SECTION 12 - EVALUATION OF ALGORITHM PERFORMANCE

1. BACKGROUND

One of the responsibilities of the Demand Estimation Sub Committee (DESC) is to provide a summary of the NDM Algorithm Performance in the preceding year. UNC requirement 'H 1.8.1 (d)' states "DESC will submit to all parties a summary of the Committee's analysis of the performance in the Preceding Year of the End User Categories and Demand Models (applicable in the Preceding Year)".

The analysis is completed once a year in the Autumn, following completion of the gas year and Xoserve performs this role as the common demand estimation service provider.

The implementation of Project Nexus on 1st June 2017 introduced a revised NDM Supply Meter Point Demand formula, meaning some of the original Algorithm Performance measures became redundant. At the DESC meeting on 15th November 2016, the group reviewed four proposed strands of analysis which would help assess the accuracy of the estimated allocations derived by the revised formula. These analysis strands are as follows:

Strand 1 – Weather Analysis

Strand 2 – Unidentified Gas Analysis

Strand 3 – NDM Daily Demand Analysis

2. NDM SUPPLY METER POINT DEMAND FORMULA

The revised NDM Supply Meter Point Demand formula (effective from 1st June 2017) used for estimating NDM daily demand is shown below:

$SPD_t = ((AQ/365) \times ALP_t \times (1 + (DAF_t \times WCF_t)))$

where:

AQ = Annual Quantity

ALP_t = Annual Load Profile

DAF_t = Daily Adjustment Factor ($WVCE_t$ / $SNDE_t$)

WCF_t = Weather Correction Factor (CWV_t – $SNCWV_t$)

In addition to the revised demand formula, 1st June 2017 also saw the introduction of Unidentified Gas or UiG. UiG forms part of daily gas allocation and is calculated as the balancing figure to ensure that within in each LDZ, total input matches total output. UiG is derived as follows:

Total LDZ Energy – (Shrinkage + DM Energy + Total LDZ NDM Energy) = UiG

3. STRAND 1: WEATHER ANALYSIS

When interpreting the various strands of Algorithm Performance, it is relevant to recall the weather conditions that prevailed during the gas year being analysed.

The Composite Weather Variable (CWV) is a single measure of daily weather in each LDZ and is a function of actual temperature, wind speed, effective temperature and seasonal normal effective temperature. Further detail on the computation of the CWV can be found in Section 11 of the NDM Algorithm Booklet.

The SNCWV is the Seasonal Normal value of the Composite Weather Variable for the LDZ for the day.

The Weather Correction Factor (WCF) represents the difference between the CWV and the SNCWV for the LDZ and Gas Day.

Please note that in order to derive the weather charts and summaries depicting a national view of weather, 'GB CWV' and 'GB SNCWV' values have been derived using weightings based on LDZ throughput over the five year period 2009 to 2013.

A selection of weather related charts are presented below: Figures S12.1.1 to S12.1.12 are bar charts showing the national monthly average CWV for each specific month, ranked coldest to warmest over the past 50 years. Figures S12.1.13 to S12.1.24 are charts showing the national daily average CWV values for each specific month and how they compare to SNCWV. Figures S12.1.25 to S12.1.36 show daily observed CWV values compared to SNCWV, across each LDZ for the gas year as a whole.

A monthly weather summary for each individual month in the relevant gas year is provided below:

October 2018 was marginally warmer than the current seasonal normal overall, ranking as the 24th warmest October over the past 50 years. Most of the individual days throughout the month were warmer than normal but got notably cooler at the end of the month. CWV deviation from SNCWV across all days in October 2018 ranged from +3.18 to -3.99.

November 2018 was warmer than the current seasonal normal overall and ranked 11th warmest over the past 50 years. Most of the individual days were warmer than normal with but with a cold spell from 19th to the 27th. CWV deviation from SNCWV across all days in November 2018 ranged from +2.8 to -2.35.

December 2018 was warmer than the current season normal overall and ranked as the 4th warmest December over the past 50 years. Despite a cooler period from 12th to the 16th, all the other individual days were warmer than normal. CWV deviation from SNCWV across all days in December 2018 ranged from +3.13 to -3.21.

January 2019 was marginally warmer than the current season normal overall and ranked as the 23rd warmest January over the past 50 years. The month started with warmer than normal days but was mostly colder days at the end of the month. CWV deviation from SNCWV across all days in January 2019 ranged from +2.22 to -4.28.

February 2019 was much warmer than the current seasonal normal and ranked as the 2nd warmest February in the past 50 years. All but 5 individual days throughout February 2019 were warmer than normal. CWV deviation from SNCWV across all days in February 2019 ranged from +3.46 to -4.32.

March 2019 was also much warmer than the current seasonal normal overall which resulted in it being ranked as the 6th warmest March in the last 50 years. The warmer than normal weather from the end of February continued throughout most of March for all but 5 days. CWV deviation from SNCWV across all days in March 2019 ranged from +2.97 to -1.27.

