



## **DESC Technical Work Group**

### **EUC Modelling 2016/17: Data Validations and Aggregations**

**TWG – 26<sup>th</sup> April 2016**

- Overview of Demand Estimation & Timetable
- Presentation of Current Completed Analysis
  - Modelling Basis / Source data
  - Small NDM – sample details, proposed aggregations and WAR band limits
  - Large NDM – sample details, proposed aggregations and WAR band limits
- Review and conclusions

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# Demand Estimation changes for this year

- UNC Modification 432 is due to be implemented at 5am on 1<sup>st</sup> October 2016, along with UK Link replacement and changes to the Gemini system.
- The changes in this Modification include a revision of the NDM Nominations and Allocation formula – see new arrangements below:

$$\text{Supply Point Demand} = (\text{AQ}/365) * \text{ALP} * (1 + [\text{DAF} * \text{WCF}])$$

- The main points to note are:
  - WCF – The Weather Correction Factor will be based on the differences in weather variables (CWV and SNCWV)
  - DAF – The Daily Adjustment Factor will be calculated using only the EUC model weather sensitivities
  - SF – The Scaling Factor will be removed meaning NDM Allocation will no longer be the balancing figure
  - UG – Unidentified Gas will now become the balancing figure for the Total LDZ demand

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# Purpose of NDM Modelling

- Provides a method to differentiate NDM loads and provide profiles of usage  
i.e. End User Category (EUC) Definitions
- Provide a reasonable **bottom up** estimate of aggregate NDM demand (by EUC / shipper / LDZ) to allow the daily balancing regime to work  
i.e. NDM profiles (ALPs & DAFs)
- Provide a means of determining NDM Supply Point capacity  
i.e. NDM EUC Load Factors
- The underlying NDM EUC and aggregate NDM demand models derived each year are intended to deliver these obligations only
- NDM allocation is an initial estimate of demand which will be corrected by Meter Point Reconciliation

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# Role of DESC and TWG

- Responsibilities for Demand Estimation changed following implementation of UNC Modification 331 on 3rd January 2012
- DESC collectively required by UNC to:
  - Submit proposals to Transporters and Users for each Gas Year comprising:
    - EUC Definitions
    - NDM Profiling Parameters
    - Capacity Estimation Parameters
  - In addition:
    - Analysis of accuracy of the allocation process
    - Derivation of CWV and Seasonal Normal
    - Consultation with Industry
- Xoserve acts as the common NDM Demand Estimation service provider

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# Agreed 2016 Modelling Work plan

