# Demand Estimation Technical Workgroup Minutes
# Tuesday 15 May 2018
# Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA

### Attendees

| | | | |
|---|---|---|---|
| Bob Fletcher (Chair) | (BF) | Joint Office | |
| Helen Cuin (Secretary) | (HCu) | Joint Office | |
| Anupa Purewal | (AP) | E.ON | Representative |
| Dean Pearson* | (DP) | Northern Gas Networks | Alternate |
| Fiona Cottam | (FC) | Xoserve | |
| Hilary Chapman* | (HCh) | Scotia Gas Networks | Representative |
| Jason Blackmore | (JB) | British Gas | Representative |
| John Welch* | (JW) | Npower | Alternate |
| Joseph Lloyd | (JL) | Xoserve | |
| Louise Hellyer | (LH) | Total Gas & Power | Representative |
| Luke Reeves* | (LR) | EDF | |
| Mandeep Pangli | (MPn) | Xoserve | |
| Mark Palmer* | (MPa) | Orsted | |
| Mark Perry | (MPe) | Xoserve | |
| Mark Rixon* | (MR) | ENGIE | |
| Smitha Coughlan | (SC) | Wales & West Utilities | Representative |

### Apologies

| | | | |
|---|---|---|---|
| Chris Warner | (CW) | Cadent | Representative |
| Fiona Speake | (FS) | Npower | Representative |
| Joanna Ferguson | (JF) | Northern Gas Networks | Representative |
| Neil Cromptom | (NC) | SSE | Representative |
| Phil Clough | (PC) | National Grid | Representative |

*via teleconference

*Copies of papers are available at: [https://www.gasgovernance.co.uk/desc/150518](https://www.gasgovernance.co.uk/desc/150518)*

## 1. Introduction and Status Review

### 1.1. Apologies for Absence

Please refer to the above table.

### 1.2. Note of Alternates

Dean Pearson for Joanna Ferguson; and John Welch for Fiona Speake.

### 1.3. Approval of Minutes (24 April 2018)

None.

## 2. Progress on Single Year Modelling results – Small and Large NDM (2017/18 data) – review and validation of modelling run outcomes and way forward

MPe explained that today's presentation was split into 3 three areas and will provide; an introduction to the Modelling Results; the Small NDM Modelling Results; and the Large NDM Modelling Results.

**Single Year Modelling Results**

MPe explained that the key industry processes require various types of gas demand estimation at NDM Supply Points, and these processes include:

- Determining Supply Point Capacity
- Daily Nominations and Allocations
- Determining Annual Quantities (AQs)

MPe confirmed each NDM Supply Point belongs to an End User Category (EUC), and EUCs are used to categorise NDM Supply Points in an LDZ. Each EUC requires an associated Demand Model which represents its gas usage characteristics e.g. weather sensitivity. The Demand Models are mathematical models which provide an estimate of gas demand for each EUC.

For each Gas Year, the Demand Estimation Sub-committee (DESC) will develop or revise the definitions of the EUCs for the LDZ and the Demand Models for each EUC. The CDSP will then implement these. The annual process for determining the EUCs and Demand Models for the following gas year begins with the production of a document called the "Spring Approach"

MPe explained that the Spring Approach provides an overview of the proposed EUC definitions and how the modelling shall be performed, including a reference to the sample data required in order to produce the relevant demand models. DESC approved the latest version of the Spring Approach after its meeting in February, which included the possibility of deriving additional EUCs in Bands 1 and 2. Section H of UNC and the NDM Demand Estimation Methodology document provides more detail of the Demand Estimation process.

MPe confirmed DESC obligations for producing a set of End User Categories and Demand Models for the next gas year. The sample data collected for analysis must include the most recent Winter period (December to March), meaning the sample data collation and validation cannot start until early April. The final EUCs and Demand Models must be approved and submitted to the Authority and loaded to CDSP systems by 15th August.

MPe explained that between April and August the sample data results are reviewed, WAR Band ratios are set, single year models are developed and reviewed, model smoothing is applied, draft Derived Factors are produced and reviewed, followed by an industry consultation in early June. This explains the requirement for agreeing the modelling principles and methodologies in February.

MPe reported that the objective of today, is review the outcome from the modelling and confirm which modeling runs should be used in the model smoothing, which is a key input to the next phase "Model Application".

MPe reminded the DESC TWG of the main principles for this year's modelling described in the "Spring Approach" document. He provided the key aspects of EUC demand modelling basis for Spring 2018 analysis. MPe also provided the basis of the 2018 Modelling.