April 2019 was slightly warmer than the current seasonal normal overall and ranked as the 14th warmest April in the past 50 years. April 2019 started off cooler but had a spell of warmer weather from the 17th to the 26th. CWV deviation from SNCWV across all days in April 2019 ranged from +4.15 to -2.52.

May 2019 was slightly warmer than the current seasonal normal, ranking as the 23rd warmest May in the past 50 years. As per April 2019, May started off and ended slightly cooler than normal but was warmer overall. CWV deviation from SNCWV across all days in May 2019 ranged from +1.18 to -2.04.

June 2019 was marginally colder than seasonal normal overall ranked as the 27th coldest June in the past 50 years. Most of the individual days throughout the month were very similar to seasonal normal, with a cold period from 8th to the 16th. CWV deviation from SNCWV across all days for June 2019 ranged from +1.08 to -1.88.

July 2019 saw the warm summer weather return with the month being warmer than normal overall, ranking as the 6th warmest July over the past 50 years. Each of the individual days throughout the month were warmer than normal. CWV deviation from SNCWV across all days in July 2019 ranged from +0.31 to +0.00.

August 2019 was slightly warmer than the current seasonal normal overall and ranked as the 11th warmest August over the past 50 years. CWV deviation from SNCWV across all days in August 2019 ranged from +0.45 to -0.54.

September 2019 was also warmer than the current seasonal normal overall, ranking as the 10th warmest September in the last 50 years. Many of the individual days at the start of the month were colder than normal but days became warmer towards the end. The CWV deviation from SNCWV across all days in September 2019 ranging from +0.91 to -1.08.

Overall, gas year 2018/19 was generally warmer than the current seasonal normal with several days throughout the year where the CWV reached the maximum cut off value.

Confidence interval analysis has been performed on the observed WCF values during Gas Year 2018/19. The confidence intervals were calculated for each month and LDZ based on five years of historic WCF data from Gas Years 2011/12, 2012/13, 2013/14, 2014/15 & 2015/16. The 95% confidence interval has been calculated by using the mean and standard deviation over the five years listed and these intervals can be used to identify when the WCF is regarded as unusual. Figures S12.1.37 to S12.1.48 are line charts showing the observed WCF during Gas Year 2018/19 for each LDZ, compared to the upper and lower confidence intervals.

Figure S12.1.49 is a table showing the percentage of daily WCF values which fall within the confidence intervals for each LDZ and Month combination. In assessing this table, the months of October 2018, April and June 2019 stand out, with the number of daily WCF values within the derived confidence intervals being less than 95% in all 13 LDZs (11 LDZs in June 19). As previously stated, February and March 2019 were both much warmer than current seasonal normal overall, with most individual days also being warmer than normal. In contrast, June 2019 was cooler than current seasonal normal overall with several of the days throughout the month being cooler than normal.