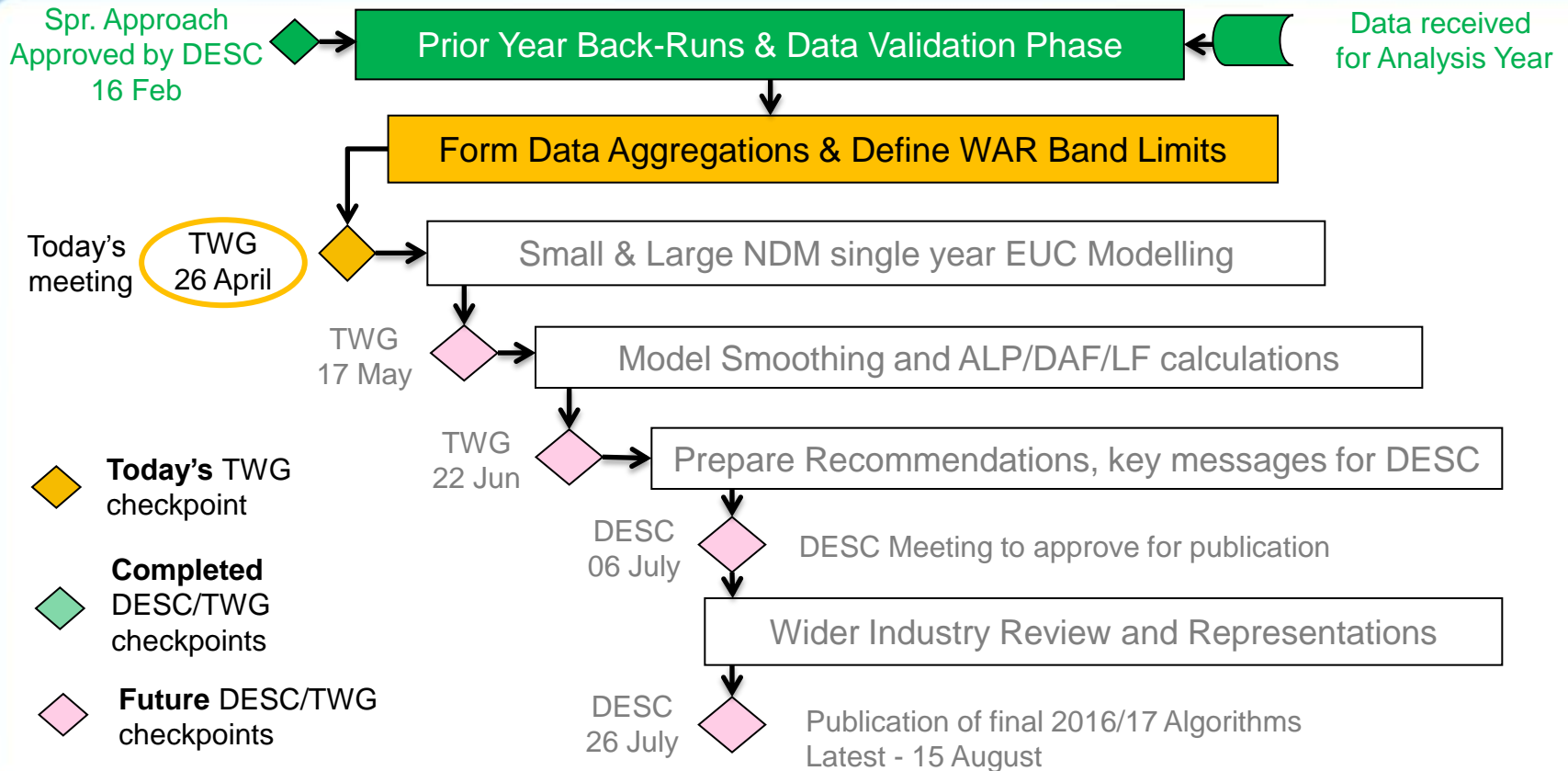
- Work plan for 2016 Modelling included as part of Spring Approach document which was confirmed and agreed at 16<sup>th</sup> February DESC meeting
- Work plan provides more transparency of process and includes checkpoints for DESC/TWG review

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# Agreed 2016 Timetable



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# Objectives of this Meeting

- Key objectives of April TWG meeting:
  - Inform TWG of numbers of validated data sets collected
  - Consider the most appropriate data sets and aggregations to apply to the most recently available sample data - i.e. 2015/16
  - Validation and analysis for Small NDM (up to 2196 MWh pa) and Large NDM (> 2196 MWh pa) are considered separately
- Tight timescales and unpredictable timings mean that Teleconference is chosen means of engagement
- Required Outcome:  
TWG agreement to sample sizes, agreed aggregations and WAR band limits – needed prior to commencing next phase of modelling

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# Basis of 2016 Modelling

- The main principles for this year's modelling is described in the 'Spring Approach' document - approved at February DESC meeting
- Key inputs to the EUC demand modelling for Spring 2016 analysis is:
  - Daily demand data for period **1<sup>st</sup> April 2015** to **31<sup>st</sup> March 2016** which includes full Easter holiday period (as defined by the modelling system), sourced from:
    - Xoserve-managed sample data sets (Bands 1 and 2)
    - Transporter-managed sample data sets (Bands 2 and above)
    - Third party provided sample data sets (Bands 2 and above) \* **NEW** (see next slide)
  - Weather data:
    - In line with last year we shall be using Composite Weather Variable (CWV) definitions and Seasonal Normal basis (SNCWV) agreed by DESC at the end of 2014 and effective from 1<sup>st</sup> October 2015

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# Use of Third party data

- Over recent years the numbers of sample points available for modelling has been decreasing (other than consequential boost from UNC Mod 428 – “Single Meter Supply Point”)
- UNC allows Transporters to obtain NDM sample data from third parties
- DESC recently requested analysis to be undertaken to review the suitability of additional data being used with the existing sample
- Following analysis presented at the 17<sup>th</sup> Nov ‘15 meeting, DESC approved the use of third party supplied data, starting with Spring ‘16 modelling work
- Joint Office issued a note on 15<sup>th</sup> Feb ‘16 requesting support from third parties in providing data to boost sample numbers. One party has come forward with a data stream suitable for modelling in the timescales required

