Demand Estimation Sub Committee

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

26 April 2023

Contents

- Section 1
    - Background & Overview

- Section 2
    - Summary of Daily Gas Consumption Collection and Validation

- Section 3
    - Review of sample datasets available for use in Small NDM Modelling

- Section 4
    - Review of sample datasets available for use in Large NDM Modelling

- Section 5
    - Next Steps

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

SECTION 1: BACKGROUND & OVERVIEW

Overview

- An overview of the Demand Estimation process and output can be found here

- Annual modelling cycle of activities are represented in diagram opposite

- This presentation relates to the "Input" phase of the Demand Model cycle

1. MODELLING APPROACH:
End User Category (EUC)
Demand Models
Gas Demand Profiles

2. INPUT:
Maintain Sample
Data Collection & Validation
Weather Stations / Data

3. MODELLING:
Latest Analysis Period
Review Results
Model Smoothing

4. GAS DEMAND PROFILES:
Annual Load Profile (ALP)
Daily Adjustment Factor (DAF)
Peak Load Factor (PLF)

5. INDUSTRY CONSULTATION:
DESC Review
NDM Algorithms Booklet
Industry Review
Core Systems Updated

6. MODEL REVIEW:
Ad hoc Workplan
NDM Algorithm Performance

DEMAND ESTIMATION:
Gemini: NDM Nominations / Allocation
UK Link: AQ and SOQ Calculation / Read Estimation

4

CDSP / DESC Obligations and Timetable: October 2022 to September 2023

Milestone	UNC H Ref	2022			2023								
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
DESC Membership confirmed	1.12	✔											
NDM Sampling: Data Collection and Validation	1.6	✔						✔					
NDM Algorithm Performance for Gas Year 2021/22	1.8			✔								✔	
DESC Adhoc Workplan	1.7	✔		✔			✔						
DESC Modelling Approach – EUCs and Demand Models	1.7			✔			✔						
Single Year EUC Demand Modelling	1.7								✔				
Model Smoothing and Draft Gas Demand Profiles	1.7									✔			
Industry Consultation	1.8									✔	✔		
Gas Demand Profiles finalised and Core systems updated	1.9											✔	
Climate Change Methodology progressed (SN Review 2025)	1.4			✔			✔		✔		✔		

Background

- The requirement to develop Demand Models and End User Categories relies upon certain key inputs, these are daily gas consumption data and daily weather data

- At this meeting, the focus is on the daily gas consumption data which this year covers the period 1st April 2022 to 31st March 2023. This period includes a full Easter holiday period as defined by the modelling system

- The daily gas consumption data has been provided from the following sources:

    - Transporter-managed sample data sets
    - Third party provided sample data sets
    - Class 3 Data for EUC 01BPD (Domestic Prepayment consumers)

- Validation is applied to the daily gas consumption data in order to minimise data errors and therefore enhance the accuracy of the subsequent EUC gas demand models

- The validation is set out in the Modelling Approach document here (Appendix 2)

Objectives

The objective of the "Input" phase is to agree how the sample points available for modelling (post validation) should be deployed in the next phase - "Modelling"

Objective of today's meeting is for DESC to:

- Review the number of sample points available for this year's Analysis Period of 1st April 2022 to 31st March 2023

- Based on data available confirm the EUC definitions which require demand models

• Confirm the optimum data sets to be used to represent the demand models, using LDZ aggregations where necessary	Vote Required

• Agree the Winter Annual Ratio (WAR) Thresholds for EUC Bands 3 and above	Vote Required

Target Numbers and Stratification

- DESC agreed at its meeting on 10th December 2018 to apply a stratification method to Band 1 Domestic and Band 2 Non-Domestic sites. The following sub bands were agreed:

    - Band 1: 0-10, 10-20, 20-30 and 30-73.2 MWh

    - Band 2: 73.2-140, 140-210 and 210-293 MWh

- At the meeting on 1st March 2023, DESC agreed that should there be sufficient data (i.e. meets/exceeds the specified target number), then heavily populated EUCs will be subject to stratification.

- Where the validated sample points for a particular EUC band are well in excess of the ideal target numbers, DESC agreed that a process should be created to select the required number of sample points needed to be representative of the population (which means in these cases not using all of the sample points available).

- Network managed samples will be prioritised ahead of third party data. Any additional sites obtained from third party provided data will be randomly selected to avoid any shipper bias in the demand profiles created.