Figure S12.1.1 – 50 Year GB CWV Ranking – October

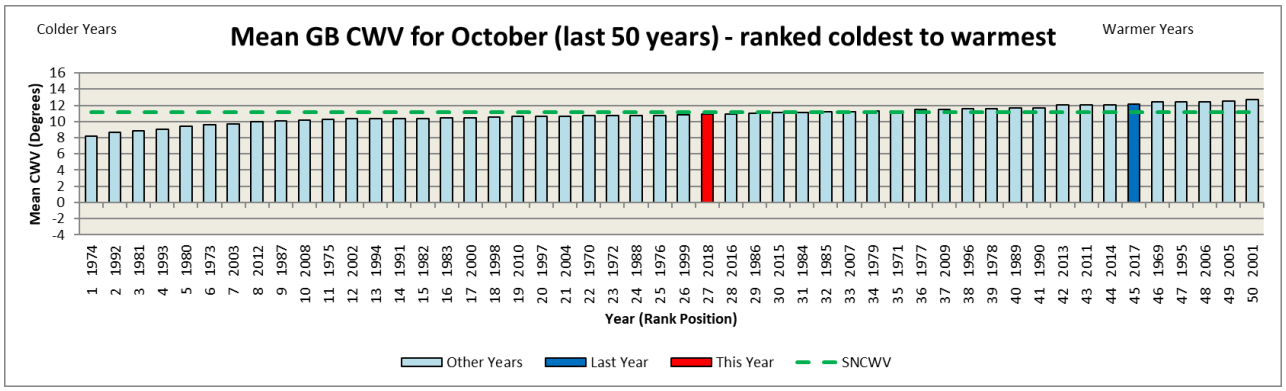


Figure S12.1.2 – 50 Year GB CWV Ranking - November

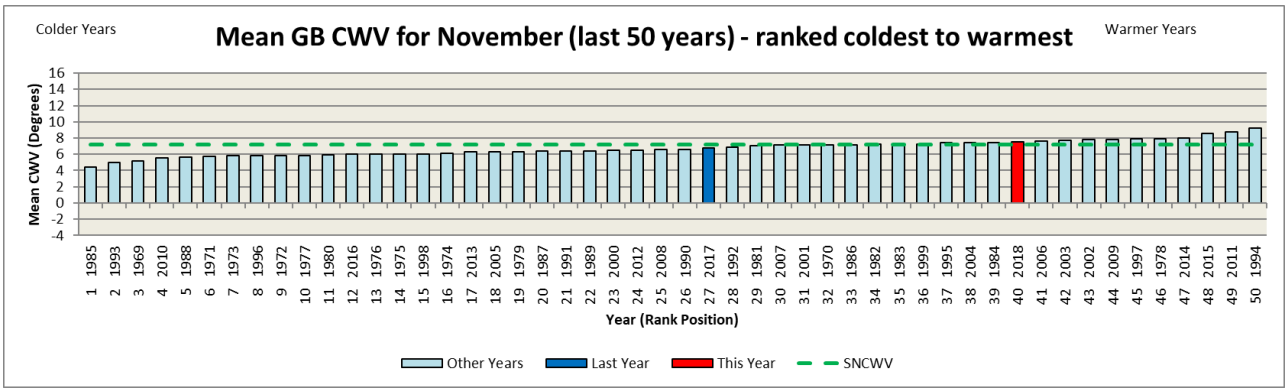


Figure S12.1.3 – 50 Year GB CWV Ranking - December

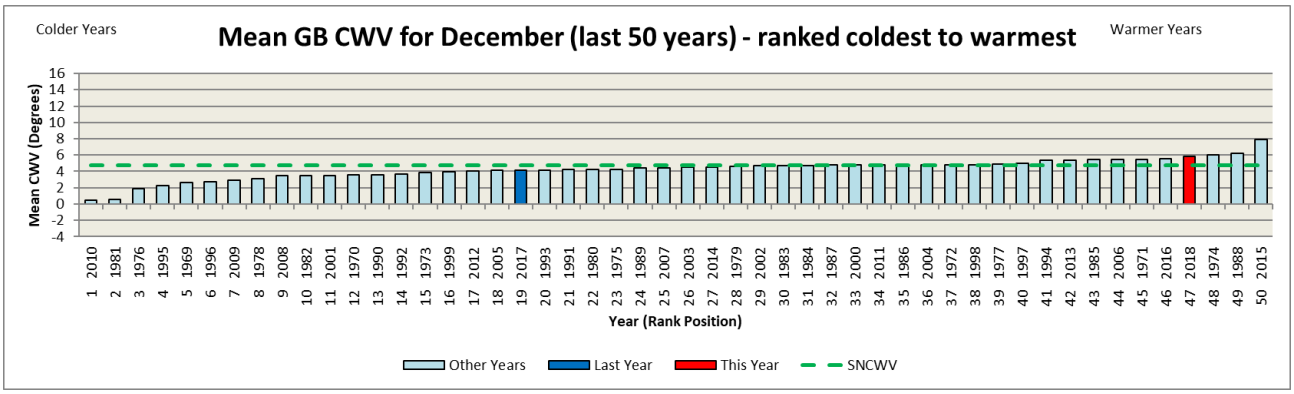