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# Summary of Validated Data

## Small NDM & Large NDM EUCs

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# Summary of Validated Data

- Validated sample counts – numbers provided are supply points

EUC Bands: Range <i>Source data</i>	2015/16 data	2014/15 data
<b>Band 1: 0 to 73.2 MWh pa</b> <i>Xoserve-managed</i>	2,616 Domestic (-219)	2,835 Domestic
<b>Bands 2 to 4: 73.2 to 2,196 MWh pa</b> <i>Xoserve-managed, Transporter-managed and Third party provided</i>	6,250 (+1,536)	4,714
<b>Bands 5 to 9: &gt; 2,196 MWh pa</b> <i>Transporter-managed and Third party provided</i>	3,055 (+181)	2,874

- Band 1: Reduction in numbers as expected due to impacts of battery replacement programme
- Bands 2 and above: There has been a boost to sample numbers for two main reasons:
  - Third party provided data has contributed **678** supply points to Bands 2 to 4 and **84** to Bands 5 to 9
  - Consequential impacts of UNC Modification 428 being fully implemented

- Spreadsheet [TW\\_A\\_SAMPLE\\_VAL\\_SUMM\\_V1\\_260416.xlsx](#) provides details of validation outcomes, including reasons for validation failures

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## Small NDM Analysis

EUC Bands: 1 to 4  
Range: <2,196 MWh

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- Small NDM for Demand Estimation purposes <2,196 MWh
- Represents 88.6% of total NDM load (71.6% <73,200) and 99.97% of all supply points
- EUC consumption ranges not prescribed in Uniform Network Code
- Purpose of analysis:
  - Present validated sample data available and proposed data sets
  - View of results so far and proposed aggregations
  - Highlight any issues raised

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# Proposed Small NDM EUC Bands

- Current EUC Bands / Consumption Ranges for Small NDM:
  - Band 1: 0 – 73.2 MWh pa
  - Band 2: 73.2 – 293 MWh pa
  - Band 3: 293 – 732 MWh pa
  - Band 4: 732 – 2,196 MWh pa
- There are no proposed changes to EUC definitions for Gas Year 2016/17

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# Small NDM Consumption Bands: Review of data

EUC Bands: Range	Comments on 2015/16 data Proposed Aggregations	Final Aggregations for 2014/15
<b>Band 1: 0 to 73.2 MWh pa</b>	No sample size issues Individual LDZ analysis	Individual LDZ analysis
<b>Band 2: 73.2 to 293 MWh pa</b>	No sample size issues Individual LDZ analysis	Individual LDZ analysis
<b>Band 3: 293 to 732 MWh pa</b>	Low sample size in WS LDZ See s/sheet * for recommendation (Table B.3)	Individual LDZ analysis (WS/SW combined)
<b>Band 4: 732 to 2,196 MWh pa</b>	No sample size issues Individual LDZ analysis	Individual LDZ analysis

- Spreadsheet \*TW\_B\_SAMPLE\_POP\_SMALL\_2604016.xlsx provides sample numbers per LDZ for Bands 1 to 4 and any recommendations for additional runs

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# Small NDM - WAR Band Analysis

