

UNC Workgroup 0754R Minutes
Investigate Advanced Analytic Options to improve NDM Demand Modelling

Tuesday 23 March 2021

via Microsoft Teams

Attendees,

Rebecca Hailes (Chair)	(RH)	Joint Office
Maitrayee Bhowmick-Jewkes (Secretary)	(MBJ)	Joint Office
Ceiran Sheehan	(CS)	Total Gas & Power
Cosmin Popovici	(CP)	Total Gas & Power
Daniel Etheridge	(DE)	Ecotricity
Dan Stenson	(DS)	British Gas
Ellie Rogers	(ER)	Xoserve
Emma Buckton	(EB)	Northern Gas Networks
John Jones	(JJ)	ScottishPower
Joseph Lloyd	(JL)	Correla on behalf of Xoserve
Kirsty Dudley	(KD)	E.ON
Lauren Jauss	(LJ)	RWE
Mark Perry	(MP)	Correla on behalf of Xoserve
Mark Rixon	(MR)	Independent Consultant
Paul O'Toole	(PT)	Northern Gas Networks
Rosie Cox	(RC)	Cadent
Sanjeev Loi	(SL)	Cadent
Sarah Palmer	(SP)	E.ON
Steve Mulinganie	(SM)	Gazprom

Copies of all papers are available at: www.gasgovernance.co.uk/0754/230321

The Workgroup Report is due to be presented at the UNC Modification Panel by 18 November 2021.

Rebecca Hailes (RH) welcomed everyone to the meeting.

1.0 Outline of Modification

Mark Perry (MP) introduced the Request, explaining it is proposing that the Workgroup investigate alternative 'advanced analytics' options to improve the accuracy of the End User Category (EUC) Demand Models. These are used to derive the Gas Demand Profiles which are key parameters in the calculation of Non-Daily Metered (NDM) Allocation and Capacity Invoicing.

MP noted that by the end of this meeting, the Workgroup should ideally:

- Agree to an objective statement,
- Confirm the scope of the Request,

- Understand what resources and expertise are available to support the proposed analysis.

Background

MP provided background to the Request, noting that following the implementation of Project Nexus, Xoserve set up an Unidentified Gas (UIG) task force to investigate and reconcile UIG.

MP explained that the task force reviewed the likelihood of Machine Learning to replace or support the algorithm which estimates the daily view of NDM demand, as limitations to the algorithm can contribute to UIG. The UIG task force undertook several phases of Machine Learning investigation aiming to better understand the drivers of UIG and identify options to reduce levels/volatility of daily UIG. The UIG task force's recommendations¹ have been published. Please see the published slides on the meeting page for detailed information.

MP noted that the Demand Estimation Sub Committee (DESC) is currently responsible for reviewing the NDM algorithm under the Uniform Network Code (UNC), and implementing changes that would increase the accuracy of the algorithm and the NDM Allocation process.

MP explained that DESC's obligation to review the NDM algorithm, along with the UIG task force's recommendations had led to an industry wide consultation on the NDM algorithm, and there was strong support from all respondents to seek improvements to the performance of the NDM algorithm and investigate alternative options to estimate NDM demand.

MP added that Xoserve as the Central Data Service Provider (CDSP) had supported this Request Workgroup being established in response to the industry views received following the NDM algorithm consultation, to identify how the industry can move forward. The Modification Proposer is S Mulinganie, Gazprom.

The Workgroup discussed this, with key points noted below:

- Steve Mulinganie (SM) noted that when reviewing the outcomes from this analysis and discussions, Xoserve would need to consider that when sites with Smart meters or Automated Meter Reading (AMR) devices move to Product Class 2, it would negate the requirement for NDM calculations for these sites and therefore reduce reliance on the NDM algorithm.
- Dan Stenson (DS) suggested that as the role of DESC was to estimate demand, this Workgroup should disregard internal organisational impetus and focus on the best course for the future of the industry.
- SM noted Xoserve's conclusions from the NDM consultation stated there was:

'Strong support from most respondents to continue with the current NDM Algorithm and to retain ALPs and DAFs. Very clear that these are 'embedded' across the industry for not just NDM allocation but several other processes';

However, SM noted that it did not clarify why Annual Load Profiles (ALPs) and Daily Adjustment Factors (DAFs) should be retained and queried whether ALPs and DAFs were used for any other purpose.

