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Demand Estimation Sub Committee

3.0 Ad Hoc Workplan Update

6 March 2024

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DESC Ad Hoc Workplan

OVERVIEW

Demand Estimation Cycle



- 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 Model Review phase of the Demand Model cycle

CDSP / DESC Obligations and Timetable: October 2023 to September 2024

Milestone	UNC H Ref	2023			2024								
		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 2022/23	1.8			✓								✓	
DESC Ad Hoc 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											✓	
Seasonal Normal Review 2025	1.4	✓		✓			✓		✓		✓		

Background

DESC's annual timetable of work naturally falls into 2 phases and time periods:

- 1. April to September:** Core modelling work for next Gas Year's Demand Profiles – this is fitted around defined industry timescales with limited flexibility
 - Relevant DESC meetings are in April, May and 2 in July
 - 2. October to March:** Review of previous Gas Year's Demand Profiles, Ad hoc Workplan and Preparation for Modelling – this period has more flexibility in how the time is utilised
 - Relevant DESC meetings are in October, December and March
- DESC have the responsibility of reviewing the proposed set of activities within the Ad hoc Workplan, in addition to the standard work plan items
 - Standard workplan items are regular scheduled activities
 - Ad Hoc workplan items are one off pieces of analysis

Objective

- To provide final update on the progress made against each of the workplan items we agreed with DESC in July 2023

The update is split into:

- Standard Workplan Items (annual/scheduled activities) and
- Ad Hoc Workplan Items (one-off pieces of analysis)

Ad Hoc Workplan Update

STANDARD WORKPLAN ITEMS – PROGRESS UPDATE

Autumn Winter 23/24 – Standard Workplan Items (1 of 2)

- NDM Algorithm Performance for Gas Year 2022/23
 - Strand 1 – Weather Analysis
 - Strand 2 – Unidentified Gas (UIG) Analysis
 - Strand 3 – NDM Daily Demand Analysis
 - **Completed** – Analysis reported at [December 23 DESC](#)
- Modelling Approach 2024 – Agreement on methodology for deriving Demand Profiles for Gas Year 2024/25
 - **Completed Pending Approval** - Reported at [December 23 DESC](#) and March 24 DESC
- Managing Daily Gas Consumption Data submissions – (DN’s sample and MOD 654S eligible Shipper data)
 - **Completed** - Reported at [December 23 DESC](#) and March 24 DESC

Autumn Winter 23/24 – Standard Workplan Items (2 of 2)

There are a number of Weather related workplan items due to be delivered during this period

- Manage Daily Weather Data Service Provider contract as CDSP transitions from 'file format delivery' to API platform solution
 - **Completed** – Contract with Weather Service Provider in place from September 2023
- Supporting transition from 'file format delivery' to API platform solution to poll daily weather data for Demand Estimation processes – due to go live in November
 - **Completed** – Transition to polling DTN APIs for weather data to support CWV calculation implemented over weekend of 19th – 22nd January 2024 following a successful dual-run phase in December 2023
- Seasonal Normal Review 2025
 - Progress Climate Change Methodology procurement
 - Preparation of Approach and Solution for delivering CWV Formula Review
 - **In Progress** (covered in slide pack 5.0)

Managing Daily Gas Consumption Data Submissions Update – Preparation For April Modelling

- The deadline for eligible Shippers for the April submission of NDM sample data is close of play on Monday 8th April 2024
- A 12 month period this year will capture the whole Easter period, therefore data is required for 01/04/2023 to 31/03/2024
- The Performance Assurance Framework Administrator (PAFA) write to all Shippers who didn't submit any data in October. Your organisation may have received a letter, reminding you of your obligations and asking you to make sure that you submit data during the April window
- An updated guidance and file format document is available on the Joint Office website [here](#)

Managing Daily Gas Consumption Data Submissions

Update – DN Targets

- At the December 23 DESC meeting we mentioned that a review would take place for the target sample numbers for each Distribution Network. This was to be undertaken as the figures had not been reviewed since around 2006
- A snapshot of the population was taken in December 2023 and a 95% confidence level calculation was used to determine the new target numbers:

$$\frac{Z^2 * P(1 - P)}{\varepsilon^2} = 385$$

Where:

- Confidence Level value of 95% equates to a (z) value of 1.96
- Margin of error (ε) is set to 5%
- Sample proportion (P) is set to 0.5
- Assumptions:
 - 1) The sample is random
 - 2) The distribution is normal

- This is the same calculation used to determine the target numbers used for modelling and algorithm performance

Managing Daily Gas Consumption Data Submissions

Update – DN Targets

- The obligation for Distribution Networks in UNC Section H1.6 requires sample data to be submitted for EUC Bands 2-8 only
- Population as of 01/12/2023:

EUC Band	NW	WM	EM	EA	NT	NO	NE	WN	WS	SW	SC	SO	SE	Total
2	15,923	12,332	13,442	11,016	16,682	7,128	8,692	1,653	4,396	9,421	11,784	11,189	14,518	138,176
3	4,633	3,623	3,743	3,231	5,479	2,242	2,301	418	1,189	2,433	4,144	3,128	4,210	40,774
4	1,722	1,543	1,475	1,266	2,642	812	947	219	527	909	1,792	1,237	1,544	16,635
5	467	401	387	268	674	204	243	46	135	192	429	241	335	4,022
6	171	126	172	115	184	75	93	23	49	91	121	88	92	1,400
7	77	52	86	45	39	31	37	12	24	44	54	31	24	556
8	43	31	51	26	19	13	19	7	15	19	16	14	18	291
Total	23,036	18,108	19,356	15,967	25,719	10,505	12,332	2,378	6,335	13,109	18,340	15,928	20,741	201,854

- Current target numbers:

EUC Band	NW	WM	EM	EA	NT	NO	NE	WN	WS	SW	SC	SO	SE	Total
2	85	80	75	85	160	55	55	10	30	55	55	35	100	880
3	150	80	130	120	185	95	80	20	75	100	110	85	165	1,395
4	450	335	445	445	480	270	340	50	175	260	425	360	520	4,555
5	445	415	340	275	515	235	250	55	130	240	420	280	355	3,955
6	186	177	148	110	157	83	104	20	61	90	116	85	94	1,431
7	45	66	64	31	26	24	45	7	21	32	34	35	20	450
8	25	32	25	8	5	16	10	3	10	8	14	8	10	174
Total	1,386	1,185	1,227	1,074	1,528	778	884	165	502	785	1,174	888	1,264	12,840

Managing Daily Gas Consumption Data Submissions

Update – DN Targets

- New target numbers:

EUC Band	NW	WM	EM	EA	NT	NO	NE	WN	WS	SW	SC	SO	SE	Total
2	75	75	75	74	75	73	74	62	71	74	75	74	75	952
3	356	348	349	344	360	329	330	201	291	332	352	343	353	4,288
4	315	308	305	295	336	261	274	140	223	271	317	294	308	3,647
5	211	197	193	158	245	134	149	41	100	128	203	148	179	2,086
6	119	95	119	89	125	63	75	22	44	74	92	72	74	1,063
7	64	46	70	40	35	29	34	12	23	40	47	29	23	492
8	39	29	45	24	18	13	18	7	14	18	15	14	17	271
Total	1,179	1,098	1,156	1,024	1,194	902	954	485	766	937	1,101	974	1,029	12,799

- Difference

EUC Band	NW	WM	EM	EA	NT	NO	NE	WN	WS	SW	SC	SO	SE	Total
2	-10	-5	0	-11	-85	18	19	52	41	19	20	39	-25	72
3	206	268	219	224	175	234	250	181	216	232	242	258	188	2,893
4	-135	-27	-140	-150	-144	-9	-66	90	48	11	-108	-66	-212	-908
5	-234	-218	-147	-117	-270	-101	-101	-14	-30	-112	-217	-132	-176	-1,869
6	-67	-82	-29	-21	-32	-20	-29	2	-17	-16	-24	-13	-20	-368
7	19	-20	6	9	9	5	-11	5	2	8	13	-6	3	42
8	14	-3	20	16	13	-3	8	4	4	10	1	6	7	97
Total	-207	-87	-71	-50	-334	124	70	320	264	152	-73	86	-235	-41

- Please note, for EUC Band 2 the target numbers are reduced by 80%. This is because we also receive a significant number of Band 2 sites from Shippers which results in us removing c1.6k sites that have passed all validation.