Modelling Approach Changes

- At the DESC meeting on 1st March 2023, changes to how the sample data would be utilised for some of the EUC Bands in the Small and Large NDM sector were approved following analysis presented as part of the recent Ad hoc workplan

- These changes are:

  - Source data for Band 1 Domestic Non Prepayment (and Small I&Cs) is now reliant on MOD654s submissions only, now the CDSP sample has been disbanded

  - Bands 03 and 04 WAR Bands to be modelled separately (were previously aggregated)

  - Bands 05 to 08 Sample Data will be aggregated for Bands 06 to 08 WAR Band modelling, (Band 05 WAR Bands to be modelled separately)

  - Band 09 Consumption (Bucket) Band to use Band 08 Consumption Band Model ALPs and DAFs

Pre-Payment EUC Demand Models

- This year, as per the agreement at DESC on 2nd March 2022, Class 3 data will be used for EUC 01BPD

- Unfortunately, we have not received sufficient Pre-Payment data from eligible Shippers (as per rules defined by UNC MOD654s)

- Now that Class 3 data is being used, it is imperative that the data held in UK Link for Meter Mechanism and Payment Method is kept up to date

- There are **c. 1.7m** supply points which are currently assigned to this EUC

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

SECTION 2: SUMMARY OF DAILY GAS CONSUMPTION COLLECTION AND VALIDATION

Analysis

- The next section of the presentation will detail Supply Meter Point counts as of 1st April 2023

- This will include:
  - Population
  - Target Sample Size
  - Active Sample
  - Sample Post Stratification

- Prepayment EUC Data Collection

- Validation Rules Summary

Population Size - April 2023 NDM

- The table below highlights the current population size for each LDZ and EUC combination
- These values are used to calculate the Target Sample Size

Population Size - April 2023 - Class 3 and 4 only														Total
	LDZ													
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BND	1,941,347	1,215,774	2,668,404	1,381,006	2,375,050	2,012,181	247,119	826,112	1,948,945	2,119,803	2,473,669	1,754,387	1,593,144	22,556,941
01BNI	40,138	26,062	63,372	35,419	51,652	44,021	7,023	19,897	40,352	60,296	55,494	39,482	38,624	521,832
01BPD	186,264	87,116	234,637	98,609	156,116	156,365	22,386	74,285	115,399	219,973	194,606	76,329	86,136	1,708,221
01BPI	201	102	462	188	292	292	51	202	199	584	453	142	176	3,344
02BND	3,788	1,910	5,112	3,012	4,165	3,801	300	1,050	3,935	8,367	7,212	3,105	2,372	48,129
02BNI	11,812	7,119	16,037	8,913	13,440	12,467	1,659	4,447	11,160	16,685	14,697	11,333	9,444	139,213
02BPD	113	83	214	134	143	185	8	51	118	230	162	50	62	1,553
02BPI	8	6	8	3	1	4	0	0	2	13	4	4	3	56
03	4,258	2,284	4,761	2,432	3,814	3,649	436	1,189	3,314	5,593	4,202	3,216	2,450	41,598
04	1,823	846	1,758	979	1,528	1,568	221	529	1,284	2,676	1,592	1,256	965	17,025
05	467	196	483	253	379	406	46	143	276	694	320	253	212	4,128
06	116	76	181	100	190	128	27	41	117	169	90	89	83	1,407
07	51	27	65	44	75	53	12	17	42	36	21	29	39	511
08	20	18	35	13	53	30	7	18	31	21	22	17	19	304
09	0	0	8	0	12	4	0	3	2	2	1	0	1	33
	2,190,406	1,341,619	2,995,537	1,531,105	2,606,910	2,235,154	279,295	927,984	2,125,176	2,435,142	2,752,545	1,889,692	1,733,730	25,044,295

13

Target Sample Size - April 2023 NDM

- The Target Sample Size using a confidence level of 95% is shown below for each LDZ / EUC:

Target Sample Size - April 2023 - Class 3 and 4 only														
	LDZ													Total
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BND	385	385	385	385	385	385	384	385	385	385	385	385	385	5,004
01BNI	381	379	383	381	382	382	365	378	381	383	382	381	381	4,939
01BPD	384	383	384	384	384	384	379	383	384	384	384	383	383	4,983
01BPI	132	81	210	127	166	166	45	133	131	232	208	104	121	1,856
02BND	350	321	358	341	352	350	169	282	351	368	366	343	331	4,282
02BNI	373	365	376	369	374	373	313	354	372	376	375	372	370	4,762
02BPD	88	68	138	100	104	125	8	45	90	144	114	44	54	1,122
02BPI	8	6	8	3	1	4	0	0	2	13	4	4	3	56
03	353	330	356	332	350	348	205	291	345	360	353	344	333	4,300
04	318	265	316	277	308	309	141	223	296	337	310	295	275	3,670
05	211	130	214	153	191	198	41	104	161	248	175	153	137	2,116
06	89	64	123	80	127	96	25	37	90	118	73	72	68	1,062
07	45	25	56	40	63	47	12	16	38	33	20	27	35	457
08	19	17	32	13	47	28	7	17	29	20	21	16	18	284
09	0	0	8	0	12	4	0	3	2	2	1	0	1	33
Total	3,136	2,819	3,347	2,985	3,246	3,199	2,094	2,651	3,057	3,403	3,171	2,923	2,895	38,926

14

Validation Rules Summary

- The tables below show the current rules used in the sample validation for a 12-month period

Small NDM: 0 to 2,196 MWh p.a.

EUC Bands	Missing Days		Consecutive Zeros		Spike Ratios	
	Summer	Winter	Summer	Winter	Summer	Winter
01	15 or more	15 or more	N/A	33 or more	15:01	08:01
02, 03 and 04	28 or more	28 or more	N/A	20 or more	10:01	05:01

Large NDM: >2,196 MWh p.a.

EUC Bands	Missing Days		Consecutive Zeros		Spike Ratios	
	Annual	Winter	Annual	Winter	Annual	Winter
05,06,07 and 08	40 or more	20 or more	N/A	20 or more	08:01	N/A

Additional Validation Rules

- At the DESC meeting on 1st March 2023, additional validation rules were agreed and documented in the Modelling Approach document. These are:

  - Comparing the CWV intercept and R2 (Regression of CWV vs Demand) against the final cleansed data for each MPRN (particularly suited for those EUCs that you expect to be weather sensitive)

  - A review of zero values, specifically in the winter period. This is for all zero consumption not just the continuous zeroes as that is part of the initial validation (although, consideration of the gas price impacts for Autumn/Winter 22/23)

  - Day of the Week check. Whilst not in the modelling approach document, this is a check that we have done for a while. However, recently we improved that to match the daily consumption against the CWV

  - Another check that has been performed for a while but is not included in the modelling approach document is a check of the Sample AQ vs Rolling AQ in UK Link

Validation Audit Trail

TABLE A.1 - VALIDATION SUMMARY OF DAILY GAS CONSUMPTION DATA	
Analysis Period	01/04/22 to 31/03/23
START: MPRs with at least 300 'Daily Gas Consumption Data' records present within the analysis period	58,700
REMOVED: Exceeds Missing Read Tolerance	11,972
REMOVED: Missing Correction Factor	189
REMOVED: Exceeds Consecutive Zero Consumption Tolerance	6,928
REMOVED: AQ Ratio Failures	2,405
REMOVED: Winter vs Summer Consumption Ratio Tolerance (Band 09B sites)	31
REMOVED: Winter Annual Ratio (WAR) Outside of Tolerance	211
REMOVED: Twin Stream Site	11
REMOVED: Excluded MPRN (i.e. HyDeploy or FlexGen site)	194
REMOVED: Excessive Number of Records Infilled	364
REMOVED: Excessive Number of Consecutive Records Infilled	139
REMOVED: Multiple Data Providers	96
REMOVED: Exceeds Missing Read Tolerance Post Validation	9,149
REMOVED: CWV Intercept and R-Squared	675
REMOVED: Market Sector Code of D in I&C EUC	183
REMOVED: Winter Zero Consumption	47
REMOVED: Other (i.e. Scottish Independent LDZs; No LDZ on IS-U)	288
REMOVED: TOTAL	24,229
PASSED VALIDATION (Pre Capping and Stratification)	34,471
REMOVED: MPRs not required following Stratification	8,488
PASSED VALIDATION (Post Stratification)	25,983

Note: MPRs may fail more than one category, therefore the total removed during validation may not match the sum of individual rejection reasons

Active Target – April 2023 NDM

- The table below shows the number of sites that passed validation for each EUC / LDZ
- **Bold** highlights where we have exceeded the number of sites set out in the target numbers
- Any EUC / LDZ combinations that have exceeded the target will be capped