Figure S12.1.4 – 50 Year GB CWV Ranking - January

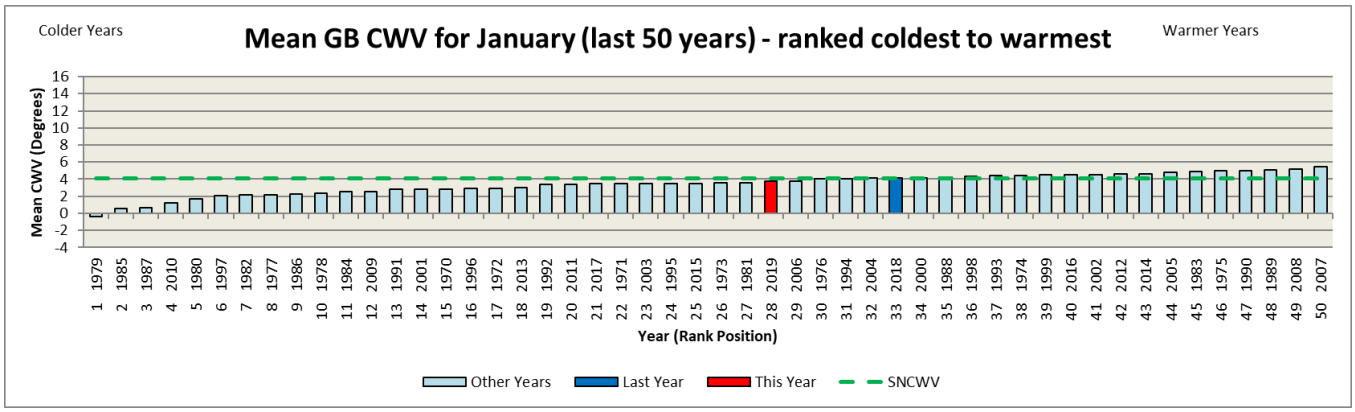


Figure S12.1.5 – 50 Year GB CWV Ranking - February

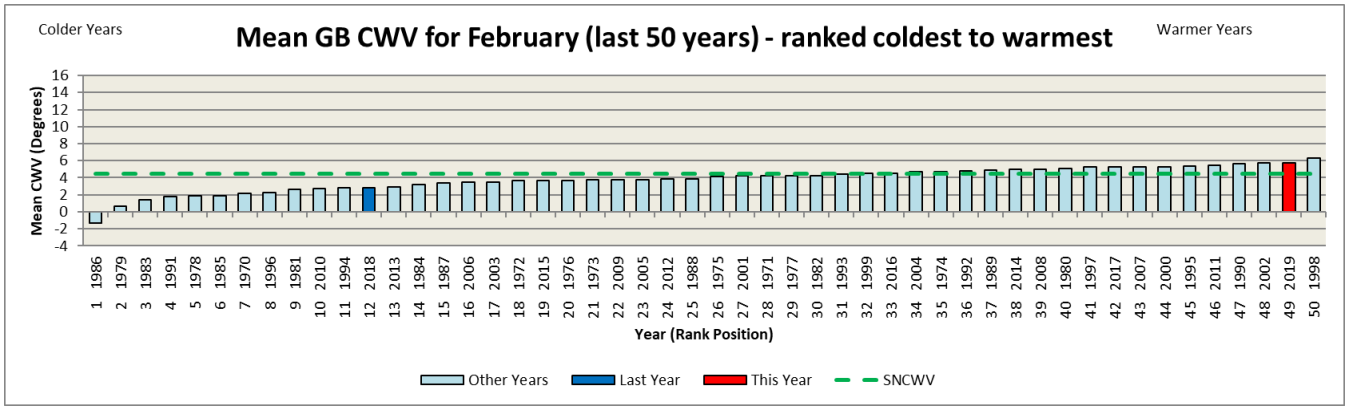


Figure S12.1.6 – 50 Year GB CWV Ranking - March

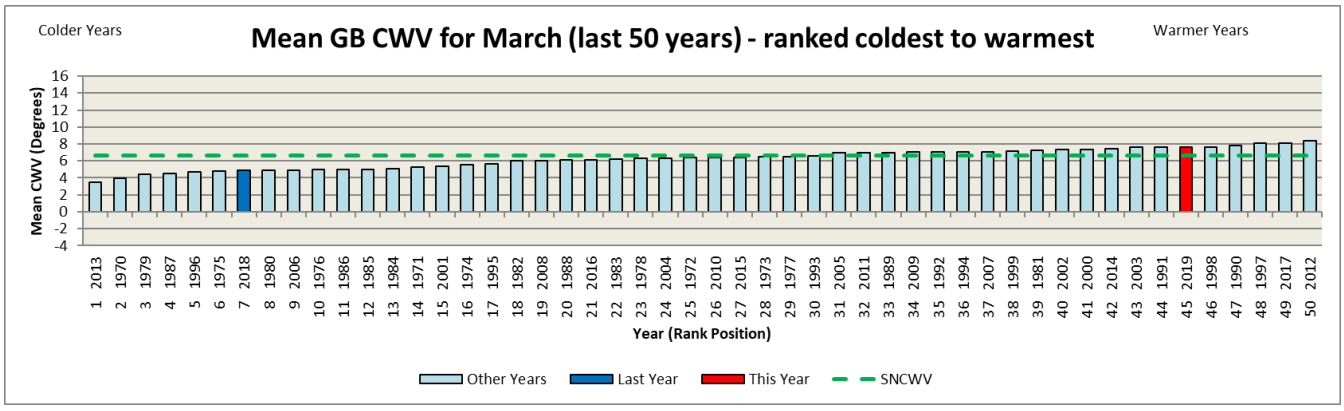