**TW002 EUC Modelling 2018/19 Small NDM Single Year Modelling Results**

MPn provided a presentation on the Small NDM Sector Modelling Results and explained the Demand Estimation for small NDMs. MPn explained that the EUC consumption ranges are not prescribed in the UNC. There are no proposed changes to the AQ ranges used in EUC definitions for Gas Year 2018/19, however, 3 additional EUCs have been modelled and are proposed to represent Bands 1 and 2. These 3 EUCs will represent Domestic, Non-Domestic and Pre-payment consumers.

Referring to Page 6 MPn reported that the ILFs are generally in line with last year's results, the $R^2$ average is slightly higher than last year. Sample sizes have reduced for all LDZs in comparison to 16/17. All LDZs have less than the suggested sample size.

Referring to Page 7 MPn reported NE had the lowest $R^2$ values of models in the NE LDZ, EUC Band 1 Domestic. JB noted that the peaks were very smooth for the NE and suggested that the wind chill term seemed too low. He noted this was not visible on the UIG data. FC suggested this is something to keep an eye on when looking a CWV next year.

Referring to Page 9 MPn confirmed that this was the first time the EUC Band 1 non-domestic sites had been run on its own. All LDZs (expect SC) had less than the suggested sample size, the average $R^2$ was 97.40%. JB, noted that EA had one of the best $R^2$ for Band 1 Domestic and this tallied with the sample size being the highest. Whereas the non-domestic sites had a high sample size with a lower R2.

The graph on Page 10 for the EA LDZ was queried as there appeared to be a discrepancy and the illustration was not as expected. MPn confirmed that this graph will be checked to ensure the correct data/chart had been included.

LR enquired about the definitions of holidays and bank holidays. MPe confirmed that the full set of holiday rules is provided in more detail within the Spring Approach document.

JB asked whether it would be worth reviewing the holiday code rules, acknowledging these have not been reviewed for some time. MPe agreed to add this to the adhoc work plan for discussion at the July DESC meeting.

Page 12 MPn provided an overview of the weekend effects, observing the $R^2$ values and ILFs may not be enough on their own to confirm a difference in any underlying behaviour. Interrogating the weekend effects is a good way to examine if the new EUCs are displaying an increase or decrease in demand where expected, and not just observing the strength of Demand/CWV relationship. MPn summarised:

- Band 1 Domestic – expect overall increase in demand on the weekends.
- Band 1 Non-Domestic – expect to see a decrease in demand on the weekends.
- Band 2 Domestic – expect to see a similar trend as a Band 1 Domestic profile.
- Band 2 Non-Domestic – expect to see a similar trend as a Band 1 Non-Domestic profile.

The next suite of slides showed the difference between the domestic and non-domestic profiles.

MPn went on to provide a summary of the Pre-Payment data, which consisted of 2600 MPRNs. MPn referring to page 15 confirmed that all LDZs (except NW/WN) have less than the suggested sample size, and there was no comparable model as this is the first time EUC Band 1 Pre-payment sites had been modelled on their own.

The TWG then considered the results provided for EUC Band 2 Domestic sites only on page 18 and whether the two models should be split out. The Workgroup representatives unanimously agreed to proceed with the two groups rather than the one.

MPn provided a summary of the weekend effects analysis. She confirmed that spot checks were taken internally to confirm that these sites are genuine domestic sites. In the all LDZs the aggregation shows that the Friday and Saturday behaviour is not statistically different to a Monday to Thursday profile. It also showed that on Sundays, domestic customers had a decrease in demand in comparison to the Monday to Thursday profile. In the 2 Groups aggregation, there appeared to be a clear distinction. In the northern LDZs it showed that the weekend effects are not statistically different to the Monday to Thursday profile. In the southern LDZs it showed that on a Friday the domestic customer has an increase in demand. On a Saturday there is no statistical difference and on Sundays it showed an overall decrease in demand in comparison to the Mon-Thu profile. Band 2 Non-Domestic customers displayed an overall decrease in demand on weekends.

JB enquired why there would be a drop-in consumption on Sundays, as he didn't understand the behaviour and wondered if there was some pollution with the data. AP explained that some domestics maybe running a business from home which is difficult to verify. LR asked if the Sunday reductions could be examined further.

FC offered a number of options to go with the weekend effects Band 2 (or set to 1 as it is believed to be counter intuitive for there to be a drop-in usage for domestic sites on a Sunday). LH expressed concern about the sample size and relying on data from as small sample. JL explained that taking out the bank holidays would result in less 'Sunday' data which could have had a balancing effect. LR asked for the time series of Sundays to be examined to see if there was pattern of a reduction every Sunday or only certain Sundays. It was agreed that Xoserve would write out to the representatives for Band 2 weekend analysis.