EUC Bands: 3 to 4

Range: 293 to 2,196 MWh

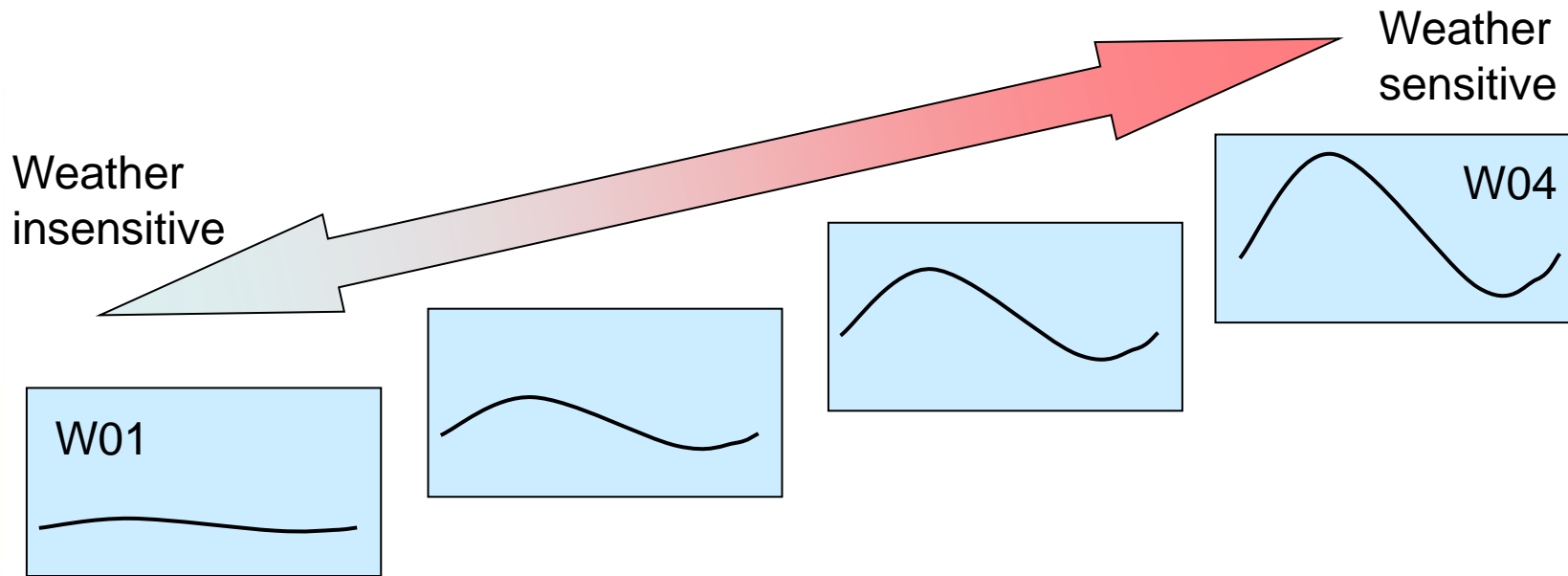
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# Winter: Annual Ratio (WAR) Band EUCs

- Higher AQ Bands where meter points are monthly read have a standard EUC plus 4 differential EUCs based on ratio of winter consumption to total annual consumption
- Sites with adequate read history allocated automatically to a WAR Band based on system calculation during AQ review



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# Winter to Annual Ratio (WAR) Band EUCs

- The WAR value of a supply point is defined as the actual consumption in the months December to March divided by the new supply point AQ
- Since the numerator is an actual demand and the denominator is a weather corrected annual consumption, WAR values change from year to year
- The limits defining WAR band EUCs are those applicable to the most recent winter (in this case winter 2015/16)
- This is essential because supply points will be assigned to these newly defined WAR band EUCs (for 2016/17) based on their (Dec-Mar) consumption behaviour over winter 2015/16

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- WAR values are affected by December to March weather experience:
  - 2015/16 was warmer than 2014/15, so thresholds can be expected to decrease this year
- When setting WAR band limits, the approach previously adopted is to aim for a 20%:30%:30%:20% split of sample numbers on a national basis
- There are practical limitations due to the actual distribution of WAR values of individual sample supply points in the consumption band
  - WAR band ratio boundaries will again be defined at 3 decimal points to make it easier to get closer to the target % splits
- For practical reasons we can only proceed to the modelling stage with one WAR band definition per band

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# Small NDM WAR Bands: Review of data

EUC Bands: Range	Comments on 2015/16 data Proposed Aggregations	Final Aggregations for 2014/15
Band 1: 0 to 73.2 MWh pa	Not generally Monthly read – no WAR Bands	
Band 2: 73.2 to 293 MWh pa	Not generally Monthly read – no WAR Bands	
Band 3 and Band 4 (combined): 293 to 2196 MWh pa	Low sample size in WS LDZ therefore Individual LDZ analysis (NW/WN, WS/SW combined)	Individual LDZ analysis (NW/WN, WS/SW combined)

- See spreadsheet [TW\\_B\\_SAMPLE\\_POP\\_SMALL\\_260416.xlsx](#) (Table B.5) for recommendation on aggregations and WAR Band definitions

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## Large NDM Analysis

EUC Bands: 5 to 9

Range: >2,196 MWh

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# Total NDM Population Counts: Supply Point & AQ