Active Sample Size – April 2023														
	LDZ													Total
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BND	379	356	374	364	376	**414**	255	279	**406**	285	370	**394**	348	4,600
01BNI	**763**	**615**	**1059**	**608**	**629**	**510**	60	**636**	508	**544**	**627**	394	**567**	7,520
01BPD	256	**407**	**842**	**418**	306	359	224	248	222	202	268	244	**383**	4,379
01BPI	0	1	0	0	0	0	0	0	0	0	1	0	0	2
02BND	27	22	32	28	32	28	15	17	31	41	39	27	20	359
02BNI	**1108**	**425**	**1267**	**524**	**780**	**825**	66	**746**	500	**774**	**656**	589	545	8,805
02BPD	0	0	0	0	0	0	0	0	0	1	0	0	0	1
02BPI	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3	**770**	169	**431**	222	309	290	32	219	251	348	**368**	260	227	3,896
4	**517**	176	252	238	207	237	35	156	205	272	**340**	244	162	3,041
5	179	78	101	85	84	100	12	48	60	108	112	81	38	1,086
6	67	34	48	53	45	31	4	16	24	32	32	35	33	454
7	20	21	19	26	33	19	2	7	9	5	10	7	4	182
8	18	12	13	**16**	28	9	3	7	9	7	9	4	10	145
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4,104	2,316	4,438	2,582	2,829	2,823	708	2,379	2,225	2,619	2,832	2,279	2,337	34,471

Post Stratification - April 2023 NDM

- This table shows the final numbers that will be passed to the modelling process following stratification and capping:

Sample Numbers After Stratification and Reduction - April 2023														
	LDZ													Total
	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	
01BND	379	356	374	364	376	385	255	279	385	285	370	385	348	4,541
01BNI	381	379	383	381	382	382	60	378	381	383	382	381	381	4,634
01BPD	256	383	384	384	306	359	224	248	222	202	268	244	383	3,863
01BPI	0	1	0	0	0	0	0	0	0	0	1	0	0	2
02BND	27	22	32	28	32	28	15	17	31	41	39	27	20	359
02BNI	373	365	376	369	374	373	66	354	372	376	375	372	370	4,515
02BPD	0	0	0	0	0	0	0	0	0	1	0	0	0	1
02BPI	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3	353	169	356	222	309	290	32	219	251	348	353	260	227	3,389
4	318	176	252	238	207	237	35	156	205	272	310	244	162	2,812
5	179	78	101	85	84	100	12	48	60	108	112	81	38	1,086
6	67	34	48	53	45	31	4	16	24	32	32	35	33	454
7	20	21	19	26	33	19	1	7	9	5	10	7	4	181
8	18	12	13	16	28	9	3	7	9	7	9	4	10	145
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,371	1,996	2,338	2,166	2,176	2,214	707	1,729	1,949	2,060	2,261	2,040	1,976	25,983

19

Data Collation Issues

During the phase of collating data from multiple sources, we encountered some issues that has meant the number of validated sites has reduced:

- Late submissions
  - MOD654s Shippers (monthly & 6 monthly) need to submit their data by the 5th Business day in April. Anything received after this date will not be used as it would reduce the window for validation

- No submissions
  - There is still a number of MOD654s Shippers that have not submitted data

- Spread across all EUCs
  - Third Party Submission tend to be for the smaller EUCs, please ensure that the sample sent is reflective of your portfolio across all EUCs

Data Stratification Issues

Whilst performing stratification a number of observations were identified:

- Not as much data as previous years has made stratification difficult and would result in smaller numbers being passed to Modelling

- There has been a shift in Sample Data meaning that less data was available in the higher AQ bands, we suspect that this is caused by the decrease in consumption during the analysis period, likely to be caused by the price increase

- We have noticed a potential issue with Market Sector Code (MSC) that is held in UK Link. A large portion of the population in 01BNI are in the smallest AQ sub band (0-10MWH), we suspect this is being caused by domestic sites with an incorrect MSC of I.

Data Validation Observation

- When looking through regression analysis there was a common outlier for almost all LDZs in EUC Bands 6, 7 and 8:
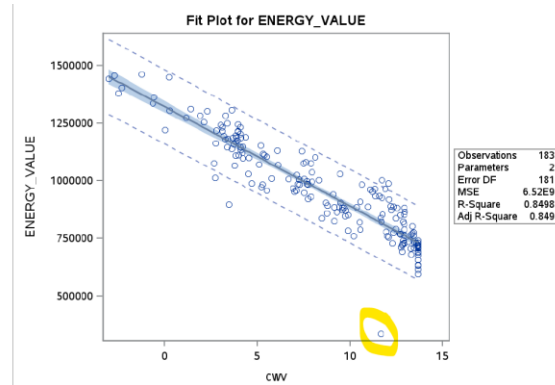
- Further investigation highlighted that this drop in consumption was due to the Queens funeral which was made a Bank Holiday.