¹ <https://www.xoserve.com/services/issue-management/unidentified-gas-uig/#task-force-findings-etc>

- RH noted there was a concern amongst consultation respondents that the algorithm could not be replicated, and only Xoserve with Machine Learning could generate it. SM agreed with this and added that it was challenging if the logic driving the strategy could not be reproduced.

Rationale behind Workgroup

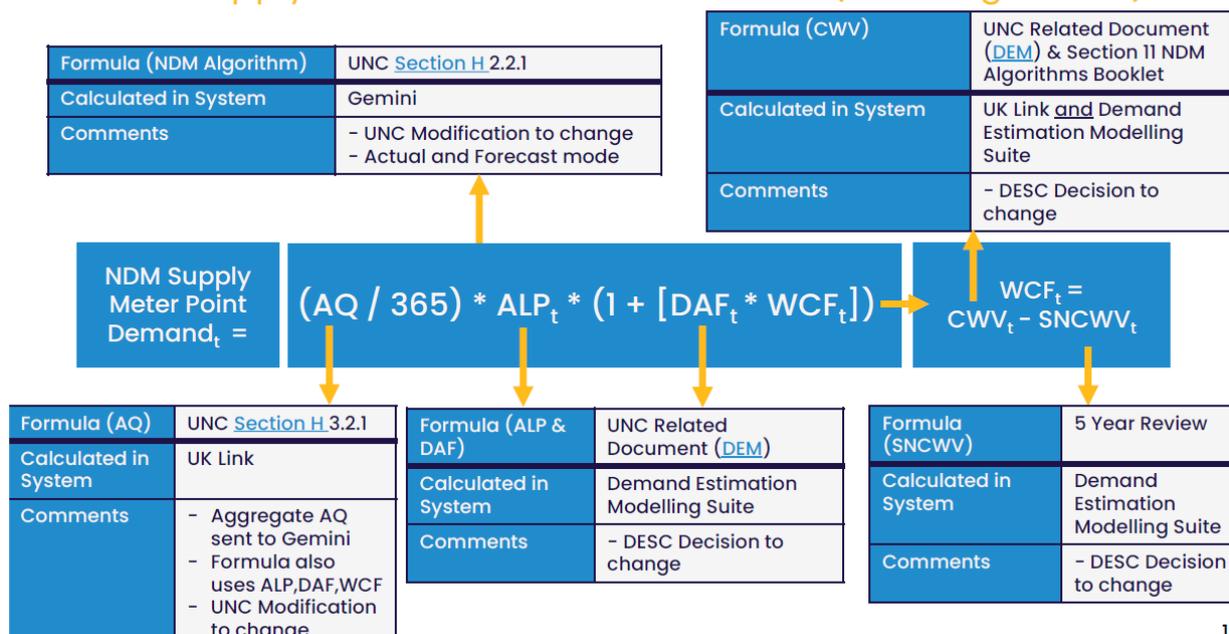
MP outlined that the rationale behind this Workgroup was to:

- Support DESC’s UNC obligation to review the NDM Algorithm
- Explore and progress UIG Task Force findings
- Build on clear industry support for investigating advanced analytical approaches
- Reduce UIG volatility and subsequent Meter Point reconciliation/UIG volumes by improved NDM Allocation accuracy.

NDM Algorithm

MP presented the current NDM Algorithm, (official title is Supply Meter Point Demand Formula) and explained how it works as well as the impact of any amendments being made to it, as highlighted below:

NDM Supply Meter Point Demand Formula (“NDM Algorithm”)



The Workgroup discussed this, with key points noted below:

- MP explained that the NDM algorithm was calculated within the Gemini system, which is owned by National Grid NTS. SM asked for clarity and was informed by MP that whilst the calculations for the algorithm are done within Gemini, it uses input from the UK Link system, such as Annual Quantity (AQ) or Composite Weather Variable (CWV) to make its calculations.
- SM and MP agreed that making any changes to the algorithm would have the impacts identified in MP’s presentation. RH noted it was beneficial to identify any impacts and risks as early as possible.