Managing Daily Gas Consumption Data Submissions Update – DN Targets

- Once the revised target numbers are confirmed with the CDSP we shall engage with the relevant NDM sample providers so they can start working towards the new targets
- Prior to this the CDSP would welcome any questions from DESC on the approach taken and proposed target numbers

- Are DESC happy with the approach proposed by the CDSP ?

Input
Required

Ad Hoc Workplan Update

AD HOC WORKPLAN ITEMS – PROGRESS UPDATE

Autumn Winter 23/24 – Ad Hoc Workplan Items

- In addition to the standard workplan items the following ad hoc workplan items were agreed at the July DESC meeting:
- Model Smoothing Review
 - **Completed** – Analysis reported at the [December 23 DESC](#)
- Review Day of Week Demand Behaviours
 - **Completed Pending Approval** - [Agenda item 3.1](#)
- Review Impact of Flexible Power Generation on UIG
 - **Limited Progress**

Review Impact of Flexible Power Generation on UIG

- **Objective:** Investigate NDM modelling error for these sites and impacts to UIG
- An update on flexible power generation was presented at [December DESC](#) meeting:
 - We confirmed large proportion of Flexible Generation sites in Class 3 & 4 have insufficient data
 - Analysis of Class 1 and 2 sites was suggested to explore this topic further
- Extraction of data has taken place for Class 1 and 2 sites, however analysis has yet to be completed in readiness for an update to DESC
- Overall, limited progress has been made on this item during the Autumn/Winter period
- As we enter the core modelling phase (April to September), there will be other priorities for the team, however we suggest this is retained as an open workplan item and we will feed back to DESC as and when possible

Ad Hoc Workplan Update

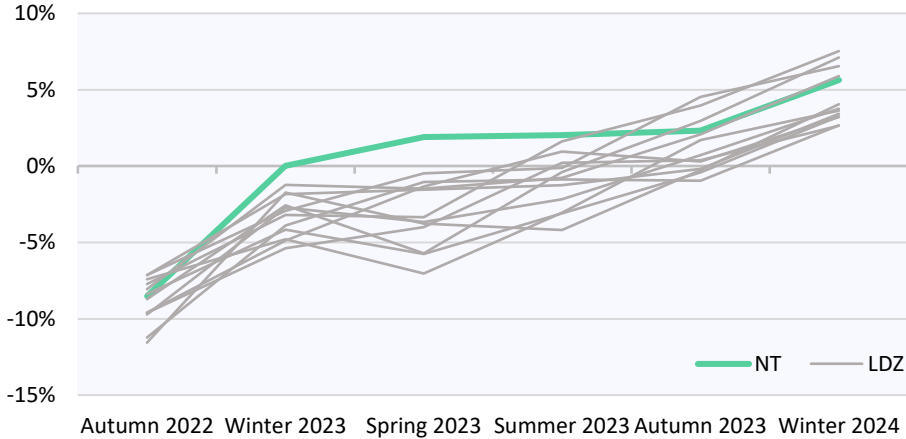
YOU SAID, WE DID

“You Said, We Did”

- During the Autumn/Winter Ad Hoc Workplan phase the team have noted a few observations offered by DESC members, which, although minuted, were not captured as formal actions
- As we conclude this phase, we would like to take this opportunity to provide updates on the DESC observations after performing some additional analysis
- DESC Comment: Regarding Strand 2 – Unidentified Gas (UIG) Analysis
 - Why is NT UIG behaving differently compared to the other LDZs?
 - Is this down to the Weather Station not being representative?
- DESC Comment: Regarding Strand 3 - NDM Daily Demand Analysis
 - Is a sample of c.29k sites really a good representation of 25m supply points?
 - Are the results only good because we use the same sites to model and then assess the Algorithm Performance?