- This data point is retained at this stage (as its genuine and not an error), however will be investigated as part of single year modelling results

Summary of Validated Data

Validated sample counts pre stratification – numbers provided are supply points

Notes:

- During the validation process it was apparent that the Market Sector Code (MSC) held on UK Link is not always reliable

  Accuracy of the EUC demand models and also EUC assignment will be impacted by these inaccuracies

- Sample numbers received from Shippers has reduced in bands 5 to 9, please ensure that your sample covers all EUCs within your portfolio and is sent on time

  A document highlighting common data errors can be found here.

EUC Bands: AQ Range Source data	2022/23 data		2021/22 data	
Band 1: 0 to 73.2 MWh pa Third party provided and Class 3 (Domestic Pre-Payment only)	Domestic	4,541	Domestic	4,918
	Non-Domestic	4,634	Non-Domestic	4,392
	Domestic Prepayment	3,863	Domestic Prepayment	2,599
	Non-Domestic Pre-payment	2	Non-Domestic Pre-payment	4
Band 2: 73.2 to 293 MWh pa Transporter-managed and Third party provided	Domestic	359	Domestic	188
	Non-Domestic	4,515	Non-Domestic	4,374
	Domestic Prepayment	1	Domestic Prepayment	0
	Non-Domestic Pre-payment	1	Non-Domestic Pre-payment	1
Bands 3 to 4: 293 to 2,196 MWh pa Transporter-managed and Third party provided	6,201		6,206	
Bands 5 to 9: > 2,196 MWh pa Transporter-managed and Third party provided	1,866		2,312	

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

SECTION 3: REVIEW OF SAMPLE DATASETS AVAILABLE FOR USE IN SMALL NDM MODELLING

Small NDM Population - AQ & Supply Point Count

- Small NDM is the main component of the overall NDM:

  - Band 1 (0-73.2 MWh pa) constitutes nearly 3/4 of overall NDM (on an AQ basis)

  - Bands 1 to 2 (0-293 MWh pa) constitutes nearly 4/5 of overall NDM

  - Bands 1 to 4 (0-2196 MWh pa) constitutes nearly 9/10 of overall NDM

- Large NDM is very much a minority component of overall NDM

EUC Bands: Range	% of Total NDM	
	Total AQ	Total SP Count
Band 1: 0 to 73.2 MWh pa	71.06%	98.99%
Bands 1 to 2: 0 to 293 MWh pa	77.41%	99.74%
Bands 1 to 4: 0 to 2,196 MWh pa	87.06%	99.97%
Bands 5 to 9: >2,196 MWh pa	12.94%	0.03%

Proposed EUC Bands / Consumption Ranges for Small NDM (<2,196 MWh pa)

- The EUC Bands and Consumption Ranges are not prescribed in Uniform Network Code and are the responsibility of DESC to agree ahead of each Gas Year
- The following summarises what DESC agreed as part of approving this year's Modelling Approach document:

Band 1: 0 – 73.2 MWh pa
- Prepayment Domestic
- Non Prepayment Domestic
- Prepayment I&C
- Non Prepayment I&C

Band 2: 73.2 – 293 MWh pa
- Prepayment Domestic
- Non Prepayment Domestic
- Prepayment I&C
- Non Prepayment I&C

Band 3: 293 – 732 MWh pa

Band 4: 732 – 2,196 MWh pa

Small NDM Consumption Bands: Review of EUC Band 1

EUC Bands: Range	Comments on 2022/23 data Proposed Modelling Runs	Final Modelling Runs for 2021/22
Band 1 PPM Domestic: 0 to 73.2 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis with SE combined with SO
Band 1 Non PPM Domestic: 0 to 73.2 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis for all LDZs
Band 1 PPM I&C: 0 to 73.2 MWh pa	Sample size issues - No model viable	Sample size issues - No model viable
Band 1 Non PPM I&C: 0 to 73.2 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis for all LDZs

Spreadsheet TW_B_SAMPLE_POP_SMALL_260423.xlsx provides sample numbers per LDZ for Bands 1 to 4 and any recommendations for additional runs