- DS challenged whether National Grid NTS as owner of Gemini could attend the Workgroup. Ellie Rogers (ER) noted that a National Grid representative may be available. RH advised she would seek this clarification and report back to the Workgroup.

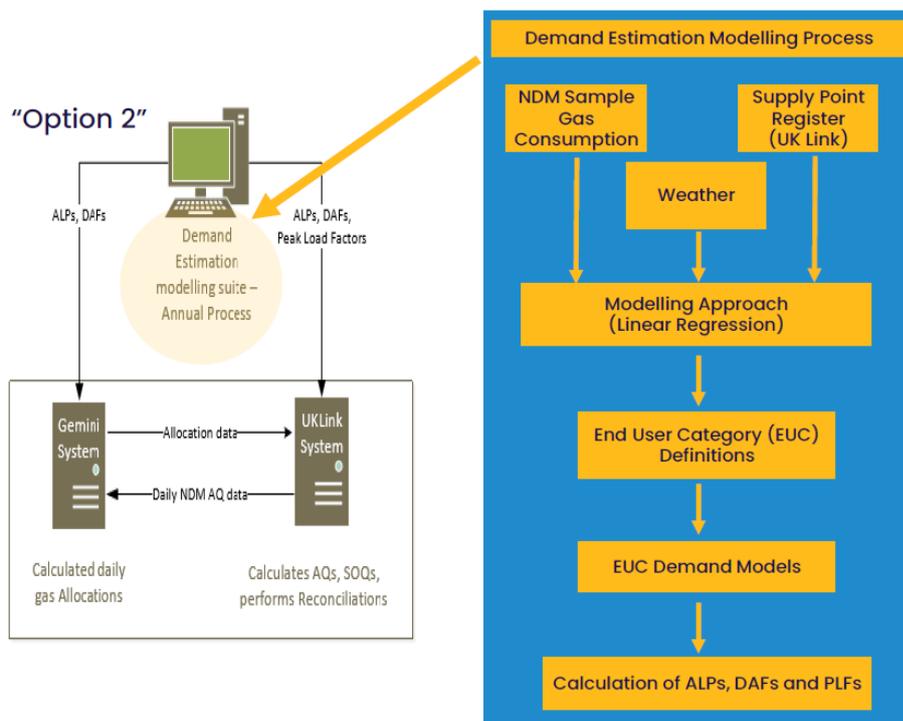
New Action 0301: RH and MP to seek input from National Grid NTS and/or Xoserve representatives involved with Gemini, regarding impacts of changes to Gemini on this Request Workgroup 0754R

- Kirsty Dudley (KD) noted that any concerns around the Gemini system were only relevant if the formula was going to be amended and that the Workgroup should not be concerned with the Gemini system unnecessarily. The Workgroup agreed with this view.

Outline of Scope

MP noted that the responses to the NDM algorithm consultation identified that the industry was supportive of a radical approach to using advanced analytics (e.g. Machine Learning), as set out in the options paper for the consultation, and there was preference for ‘Option 2’ from the paper, which retained ALPs, DAFs and Peak Load Factors (PLFs).

Please see the published slides for more detailed information.



MP suggested that the scope of this Review should be to consider how different advanced analytical techniques could be used to improve processes which produce the EUC Demand Models that are required to create the key parameters of ALP, DAF and PLF, and therefore the Workgroup should not consider any options which remove ALP, DAF, PLF, CWV and Seasonal Normal Composite Weather Variable (SNCWV) parameters. MP invited the Workgroup’s comments regarding the proposed scope. Key points from the discussion are noted below:

- DS was concerned about the quality of data being used and noted he was not comfortable with a ‘blackbox’ solution. MP clarified that all the data being used is published and can be used to calculate the ALP and DAF independently.

