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Demand Estimation Sub Committee

2.2 CWV Optimisation Update
Seasonal Normal Review 2025

12 September 2024

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- Background, Overview and Objectives
- Update on Composite Weather Variable (CWV) Formula review
- Next steps

Background

- DESC are responsible for a number of obligations in Section H of UNC, amongst them are the requirements to:
 - Review the Composite Weather Variable (CWV) (H 1.4.3) and
 - Review the Seasonal Normal equivalent referred to as the SNCWV (H 1.5.3)
- Reviews of the CWV formula and Seasonal Normal basis are normally only carried out by DESC every 5 years due to the time taken to perform the review and the need for stability
- The latest DESC review in 2019 derived a new CWV formula and new basis for the Seasonal Normal, which both came into effect from the 01 October 2020
- This means the next Seasonal Normal basis is scheduled to take effect from 01 October 2025 with the detailed analysis performed during 2024

Seasonal Normal Review

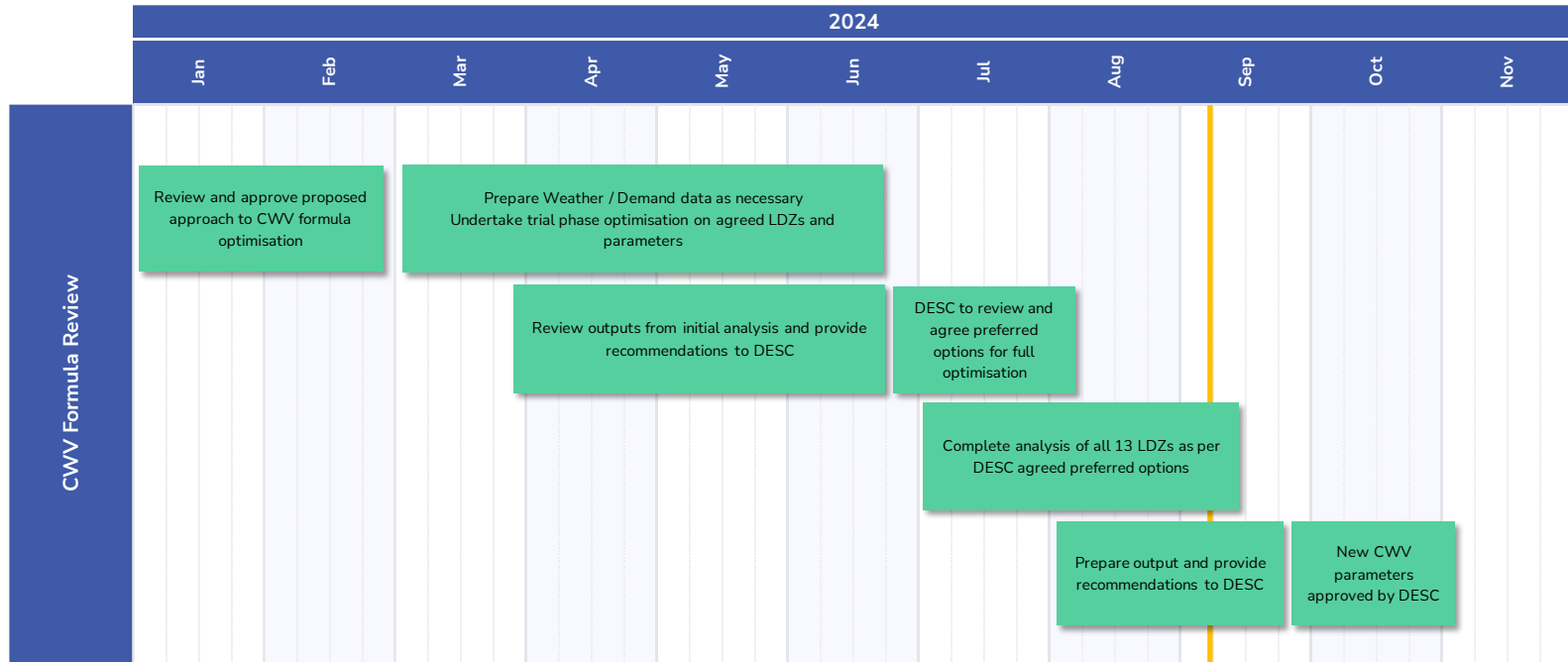


- An overview of the Demand Estimation process and output can be found [here](#)
- Composite Weather Variable (CWV) and Seasonal Normal CWV (SNCWV) are key inputs to the Demand estimation process
- Seasonal Normal Review (SNR) cycle, undertaken at minimum once every 5 years, represented in diagram opposite
- This presentation relates to updates on the **CWV Defined and Calculated** phase of the SNR cycle

Objectives

- Provide an update on latest position of CWV optimisation, including any feedback from the trial optimisation results presented at July's DESC meeting
- Provide update on the next steps of CWV optimisation.