Small NDM Consumption Bands: Review of Bands 2-4

EUC Bands: Range	Comments on 2022/23 data Proposed Modelling Runs	Final Modelling Runs for 2021/22
Band 2 PPM Domestic: 73.2 to 293 MWh pa	Sample size issues - No model viable	Sample size issues - No model viable
Band 2 Non PPM Domestic: 73.2 to 293 MWh pa	Individual LDZ analysis except NO combined with SC, WN with NW and SW with WS	2 LDZ Group (SC/NO/NW/WN/NE/EM/WM & EA/NT/SE/WS/SO/SW)
Band 2 PPM I&C: 73.2 to 293 MWh pa	Sample size issues - No model viable	Sample size issues - No model viable
Band 2 Non PPM I&C: 73.2 to 293 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis for all LDZs
Band 3: 293 to 732 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis for all LDZs
Band 4: 732 to 2,196 MWh pa	Individual LDZ analysis for all LDZs	Individual LDZ analysis for all LDZs

Spreadsheet TW_B_SAMPLE_POP_SMALL_260423.xlsx provides sample numbers per LDZ for Bands 1 to 4 and any recommendations for additional runs

Recommendation

TABLE B.6 - SMALL NDM SUPPLY POINTS: 73.2 to 293 MWh pa (Band 2) Non Prepayment with MSC of Domestic (D)

LDZ	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	TOTAL
No. of Supply Points	27	22	32	28	32	28	15	17	31	41	39	27	20	359

Option 1

Individual LDZ analysis except NO combined with SC, WN with NW and SW with WS

Option 2

2 LDZ Group (North / South Split)

Recommendation

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 are allocated automatically to a WAR Band based on system calculation during AQ review

- 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 actual demand and the denominator is 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 2022/23)

- When setting WAR Thresholds, DESC's approach 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 Thresholds 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 Threshold per EUC band

Weather sensitive

Weather insensitive

W04

W01
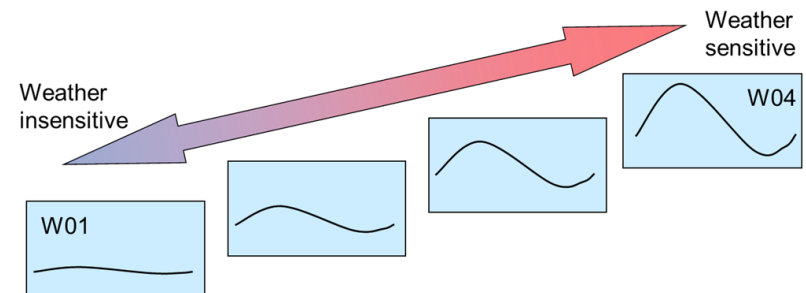
Movement in WAR Thresholds in 2023

- WAR Thresholds are affected by December to March weather experience:

  Winter 22/23 was generally COLDER than 2021/22, so thresholds would be expected to increase this year

- This is caused by a larger Winter consumption in proportion to the AQ which makes the WAR ratios shift up

Small NDM WAR Bands: Review of Bands 3-4

EUC Bands: Range	Comments on 2022/23 data Proposed Modelling Runs	Final Modelling Runs for 2021/22
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: 293 to 732 MWh pa	Individual LDZs for most except NO (+NE), WN (+NW) and WS (+SW)	Bands 3 and 4 were combined: Individual LDZ for most LDZs except WN being combined with NW
Band 4: 732 to 2196 MWh pa	Individual LDZs for most except SC (+NO), and WN (+NW)	

Spreadsheet TW_B_SAMPLE_POP_SMALL_260423.xlsx (Tables B.11 and B.12) for recommendation on aggregations and WAR Band thresholds

Recommendation

TABLE B.11 - SMALL NDM SUPPLY POINTS: 293 to 732 MWh pa (Band 3) WAR Bands

LDZ	No. of Supply Points			
	WAR Band 1 0.000-0.416	WAR Band 2 0.417-0.490	WAR Band 3 0.491-0.602	WAR Band 4 0.603-1.000
SC	57	127	141	28
NO / NE	**45** + 51	**70** + 64	**36** + 76	**18** + 31
NW	74	104	114	64
NE	51	64	76	31
EM	63	98	75	73
WM	62	78	95	55
WN / NW	**10** + 74	**10** +104	**6** + 114	**6** + 64
WS / SW	**21** + 48	**61** + 63	**76** + 61	**61** + 55
EA	51	67	66	67
NT	81	89	97	81
SE	60	109	95	89
SO	58	74	75	53
SW	48	63	61	55

Initial counts for LDZs with suggested aggregations (NO, WN and WS) are shown in bold with red text indicating where the sample count was insufficient

Individual LDZs or groups of 2 where required due to low sample count (NO, WN, and WS)