Figure S12.1.7 – 50 Year GB CWV Ranking - April

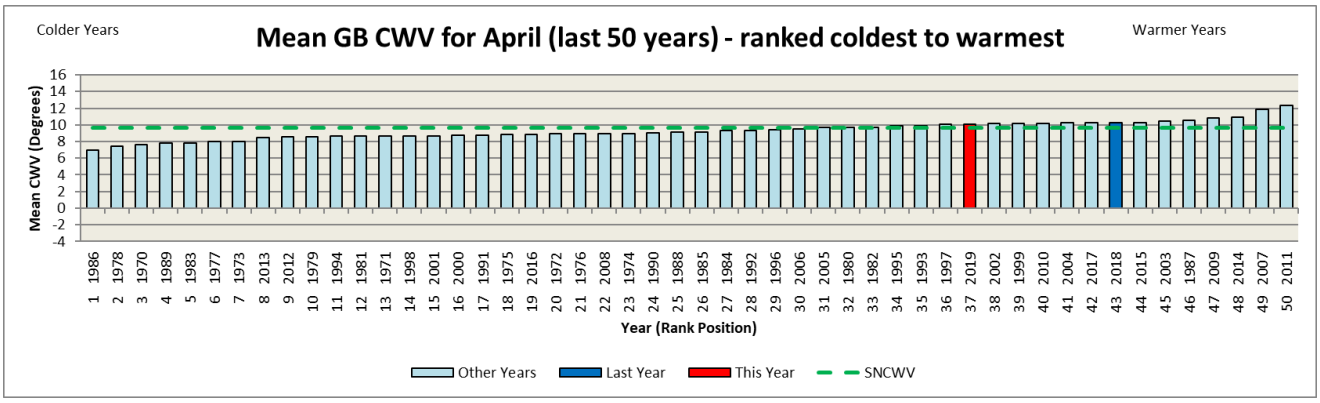


Figure S12.1.8 – 50 Year GB CWV Ranking - May

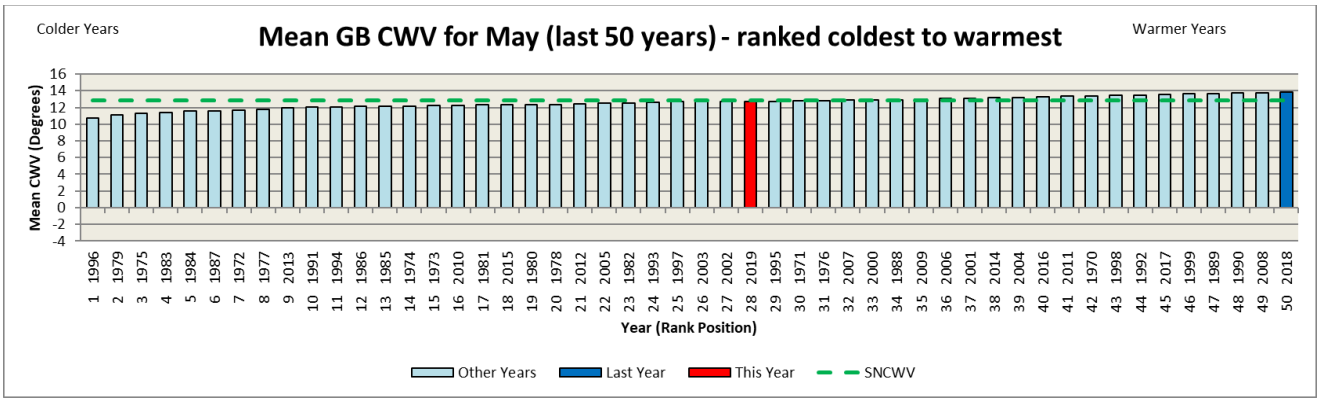


Figure S12.1.9 – 50 Year GB CWV Ranking - June

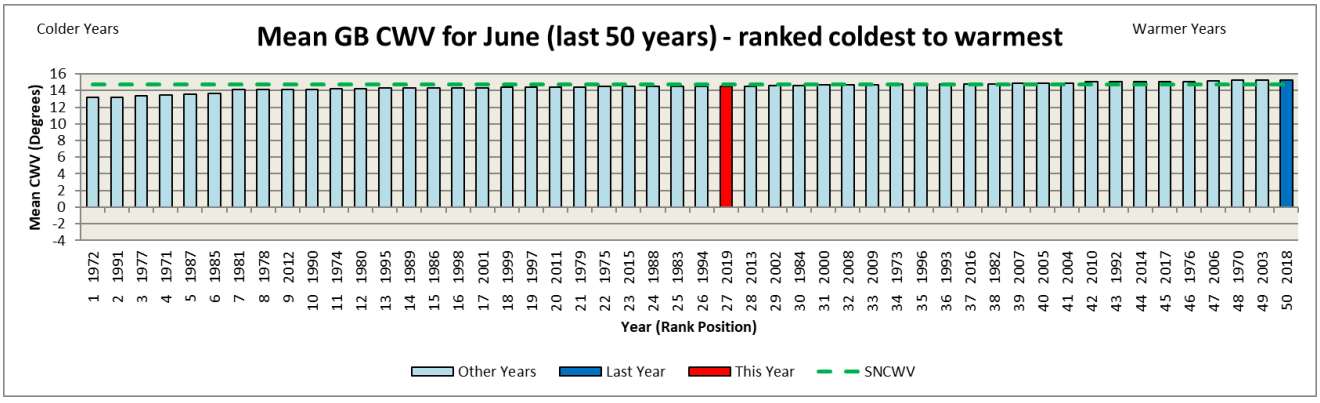


Figure S12.1.10 – 50 Year GB CWV Ranking - July