**Post Meeting Note:** *Correspondence has been issued to TWG representatives since the meeting with more details on the supply points used in the Southern LDZ group for the Band 2 EUC modelling. It appears a handful of sites have been used which are non-domestic and so have distorted the weekend factors. These are going to be removed and the results shared with TWG via correspondence.*

Referring to page 25 MPn noted an ILF range change for the Small NDM Modelling Results for EUC Band 3. It was noted that the change in ILFs may have been due to the change in the sample composition. JB expressed concern about topping up some of the sample which could radically change the sample each year and have variable results. The consistency of the samples was briefly considered and that samples could include consistent users but it was probably not necessary to drill down to this level of detail.

Referring to page 30 there was a clear distinction of ILFs showing a clear distinction across WAR bands for all LDZs.

MPn provided a summary of the Small NDM Modelling Results:

- Good $^{R2}$ Coefficients for the majority of Consumption Bands and WAR Band models,
- Decrease in sample numbers available for modelling for EUC Band 1 Domestic sites,
- For EUC Bands 2 to 4 there has been an overall increase in sample numbers.
- TWG decision on EUC Band 2 Domestic sites to go ahead with the two groups rather than the one.

The TWG agreed to move to the model smoothing phase with the Small NDM modelling results presented today and correspond regarding the EUC Band 2 domestic model to work out what to do with weekends, as well as adding the review of the holiday code rules to the workplan to be reviewed in July.

**TW003 EUC Modelling 2018/19 Large NDM Single Year Modelling Results**

JL provided the Large NDM Sector Modelling Results and confirmed the EUC consumption ranges.

JL confirmed that the Large NDM is very much a minority component of overall NDM (11% of total AQ).

JL summarised what was agreed at the April TWG (page 5).

Large NDM Consumption Bands: 5, good results for individual LDZs with good R2 ranges, noting WS was the smallest sample size.

Large NDM Consumption Bands: 6, results for both modelling runs including combined WS/SW. Good results overall for individual LDZs. JL highlighted for WS and SW models were shown in more detail on further slides.

The TWG considered the more detailed graphs. JB asked if there was any partial shutdowns or site issues that could affect the CWV deviation from the fitted line. He also asked about the cold weather upturn and impact of customer behaviour. JB also enquired about expanding the holiday codes and applying these to domestic.

Referring to page 15 JL explained that the SW LDZ EUC Band 6 comparison of monthly residuals for the specific LDZ for the two models had been tested, the residuals were not as good following the aggregation due to poorer characteristics of LDZ WS. JL asked the TWG to provide a view on the preferred model.

JL referred back to the sample populations for WS and SW. JB wished for consistency to keep the LDZs individual. The Workgroup representatives agreed to keep the LDZ individual as with last year.

JL explained for the Large NDM Consumption Bands: 7 and 8, there was good results overall for the majority of individual LDZs. JL highlighted the results for SE/SO and WS/SW models and provided further detailed slides.

Referring to page 30 JL reported that the residuals were mixed, some large improvements from the aggregation but several months, July, September, October and February are poorer. JB asked what the decision was for last year for consistency. JL confirmed the aggregation was agreed for last year and confirmed the sample sizes. JL asked the Workgroup to provide a view on the preferred model. The Workgroup representative agreed to keep the aggregation as with last year i.e. with SE/SO and WS/SW combined.

JL reported for the Large NDM Consumption Band 9, as with previous years this band is a national aggregation. For the Large NDN War Bands he summarised the agreed modelling runs made at the April TWG. Referring to page 35 JL confirmed that the results showed reasonably good R2 values and the ILFs demonstrated distinct levels.

Referring to page 36 WAR Bands 7&8, JL confirmed a decision was required on either keeping the two most northern groups separate or to merge them due to the low sample numbers in WAR bands. He confirmed that individual runs show the WAR Band 4 groups as having strong R2 values. A number of more detailed slides were presented.

JL provided a comparison of the monthly residuals for the WM LDZ for the two models tested. JL highlighted that the example WM LDZ benefits from the aggregation by having lower residuals. The TWG discussed the impact of aggregation and the impacts to the R2. JB expressed concern about losing regional levels with aggregation and if this should be considered for next year. There was a general consensus for keeping them separate and to proceed with the 3 LDZ Group model.

JL provided the NT LDZ WAR Band 1. He confirmed that the variability in the data points across the different seasons is consistent with a weather insensitive model.

