is used for EUC Modelling in Spring and in the Autumn for algorithm performance. SB highlighted the common data issues in relation to third party data:

- Day of the week
- Negative volume
- Volume spikes
- File format
- Market sector code
- Consecutive zero consumption.

SB highlighted that day of the week was the most common issue and stressed the importance of getting this right. He stated that the file format states that the data should be provided to Xoserve using Meter Read Date.

JB asked if there was a reason for the error that could be addressed. In response, SB indicated that it is dependent on when the read is received and therefore a timing issue. In the case of smart meters, the read is taken at midnight and not 5am Gas Day.

In terms of next steps, SB indicated that as reductions are observed in the traditional Demand Estimation samples, Xoserve will need to rely more and more on Third Party data and so it is important that Shippers fully understand the importance of their data submissions. In the new year Xoserve will contact each of the Shippers that have submitted data to provide detailed feedback and offer more support to suit if it is needed.

Xoserve will also progress the change to the File Format via the Change Management Committee meeting

The Performance Assurance Committee (PAC) have indicated that by April 2020 all Shippers with a portfolio greater than 25,000 supply meter points will be expected to submit daily consumption data.

Finally, SB sought support from Shippers for pre-payment data.

5. EUC Modelling Approach - Spring 2020

MP introduced this item saying that the presentation provided is to help DESC to start thinking about the approach to modelling to be used in Spring 2020 which will be creating NDM profiles for Gas Year 2020/21.

He briefly outlined the background, demand modelling framework and objectives stating the final objective of the "Model Principles" phase is to produce a Spring Approach document for the derivation of EUCs and Demand Models effective for the Gas Year 2020/21, which is to be approved by DESC at the February 2020 meeting.

In terms of the demand estimation changes these will be impacted by changes to the CWV formula which will include solar radiation and freshly optimised parameters, changes to SNCWV and any recommendation arising from the work of the UIG Task Force. In addition, CDSP will be using a new platform/software for performing the modelling process.

The main headline here is that the modelling will be performed using the new CWV definitions and SNCWV values. The approach to modelling will be reviewed and voted upon formally at the February DESC meeting next year.

The assumption is to use 39EUCs per LDZ (as per slide 8).

The modelling approach for Spring 2020 analysis will require daily consumption for the period 25 March 2019 to 07 April 2020. MP reiterated that to support the modelling, the CDSP requires daily consumption data for all EUCs, particularly the new definitions for example Pre-Payment Meter Points. He suggested that this is likely to be an area where data will be limited so encouraged Shippers to support this area in particular.

In terms of weather data, he indicated that Xoserve now has its own weather contract which secures easy access to weather data.

He then outlined the modelling principles (slide 11) and the derived factors confirming that the ALP, DAF and Peak Load Factor formulae remain unchanged.

To ensure that the correspondence during the modelling period (April to July) between Xoserve and the TWG remains productive, he encouraged DESC members to check that the Technical Workgroup (TWG) representatives published on the Joint Office website ae still the most appropriate contact: (https://www.gasgovernance.co.uk/DESC/TWGRepresentatives).

MP concluded his presentation by confirming that the first draft of the Modelling Approach document for the 2020 analysis will be available early next year. Xoserve will invite TWG representatives and other interested parties to review and comment on the document before DESC is asked to provide final approval of the Modelling Approach document at the February meeting.

6. Update on Machine Learning

James Hallam-Jones joined the meeting to provide an update on progress of the work on machine learning algorithms, a recommendation being taken forward from the work of the UIG Task Force. He provided a brief overview of the work, findings to date and upcoming work to:

- Explore using the models and findings developed to date to look at building a UIG predictive model and
- Rerunning the Neural Network performance comparison against the existing NDM algorithm for more recent Gas Days.

JB indicated that he would be interested in the results and asked what the basis was for calculating accuracy and asked if DESC can help to validate the results.

JHJ confirmed that the results will be available shortly and early indications are that there is a reduction in LDZ. In terms of validation, he indicated that a number of different approaches were being used including the use of MAPE, standard deviation reduction in error, average UIG.

JHJ said he was happy to provide more information on the results as part of his update at the next meeting.

7. Ad-hoc Work Plan

MP stated that this is a standard agenda item that allows for any new items arising from the meeting to be added to the workplan. There were no items to be added from this meeting.

8. DESC Related Modification/Change Updates

MP provided an update on the DSC Change Proposal XRN 4772 - *Composite Weather Variable (CWV) Improvements,* indicating that it is expected to go 'live' in June 2020.

In addition, Modification 0711S - *Update of AUG Table to reflect new EUC bands* has been proposed by Gazprom to update the Allocation of Unidentified Gas (AUG) Table set out in UNC TPD Section E Annex E-1 to include the new End User Categories (EUC) brought in by DSC Change Proposal XRN4665 Creation of New End User Categories. The Modification is being discussed at the Distribution Workgroup and is expected to report to the 16 January 2020 meeting of the Modification Panel.

9. Communication of Key Messages

A summary of the key messages agreed during the meeting are published separately and can be accessed here: http://www.gasgovernance.co.uk/desc/summarykeymessages.

10. Any Other Business

None

11. Diary Planning for 2020

11.1. 2020 Meeting Dates

AR informed committee members that the 2020 meeting dates have all been added to the Joint Office event diary. He highlighted that there is a potential meeting clash on Wednesday 08 July with the DSC Change Management Committee and sought members views on whether this date should be moved to Monday 06 July 2020. MP stated that Xoserve would be able to support this date but a consequence of having the meeting earlier would mean the meeting papers would not be available 5 working days before the meeting.

DESC members agreed to move the meeting to 06 July 2020.

The full list of 2020 meeting dates is provided below:

Monday 10 February 2020

Monday 27 April 2020

Tuesday 19 May 2020

Monday 06 July 2020

Wednesday 22 July 2020

Monday 05 October 2020

Monday 07 December 2020.

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

Time / Date	Venue	Workgroup Programme
10:00 Monday 10 February 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • Modelling Approach 2020 • Seasonal Normal Review Update • NDM Sample Update
10:00 Monday 27 April 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • Modelling Analysis 2020 – Data Validation and Model composition
10:00 Tuesday 19 May 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • Review progress on Single Year Modelling Results (2019/20 data)
10:00 Monday 06 July 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • 2020/21 NDM Algorithms: Review TWG responses
10:00 Wednesday 22 July 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • 2020/21 NDM Algorithms: • Response to Industry Representations • Weather Station Review • Review Adhoc Workplan • Seasonal Normal Review Update
10:00 Monday 05 October 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • NDM Sample Update • Seasonal Normal Review Update •
10:00 Monday 07 December 2020	Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA	Standard agenda, plus • Evaluation of Algorithm Performance for Gas Year 2019/20 • Modelling Approach – Spring 2021

Action Table (as at 09 December 2019)

Action Ref	Meeting Date	Minute Ref	Action	Owner	Status Update
1201	09/12/19	2.1	CDSP (MM) to undertake some analysis to show a comparison view of the annual degree day chart using existing CWV and SNCWV values by LDZ level. Xoserve (MM) to undertake some analysis to show a comparison view of the annual degree day chart using existing CWV and SNCWV values by LDZ level.	CDSP(MM)	**Closed**