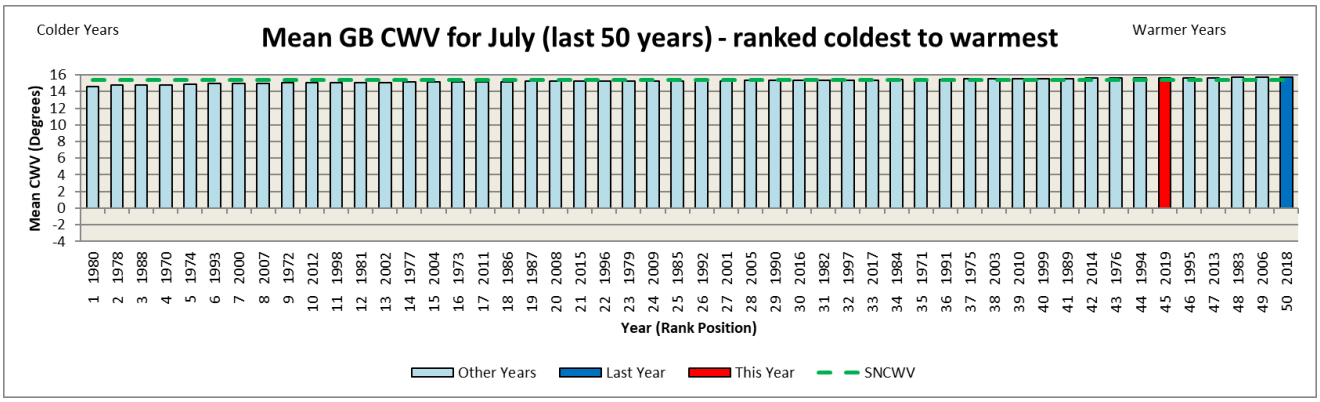


Figure S12.1.11 – 50 Year GB CWV Ranking - August

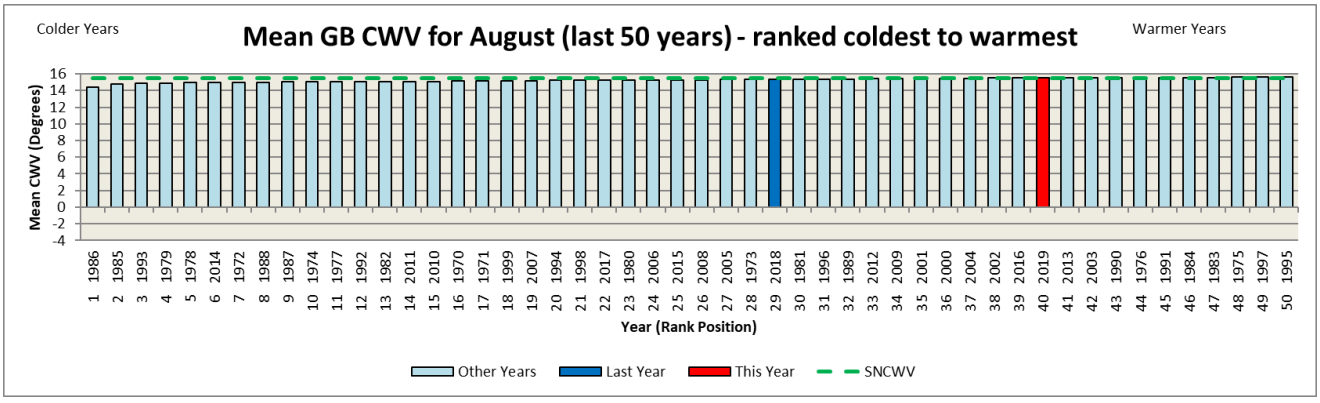


Figure S12.1.12 – 50 Year GB CWV Ranking - September

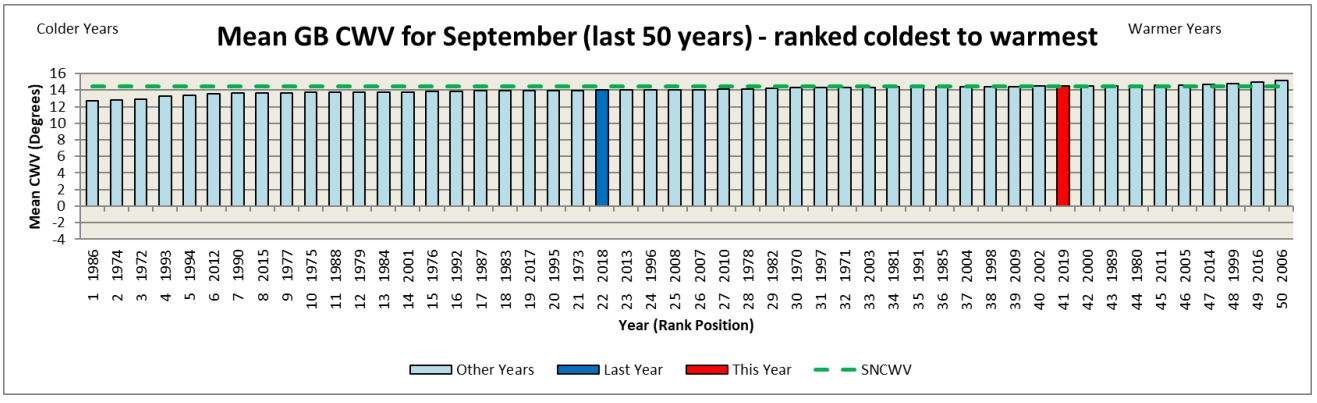


Figure S12.1.13 – Daily Comparisons of CWV vs SNCWV (GB) - October