Recommendation

Recommendation

TABLE B.12 - SMALL NDM SUPPLY POINTS: 732 to 2,196 MWh pa (Band 4) WAR Bands

LDZ	No. of Supply Points			
	WAR Band 1 0.000-0.416	WAR Band 2 0.417-0.486	WAR Band 3 0.487-0.584	War Band 4 0.585-1.000
SC / NO	**67** + 48	**115** + 50	**117** + 53	**19** + 25
NO	48	50	53	25
NW	51	75	67	59
NE	64	56	66	52
EM	43	61	63	40
WM	46	71	71	49
WN / NW	**6** + 51	**14** + 75	**9** + 67	**6** + 59
WS	31	46	44	35
EA	29	62	70	44
NT	50	89	82	51
SE	52	87	90	81
SO	47	53	75	69
SW	30	67	35	30

Initial counts for SC and WN are shown in bold with red text indicating where the sample count was insufficient

Individual LDZs or groups of 2 where required due to low sample count (SC and WN)

Recommendation

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

SECTION 4: REVIEW OF SAMPLE DATASETS AVAILABLE FOR USE IN LARGE NDM MODELLING

Proposed EUC Bands / Consumption Ranges for Large NDM (>2,196 MWh pa)

- 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 Contingency Band for sites which should be DM)

Note:
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) could be merged for modelling purposes if necessary

EUC Bands: Range	% of Total NDM	
	Total AQ	**Total SP Count**
Band 1: 0 to 73.2 MWh pa	71.06%	98.99%
Bands 1 to 2: 0 to 293 MWh pa	77.41%	99.74%
Bands 1 to 4: 0 to 2,196 MWh pa	87.06%	99.97%
Bands 5 to 9: >2,196 MWh pa	12.94%	0.03%

- Large NDM remains very much a minority component of overall NDM

- Bands 5 to 9 (>2,196 MWh pa) constitutes approx. 1/10 of overall NDM (on an AQ basis)

Large NDM Consumption Bands: Review of Bands 5-9

EUC Bands: Range	Comments on 2022/23 data Proposed Modelling Runs	Final Modelling Runs for 2021/22
Band 5: 2,196 to 5,860 MWh pa	Individual LDZ for most LDZs except WN being combined with NW	Individual LDZ for most LDZs except WN being combined with NW
Band 6: 5,860 to 14,650 MWh pa	Individual LDZ analysis with WN combined with NW, and WS combined with SW	Individual LDZ analysis with WN combined with NW, and WS combined with SW
Band 7 and Band 8 (combined): 14,650 to 58,600 MWh pa	Individual LDZs with the following WS/SW, EA/NT, SE/SO and NW/WN combined	Individual LDZs with the following WS/SW, EA/NT, SE/SO and NW/WN combined
Band 9: >58,600 MWh pa	N/A – Band 7 and 8 data to be used	National

Spreadsheet TW_C_SAMPLE_POP_LARGE_260423.xlsx provides sample numbers per LDZ for Bands 5 to 9 and any recommendations for additional runs

Recommendation

TABLE C.1 - LARGE NDM SUPPLY POINTS: 2196 to 5860 MWh pa (Band 5)

LDZ	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	TOTAL
No. of Supply Points	179	78	101	85	84	100	12	48	60	108	112	81	38	1086

Individual LDZ for most LDZs except WN being combined with NW

Recommendation

Recommendation

TABLE C.2 - LARGE NDM SUPPLY POINTS: 5860 to 14650 MWh pa (Band 6)

LDZ	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	TOTAL
No. of Supply Points	67	34	48	53	45	31	4	16	24	32	32	35	33	454

Option 1

Individual LDZ for most LDZs except
WN being combined with NW and
WS combined with SW

Recommendation

Option 2

Individual LDZ for most LDZs except
EA combined with NT and
WN being combined with NW and
WS combined with SW

Recommendation

TABLE C.3 - LARGE NDM SUPPLY POINTS: 14650 to 58600 MWh pa (Band 7 & 8)

LDZ	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	TOTAL
No. of Supply Points	38	33	32	42	61	28	4	14	18	12	19	11	14	327

Option 1

Individual LDZ for most LDZs except WS combined with SW, EA combined with NT, SE combined with SO and NW combined with WN