NT Review

LDZ Quarterly UIG

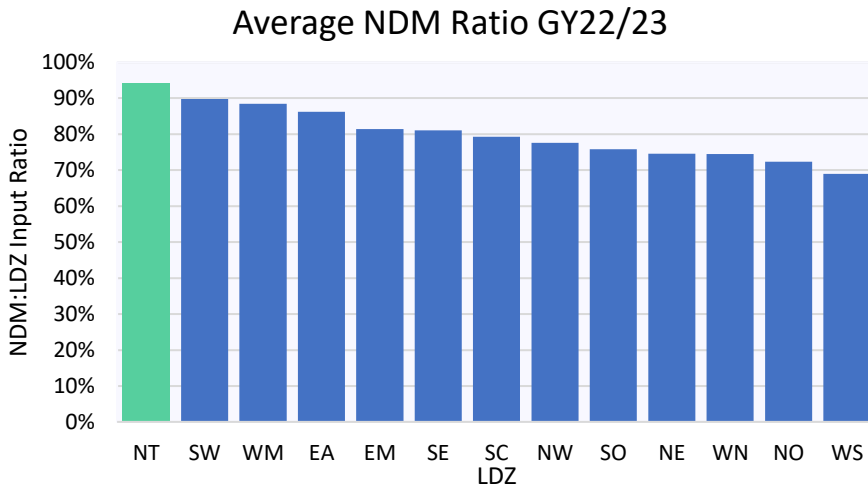
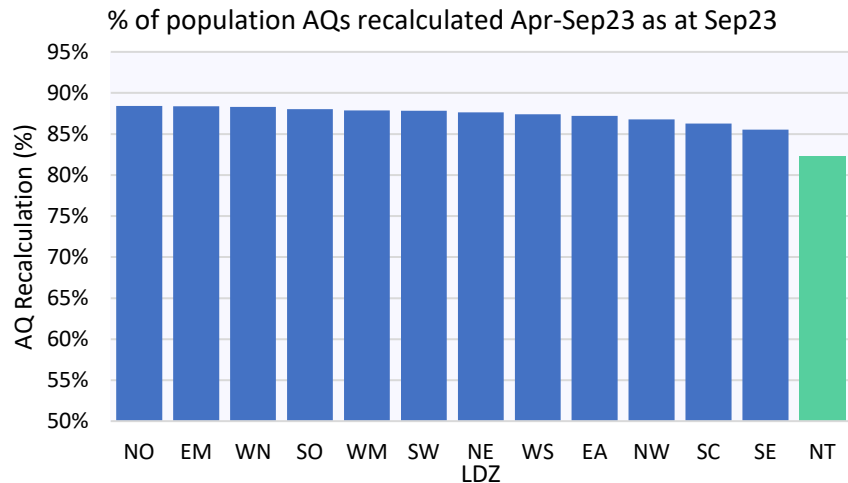


- Strand 2 UIG analysis revealed that UIG for NT performed differently by running more positive than other LDZs during Winter & Spring 2023
- All LDZ UIG became positive in Winter 2024 with NT values now comparable to the other LDZs

LDZ	NT	EA	EM	NE	NO	NW	SC	SE	SO	SW	WM	WN	WS
Autumn 2022	-8.52%	-9.71%	-8.37%	-7.73%	-8.07%	-8.70%	-7.14%	-11.22%	-7.14%	-11.57%	-9.60%	-7.41%	-9.61%
Winter 2023	0.01%	-2.72%	-4.16%	-3.19%	-1.22%	-2.57%	-2.92%	-3.90%	-1.83%	-1.73%	-4.88%	-4.79%	-5.37%
Spring 2023	1.90%	-3.67%	-5.75%	-3.35%	-1.48%	-5.72%	-0.48%	-1.03%	-1.54%	-3.76%	-1.34%	-7.04%	-4.00%
Summer 2023	2.02%	-2.18%	-3.10%	1.63%	-0.76%	-0.39%	-0.11%	-0.88%	-1.24%	-4.18%	0.94%	-3.05%	0.22%
Autumn 2023	2.33%	0.73%	-0.42%	3.96%	2.09%	2.97%	4.54%	-0.95%	-0.18%	-0.26%	0.30%	1.70%	0.39%
Winter 2023	5.64%	3.75%	3.26%	7.52%	5.90%	7.11%	6.54%	2.66%	3.43%	4.06%	3.21%	3.63%	2.64%