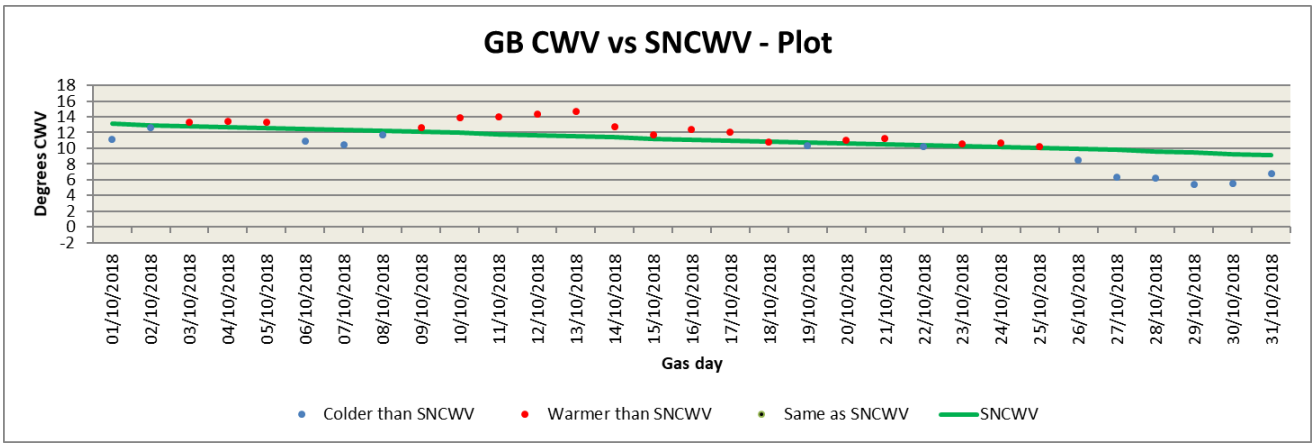


Figure S12.1.14 – Daily Comparisons of CWV vs SNCWV (GB) - November

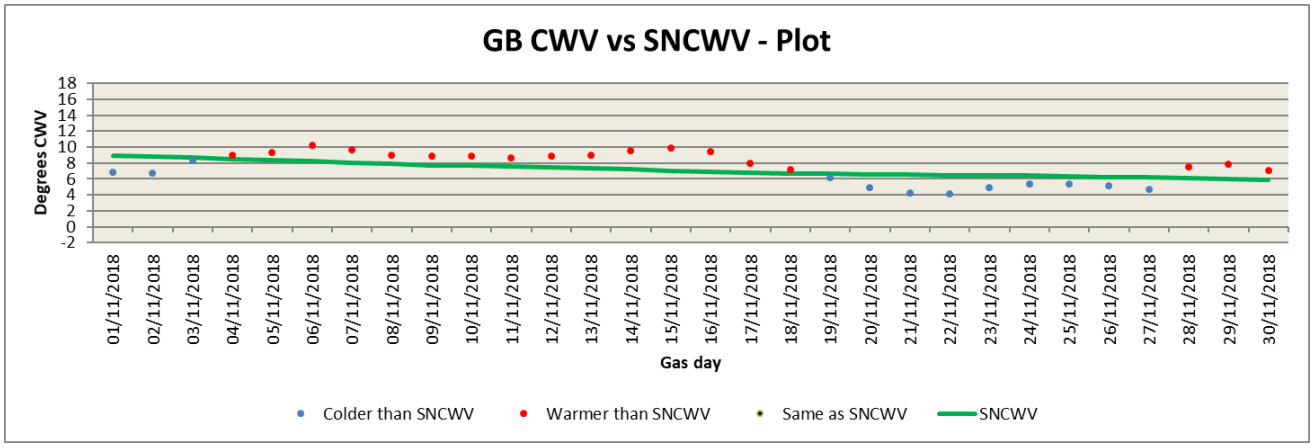


Figure S12.1.15 – Daily Comparisons of CWV vs SNCWV (GB) - December

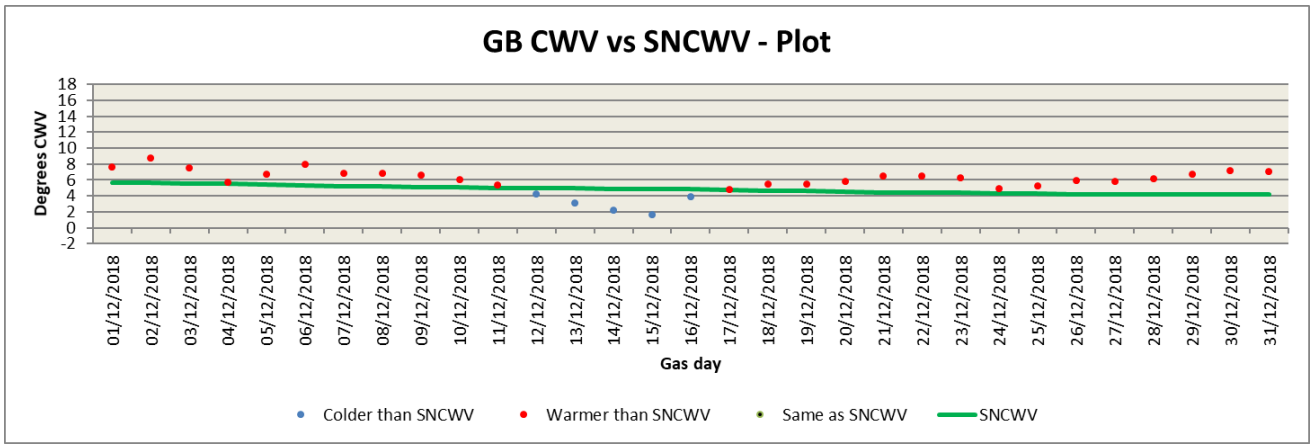