- The Workgroup debated whether or not the Option 2 approach should be taken and the benefits of not using ALPs and DAFs as parameters. The UIG task force recommendations were also discussed.
- KD suggested that the Workgroup could use Option 2 as a starting point to develop their scope, agreeing with the view that a blackbox solution was not the best approach. However, she noted that when the Workgroup refer to Option 2 without the background and context from where it was derived, it appears that the Workgroup have already discounted all other options. KD emphasised that whilst the Workgroup could start this review from Option 2, they should be open to taken on board any other options available. MP agreed with this suggestion.
- DS added that this Workgroup should investigate all possibilities to improve demand modelling without disregarding any avenues of investigation from its scope.
- SM agreed, suggesting no boundaries should be set around the scope of the Workgroup when setting out the next steps.

Current State Overview

MP provided an overview of the the current state of the EUC Demand Models. Please see the slides for detailed information. The key points of discussion arising from this were:

- MP proposed that prior to any further discussions around the scope of this review, the Workgroup should consider the different techniques that can improve EUC demand modelling.
- DS asked whether the scope being proposed was the correct approach for this Workgroup, i.e. whether it was just reviewing ALPs and DAFs or whether the scope was wider. MP confirmed that the scope should be wider.
- MP explained that the current process of producing ALP or DAF depends on a linear regression, but if alternative ways of producing them exist, this process can be refined to form a more sensitive and adaptable parameter. MP emphasised that he was suggesting this as only one area of investigation and he did not intend to constrain the Workgroup in anyway.

Areas to investigate

MP set out the potential areas for the Workgroup to investigate, listed below, explaining that he has identified which parts of the modelling process should be reviewed and potentially improved:

1. Investigate use of advanced analytics to:
 - a. Improve the validation processes of NDM sample gas consumption to identify erroneous supply meter points
 - b. Improve the 'infilling' of missing data
2. Investigate use of advanced analytics to review the appropriateness of the existing EUC definitions
3. Investigate use of additional data items on Supply Point Register for use in derivation of EUC definitions and production of Demand Models
4. Investigate use of advanced analytics to enhance further the weather vs demand relationship
5. Investigate use of advanced analytics to trial alternative approaches for producing more accurate EUC demand models.

The Workgroup discussed these with the key points of discussion noted below:

- SM noted that granular data could lead to greater insights and suggested use of data from Smart Meters and AMR would provide the level of granularity required.
- DS questioned what additional inputs would be necessary for modelling, agreeing that Smart Meter data would have the level of granularity required.
- SM noted that access to data is still restricted and that part of the challenge would be to consider new ways data can be accessed via new technology, including influencing the industry if required to get this data.
- DS asked whether Xoserve or the Joint Office could obtain smart metering data from the Data Communications Company (DCC) in an anonymised form before passing it to the industry. JL confirmed that this avenue of investigation may allow the Workgroup to get granular information on geographical area, meter types etc.
- KD noted that it was important to ascertain the costs of obtaining and disseminating this kind of data before committing to this course of action as very few industry members would agree to carry out the work required to obtain the information from this data.
- SM noted the next steps should draw out any costs and benefits from this proposal.

Aims of Workgroup & Success Criteria

MP set out the aims for the Workgroup and the proposed success criteria, which the Workgroup discussed, with key point noted below:

- DS noted that when reviewing the algorithm, the Workgroup needs to consider seasonality and the changes arising from the changing weather in summer or winter.
- MP noted that PLFs should not be changed more than 1% as proposed in the success criteria as this could potentially cause major upheaval in the market.

SM responded that as the market changed, whether the 1% factor still appropriate, adding that volatility could create benefits and the 1% should not be a blocker. MP accepted this was a fair challenge.

- The Workgroup decided they would review success factors in more detail later.

Next Steps

MP asked the Workgroup who would be interested in volunteering for this project. RH asked them to clarify what resources and interest they had. The Workgroup volunteered their expertise but noted they were all limited by operational constraints and were unable to provide any further 'manpower' resource towards carrying out the analysis required.

SM asked how much analysis could be done centrally and noted that he would not want to carry out any work that could benefit a competitor. He suggested the UIG task force model be used where funds are made available centrally and the work was carried out by Xoserve in their capacity as the CDSP.

SM added that if Xoserve were unable to do this work, this could be raised at the DSC Contract Management Committee to procure funding and resources, noting that as this work would be beneficial to the whole industry, it would be unlikely to progress without fairly allocated costs and resources. DS and KD supported this suggestion as the work carried out would be objective.