EUC Bands: Range	% of Total NDM	
	Total AQ	Total SP Count
Band 1: 0 to 73.2 MWh pa	71.6%	98.78%
Bands 1 to 2: 0 to 293 MWh pa	78.1%	99.67%
Bands 1 to 4: 0 to 2,196 MWh pa	88.6%	99.97%
Bands 5 to 9: >2,196 MWh pa	11.4%	0.03%

- On an AQ basis:

- Small NDM is by far the main component of the overall NDM sector
- The range 0-73.2 MWh pa constitutes nearly 3/4 of overall NDM
- The range 0-293 MWh pa constitutes nearly 4/5 of overall NDM
- The range 0-2196 MWh pa constitutes nearly 9/10 of overall NDM
- Large NDM is very much a minority component of overall NDM

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# Large NDM Analysis (>2,196 MWh pa)

- Current EUC Bands / Consumption Ranges for Large NDM: :
  - Band 5: 2,196 to 5,860 MWh
  - Band 6: 5,860 to 14,650 MWh
  - Band 7: 14,650 to 29,300 MWh
  - Band 8: 29,300 to 58,600 MWh
  - Band 9: >58,600 MWh

} 1 Consumption Band  
} x4 Winter Annual Ratio (WAR) Bands

1 Contingency Band for sites which should be DM
- However, underlying demand modelling can be done on basis of more broadly aggregated bands
  - DESC agreed in Spring 2014, as part of the adhoc analysis of EUC Definitions, that the bands 14,650 to 29,300 (Band 7) and 29,300 to 58,600 (Band 8) should be merged for modelling purposes if necessary
- Identify sample data available post validation and propose aggregations

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# Large NDM Consumption Bands: Review of data

EUC Bands: Range	Comments on 2015/16 data Proposed Aggregations	Final Aggregations for 2014/15
<b>Band 5: 2,196 to 5,860 MWh pa</b>	Low sample size in WS See s/sheet * for recommendation (Table C.1)	Individual LDZ analysis
<b>Band 6: 5,860 to 14,650 MWh pa</b>	Low sample size in WS See s/sheet * for recommendation (Table C.2)	Individual LDZ analysis (WS/SW combined)
<b>Band 7 and Band 8 (combined): 14,650 to 58,600 MWh pa</b>	Low sample sizes in WS, SE & SO See s/sheet * for recommendation (Table C.3)	Individual LDZ analysis (NW/WN, WS/SW, SE/SO combined)
<b>Band 9: &gt;58,600 MWh pa</b>	National	National

- Spreadsheet \* TW\_C\_SAMPLE\_POP\_LARGE\_2604016.xlsx provides sample numbers per LDZ for Bands 5 to 9 and any recommendations for additional runs

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# Large NDM - WAR Band Analysis

EUC Bands: 5 to 8

Range: 2,196 to 58,600 MWh

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# Large NDM WAR Bands: Proposed Analysis

EUC Bands: Range	Comments on 2015/16 data Proposed Aggregations	Final Aggregations for 2014/15
<b>Band 5: 2,196 to 5,860 MWh pa</b>	5 or 4 LDZ Groups * See s/sheet * for recommendation (Table C.5)	By 7 LDZ Groups
<b>Band 6: 5,860 to 14,650 MWh pa</b>	3 or 2 LDZ Groups * See s/sheet * for recommendation (Table C.6)	By 3 LDZ Groups
<b>Band 7 and Band 8 (combined): 14,650 to 58,600 MWh pa</b>	3 LDZ Groups See s/sheet * for recommendation (Table C.7)	By 2 LDZ Groups
<b>Band 9: &gt;58,600 MWh pa</b>	N/A - No WAR Bands	

- Spreadsheet \* [TW\\_C\\_SAMPLE\\_POP\\_LARGE\\_2604016.xlsx](#) provides sample numbers per LDZ for Bands 5 to 8 and any recommendations for additional runs

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# Meeting Summary

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- Summary of decisions reached
- Recap on agreed actions, owners and timescales
- Any further questions about this stage ?
- Next steps towards TWG check point in May:
  - Xoserve to commence single year modelling once all aggregations have been agreed
  - Xoserve may contact TWG for prompt decisions on modelling analysis (probably by email)
  - TWG meeting booked for Tuesday 17<sup>th</sup> May

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