CWV Optimisation Update



- Following feedback on the trial optimisation results, the optimisation process will be completed for all LDZs which is due to be presented for DESC approval on 8 October

Reminder of CWV Formula

- Reminder of the CWV formula which is designed to provide a linear fit to aggregate NDM gas demand

$$CW_t = I_1 * E_t + (1.0 - I_1) * S_t - I_2 * \text{Max}(0, W_t - W_0) * \text{Max}(0, T_0 - AT_t) + S_0 * SR_t + P_0 * P_t$$

$$CWV_t = V1 + q * (V2 - V1)$$

if $V_2 \leq CW_t$ (summer cut-off)

$$CWV_t = V1 + q * (CW_t - V1)$$

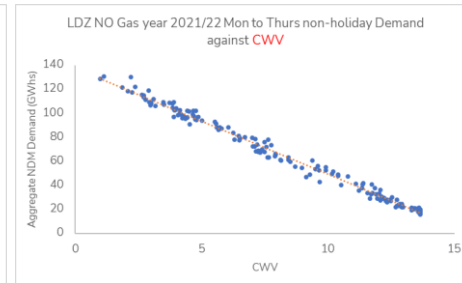
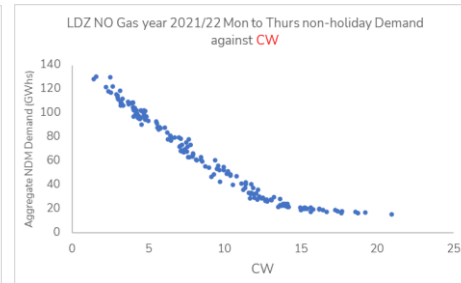
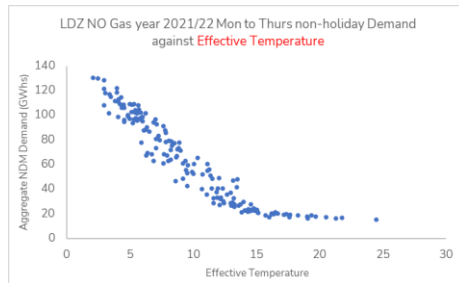
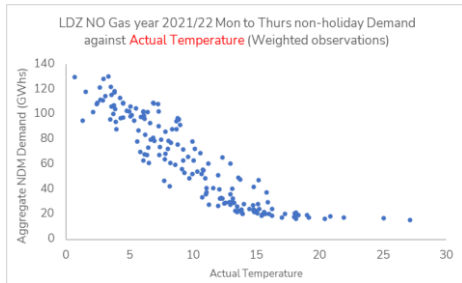
if $V_1 < CW_t < V2$ (transition)

$$CWV_t = CW_t$$

if $V_0 \leq CW_t \leq V1$ (normal)

$$CWV_t = CW_t + I3 * (CW_t - V0)$$

if $V_0 > CW_t$ (cold weather upturn)



- DESC approved the [approach to the CWV Formula review](#) in Q1 2024.
- At DESCs meeting on [July 24 2024](#), results from a trial phase of optimisation were presented for LDZs North West (NW), Scotland (SC), and South East (SE).

Trial Results – LDZ SC – Day of week

- Following feedback from DESC meeting in July 2024, the following analysis will be included in the final optimisation results for all LDZs

Day of Week	MAPE - LDZ SC			RMSE (MWH) - LDZ SC		
	2020	2025	Movement	2020	2025	Movement
Monday	5.39%	5.19%	-0.20%	6110	5984	-126
Tuesday	5.42%	5.36%	-0.06%	6469	6389	-80
Wednesday	6.55%	6.34%	-0.22%	7168	7015	-153
Thursday	5.58%	5.32%	-0.26%	6303	6162	-141
Friday	6.18%	5.99%	-0.19%	6941	6802	-139
Saturday	10.38%	10.32%	-0.06%	10647	10583	-64
Sunday	9.63%	9.53%	-0.10%	9962	9905	-57

- In the example for LDZ SC, the Monday to Thursday regression model has been applied to all Gas Days within the analysis period of Gas Years 2015/16 to 2022/23.

- An improvement in the MAPE and RMSE has been observed across all days of the week. While Fridays show a good fit, results for Saturday and Sunday are worse than the core Monday to Thursday modelled days, as expected. Note: these results should still be considered as 'Trial' and are subject to change in the final optimisation summary.
- Reminder: as per agreed approach, the optimisation models are performed only on Mon-Thurs Non holiday Gas Days. Weekend effects are captured within the profiles produced via NDM Demand Modelling.
- No other feedback has been received on the format of CWV optimisation results for next month's review and approval meeting.

Next Steps



- Note: CWV optimisation results presented on 8 October will contain a lot of detail. We will look to provide summary results and a selection of LDZ results for the meeting along with an Appendix, which we can refer to in the event of comments following your pre-meeting review.