KD explained for the project to receive funding at the DSC Contract Management Committee, the details of the costs and resources being requested would need to be clarified. SM agreed and added that a business case would need to be developed before the request could be made.

RH suggested that the Workgroup should confirm its objective. SM queried whether the Workgroup objective would include advocating transfer of sites with Smart and AMR meters

to Product Class 2 . RH confirmed this would not be part of the Workgroup's remit. SM challenged this as he advised this would improve accuracy and quality of data being obtained.

After some discussion, RH asked if SM wanted the Workgroup's objective to be reworded formally, which SM confirmed. RH confirmed the amended objective would be much broader:

- to investigate improvements to NDM Demand Modelling.

The Workgroup accepted this amendment.

RH summarised the Workgroup's discussions:

- The Workgroup agreed to making its objectives wider, with the new objective statement stating the Workgroup would review improvements to NDM demand modelling accuracy.
- RH suggested adding a separate section to the scope of the Workgroup to allow for the amended objective. MP noted that the primary driver for this Review was the UIG taskforce findings, but the Workgroup would not add a section regarding transitioning appropriate sites to Product Class 2.
- The Workgroup wanted a clearer understanding in relation to resources and expertise. MP confirmed Xoserve did not have a great deal of either at present so he would need to liaise with his colleagues before he could confirm what work could be carried out.

SM noted that whilst the industry was fully supportive of the Request, they could not support with funding or resources at this time.

DS asked Xoserve to identify:

- what the cost would be for them to carry out an initial benefit analysis in relation to SND_t , and
- what resources they would need in terms of data, time or funding to investigate the use of advanced analytics to trial alternative approaches for producing more accurate EUC demand models.

MP accepted this request.

New Action 0302: Xoserve (MP) to identify a) what the cost would be for them to carry out an initial benefit analysis in relation to SND_t , and b) what resources they would need in terms of data, time or funding to investigate the use of advanced analytics to trial alternative approaches for producing more accurate EUC demand models.

2.0 Initial Discussion

2.1. Issues and Questions from Panel

None raised.

2.2. Initial Representations

None received.

2.3. Terms of Reference

The standard UNC Workgroup Terms of Reference will apply and is available at www.gasgovernance.co.uk/mods

3.0 Next Steps

It was anticipated that MP would provide further analysis as summarised by RH under item 1.0 ahead of the next meeting.

MP asked the Workgroup to review the UIG taskforce analysis that has been published and to give some thought to measures needed to test this over before next meeting.

New Action 0303: Workgroup to review the UIG taskforce recommendations to review before the next meeting. The recommendations can be found at:
<https://www.xoserve.com/services/issue-management/unidentified-gas-uig/#task-force-findings-etc>

MP asked for his and the DESC inbox email addresses to be included in the minutes for any Workgroup members to contact him if required:

Mark.J.Perry@correla.com

Xoserve.demand.estimation@xoserve.com

4.0 Any Other Business

None.

5.0 Diary Planning

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

Workgroup meetings will take place as follows:

Time / Date	Venue	Programme
10:00 Wednesday 12 May 2021	Microsoft Teams	Standard agenda items.

Action Table (as at 23 March 2021)

Action Ref	Meeting Date	Minute Ref	Action	Owner	Status Update
0301	23/03/21	1.0	RH and MP to seek input from National Grid NTS and/or Xoserve representatives involved with Gemini, regarding impacts of changes to Gemini on this Request Workgroup 0754R	Joint Office (RH) & Xoserve (MP)	Pending
0302	23/03/21	1.0	Xoserve (MP) to identify a) what the cost would be for them to carry out an initial benefit analysis in relation to SNDt, and b) what resources they would need in terms of data, time or funding to investigate the use of advanced analytics to trial alternative approaches for producing more accurate EUC demand models.	Xoserve (MP)	Pending
0303	23/03/21	3.0	Workgroup to review the UIG taskforce recommendations to review before the next meeting. The recommendations can be found at: https://www.xoserve.com/services/issue-management/unidentified-gas-uig/#task-force-findings-etc	All	Pending

Action Table (as at 23 March 2021)

Action Ref	Meeting Date	Minute Ref	Action	Owner	Status Update
			findings-etc		