Recommendation

Option 2

2 LDZ Group (North / South Split)

Large NDM WAR Bands: Review of Bands 5-8

EUC Bands: Range	Comments on 2022/23 data Proposed Modelling Runs	Final Modelling Runs for 2021/22
Band 5: 2,196 to 5,860 MWh pa	SC at Individual LDZ, Others in groups of 2 (for 7 LDZs) or 3 (for 5 LDZs) LDZs	5 LDZ group
Band 6: 5,860 to 14,650 MWh pa	Combined for Modelling purposes: Individual LDZs (for 5 LDZs) or groups of 2 LDZs (for 8 LDZs)	3 LDZ group (SC/NO/NW/WN, NE/EM/WM & EA/NT/SE/WS/SO/SW)
Band 7 and Band 8 (combined): 14,650 to 58,600 MWh pa		2 LDZ group (SC/NO/NW/WN/NE/EM/WM & EA/NT/SE/WS/SO/SW)
Band 9: >58,600 MWh pa	N/A - No WAR Bands	

Spreadsheet TW_C_SAMPLE_POP_LARGE_260423.xlsx provides sample numbers per LDZ for Bands 5 to 8 and any recommendations for additional runs

Recommendation

TABLE C.5 - LARGE NDM SUPPLY POINTS: 2,196 to 5,860 MWh pa (Band 5) WAR Bands

LDZ	No. of Supply Points			
	WAR Band 1 0.000-0.358	WAR Band 2 0.359-0.444	WAR Band 3 0.445-0.525	War Band 4 0.526-1.000
SC	32	58	58	31
NO / NE	**17** + 25	**23** + 24	**24** + 23	**14** + 13
NW / NO	**27** + 17	**29** + 23	**26** + 24	**19** + 14
NE / NO	**25** + 17	**24** + 23	**23** + 24	**13** + 14
EM / WM	**26** + 27	**20** + 32	**17** + 18	**21** + 23
WM / EM	27 + 26	32 + 20	**18** + 17	**23** + 21
WN / NW / NO	**2** + 44	**0** + 52	**8** + 50	**2** + 33
WS / SW / SO	**11** + 20	**14** + 40	**12** + 29	**11** + 30
EA / NT / SE	**8** + 21	**22** + 65	**19** + 92	**11** + 42
NT / EA / SE	**6** + 23	**30** + 57	**49** + 62	**23** + 30
SE / SO	**15** + 13	**35** + 27	**43** + 21	**19** + 20
SO / SE	**13** + 15	**27** + 35	**21** + 43	**20** + 19
SW / WS / SO	**7** + 24	**13** + 41	**8** + 33	**10** + 31

Initial counts for LDZs with suggested aggregations are shown in bold with red text indicating where the sample count was insufficient

Individual LDZs or groups of 2 or 3 where required due to low sample count

Recommendation

Recommendation

TABLE C.6 - LARGE NDM SUPPLY POINTS: 5,860 to 58,600 MWh pa (Bands 6 to 8) WAR Bands

LDZ	No. of Supply Points			
	WAR Band 1 0.000-0.328	WAR Band 2 0.329-0.409	WAR Band 3 0.410-0.506	War Band 4 0.507-1.000
SC	50	76	113	45
NO	41	34	42	28
NW	36	65	45	35
NE / NO	58 + 41	59 + 34	40 + 42	23 + 28
EM	61	65	29	35
WM	36	48	41	34
WN / NW	4 + 36	5 + 65	7 + 45	4 + 35
WS / SW	10 + 17	32 + 32	21 + 16	15 + 20
EA / NT	16 + 11	28 + 33	34 + 68	24 + 40
NT / EA	11 + 16	33 + 28	68 + 34	40 + 24
SE / SO	17 + 19	44 + 37	66 + 39	36 + 32
SO / SE	19 + 17	37 + 44	39 + 66	32 + 36
SW / WS	17 + 10	32 + 32	16 + 21	20 + 15

Initial counts for LDZs with suggested aggregations are shown in bold with red text indicating where the sample count was insufficient

Reminder: Bands 6 to 8 WAR Bands use sample data for Bands 5 to 8 (as agreed as DESC 1st March 2023)

Individual LDZs or groups of 2 where required due to low sample count

Recommendation

2.0 Collection of Daily Gas Consumption Data for EUC Modelling

SECTION 5: NEXT STEPS

Next Steps

April to June 2023

01) Demand Estimation Team to commence EUC demand modelling based on today's decisions
26/04/2023

02) Demand Estimation Team to share EUC demand modelling results for DESC to review

wc 15/05/2023

03) DESC meeting where EUC demand modelling results will be presented and discussed

24/05/2023

04) Demand Estimation Team to prepare draft profiles for Gas Year 2023/24

25/05/2023 to 09/06/2023