NT Review

- Possible drivers for UIG differences observed in Gas Year 2022/23 are considered below
- Based on a snapshot from Sep 23, NT had a lower number of MPRNs that had a recalculated AQ effective between Apr-Sep23 than the other LDZs.
- NT has the highest NDM:LDZ input ratio
- Spring & Summer maintains a high NDM:LDZ ratio



- Although we have observed NT has different characteristics to the other LDZs these do not explain the UIG behaviour

NT Review - Summary

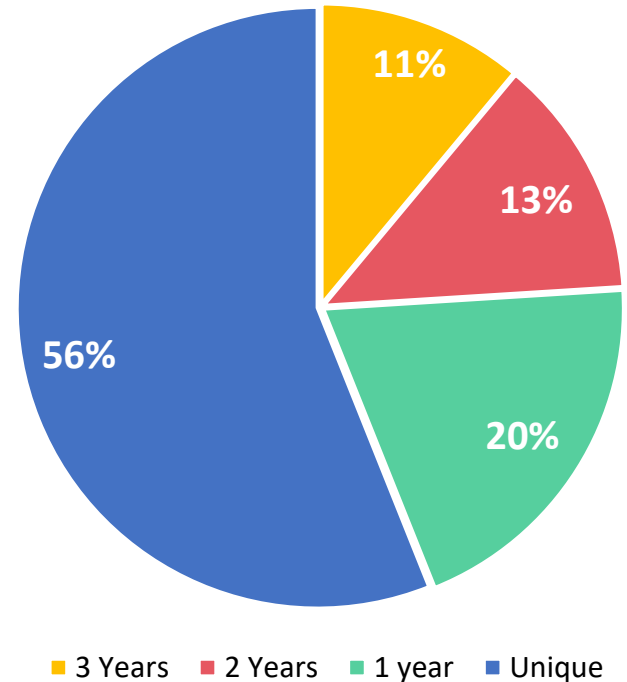
- UIG in NT has continued to be positive throughout the start of Gas Year 2023/24, however is no longer standing out as different to the other LDZs
- NT shares Heathrow Weather station with LDZs EA & SE
 - Heathrow is located in NT
- CWV and aggregated demand relationship was strongest in NT
 - The table on the right shows the relationship (R^2) between aggregate demand and CWV for Gas Year 2022/23
- There does not appear to be an ongoing difference in UIG levels between NT and the other LDZs
- Strand 2 UIG Analysis scheduled for later this year will naturally cover this topic again

LDZ	GY22/23
NT	0.9945
SO	0.9934
SE	0.9933
WM	0.9927
SC	0.9922
SW	0.9922
EA	0.9921
EM	0.9920
NW	0.9915
NO	0.9912
WN	0.9880
WS	0.9878
NE	0.9874

MPRN Representation -Modelling and Algorithm Performance

- We have reviewed the sample data used in Strand 3 analysis for Gas Year 2022/23 to check how many MPRNs were also used as an input to the demand modelling process:
 - 56% of the MPRNs used in the 2023 Algorithm Performance were **unique** to the Algorithm Performance and not used in the modelling process
 - 11% of the sample MPRNs used in the Algorithm Performance were also used in **all 3 years** of the modelling process
 - 13% of the sample MPRNs used in the Algorithm Performance were also used in **2 years** of the modelling process
 - 20% of the sample MPRNs used in the Algorithm Performance were also used in **1 year** of the modelling process
- We shall look to include similar breakdowns of the MPRN usage across the 'training' (Model creation) and 'testing' (Algorithm Performance) of the EUC demand models in future updates to DESC

Algorithm and Modelling MPRN



Conclusions

- Overall, the majority of workplan items set out in July last year have been completed within the Autumn/Winter period
- Seasonal Normal Review 2025 will continue all this year, but the key planned deliverables during the Autumn/Winter period of procuring a Service Provider for the Climate Change Methodology and agreeing the approach to CWV Optimisation was achieved
- Investigation into the NDM modelling error for Flexible Power Generation Sites and the impacts to UIG is the only item which has not fully progressed. If possible, this item will be worked on during the core modelling phase otherwise can be re-assessed as an Ad hoc workplan item in July. We'd welcome any independent analysis that DESC members are able to bring on this topic
- The Demand Estimation Team will now focus on the core modelling work needed for Gas Year 2024/25 NDM Profiles