JL provided a summary of the Large NDM Modelling Results, confirming good R2 Coefficients for majority of models, including WAR Bands, some lower values in WAR Band 1 and that merging sample data for Bands 7 and 8 for modelling purposes has helped results remain acceptable.

JL provided a recap on the decisions made:

- Consumption Band 6: Individual
- Consumption Band 7&8: Individual LDZ with SE/SO and WS/SW combined
- Consumption Band 7&8 WAR: 3 LDZ Grouping

The Workgroup representative provided a recommendation to move to the model smoothing phase with the Large NDM modeling results.

HL enquired about pulling out the days when there had been gas deficit warnings and if these could skew the results. She stressed that these may not have been in the sample but this may still skew the results if there is a reaction to extreme events.

3.  **Next Steps**

JL provided a slide to confirm the next steps. These were:

- Once all single year models have been approved the "Model Application" phase commences. This begins with model smoothing. During this phase it is possible the CDSP may need to contact the TWG for further prompt decisions on the modelling analysis
- The CDSP will then use the output from the smoothed models as the basis for producing the annual Derived Factors which consist of Annual Load Profiles (ALPs), Daily Adjustment Factors (DAFs) and Peak Load Factors (PLFs)
- Week Commencing 4th June Xoserve will publish the draft Derived Factors for DESC and TWG to review and provide feedback
- The TWG and DESC will have 3 weeks to review the draft Demand Estimation parameter values and provide feedback, with responses no later than Friday 22rd June
- DESC TWG and DESC meetings are planned for 9th July to review feedback received and seek approval to publish to wider industry participants

JL also confirmed that access to the Xoserve website will be required to review parameters.

## 4. Any Other Business

None raised.

## 5. Diary Planning

*Further details of planned meetings are available at: www.gasgovernance.co.uk/Diary*

Workgroup meetings will take place as follows:

| Time / Date | Venue | Workgroup Programme |
|---|---|---|
| 10:00 Tuesday 09 July 2018 | Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA | DESC Technical Workgroup<br><br>Review responses to draft 2018/19 NDM Algorithms and provide a recommendation to DESC |
| 12:30 Tuesday 09 July 2018 | Radcliffe House, Blenheim Court, Warwick Road, Solihull B91 2AA | DESC<br><br>Review and approve the 2018/19 NDM Algorithms |

**DESC Action Table (as at 13 February 2018) For Information Only**

| Action Ref | Meeting Date | Minute Ref | Action | Owner | Status Update |
|---|---|---|---|---|---|
| **DESC1104** | 21/11/17 | 3.2 | ALL DNs to investigate their current contract arrangements to assess if it is possible to procure day ahead (D+1) 8am weather forecasts. | ALL DN's | **Carried forward** |
| **DESC1105** | 21/11/17 | 3.2 | Xoserve (FC) to investigate whether 8am weather can be used in the day ahead calculations. | Xoserve (FC) | **Carried forward** |
| **DESC1106** | 21/11/17 | 3.2 | ~~DNs~~ NTS to clarify the EU requirement for publication of 11am nomination run data at day ahead (D+1). | ~~DNs~~ NTS | **Carried forward** |
| **DESC 0201** | 13/02/18 | 2.0 | Xoserve (MA) to provide reconciliation analysis for the SSPs and LSP's (any additional months) for the next meeting. | Xoserve (MA) | **Pending** |
| **DESC 0202** | 13/02/18 | 3.0 | Xoserve (MP) to work with TWG to investigate the 'cut off' process deployed and assess if any process changes are required. | Xoserve (MP) | **Pending** |
| **DESC 0203** | 13/02/18 | 3.0 | E.ON (SB) to contact Ofgem for them to request data from the Shippers for modelling purposes (proposed new EUC bands and existing EUC bands). | E.ON (SB) | **Pending** |
| **DESC 0204** | 13/02/18 | 3.0 | British Gas (JB) to investigate relationships between additional weather data items and gas demand and how these could be incorporated into the CWV formula. | British Gas (JB) | **Pending** |
| **DESC 0205** | 13/02/18 | 3.0 | Xoserve (MP) to document the changes to Spring Modelling Approach and for it to be sent to the DESC Members, for them to approve it via email by the end of February 2018. | Xoserve (MP) | **Pending** |
| **DESC 0206** | 13/02/18 | 4.0 | Xoserve (MP) to produce a Strawman of the existing Work Plan items listing the impacts, next steps and prioritisation <u>and</u> to include two new items - Review appropriateness of EUC definitions for Bands 5 to 8, and Explore if other weather data items have a relationship to gas demand and if so how could they be incorporated to the CWV calculation. | Xoserve (MP) | **Pending** |

Page 8 of 8