Figure S12.1.16 – Daily Comparisons of CWV vs SNCWV (GB) - January

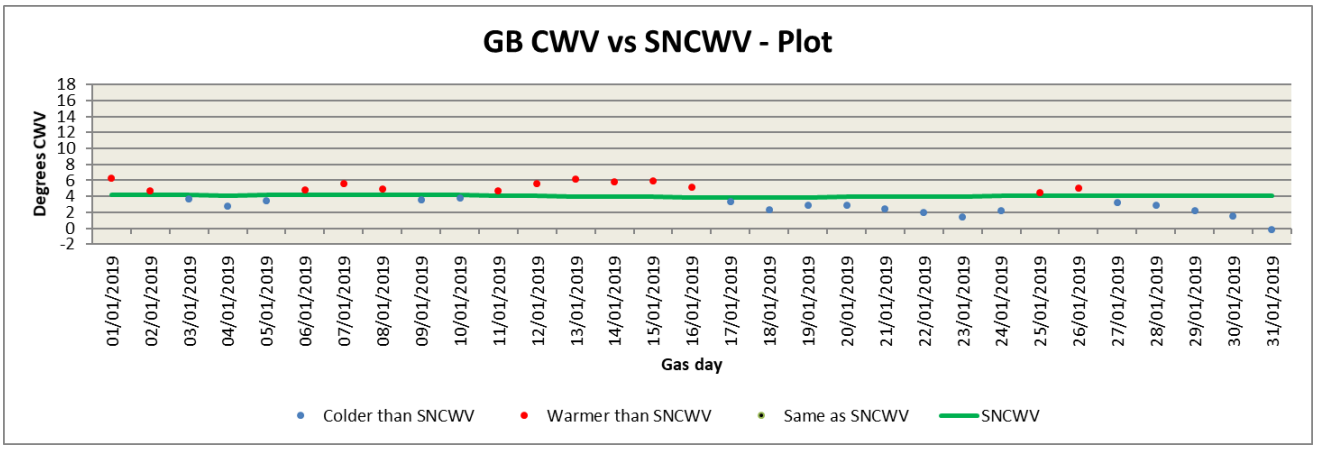


Figure S12.1.17 – Daily Comparisons of CWV vs SNCWV (GB) - February

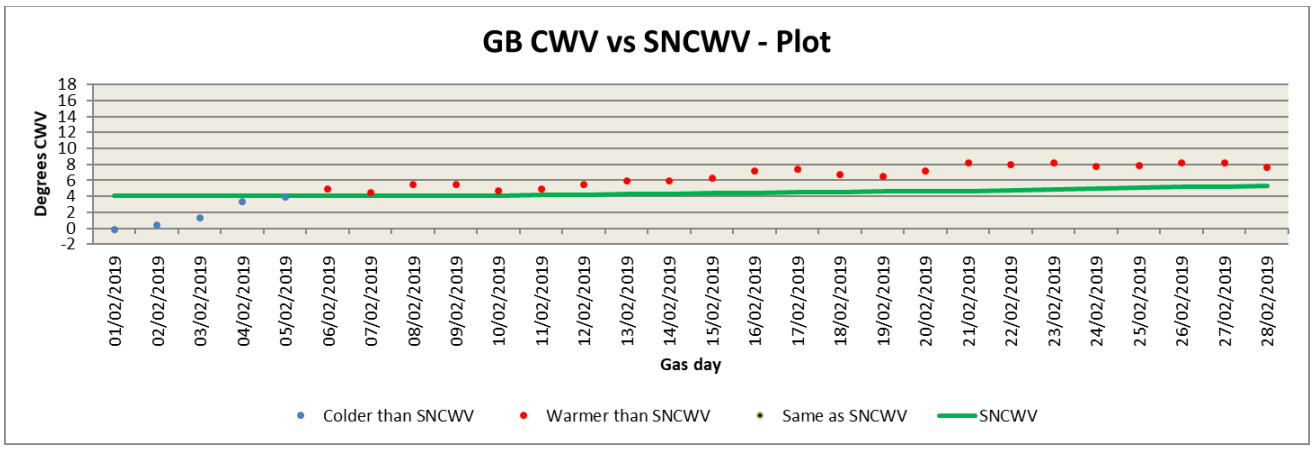


Figure S12.1.18 – Daily Comparisons of CWV vs SNCWV (GB) - March

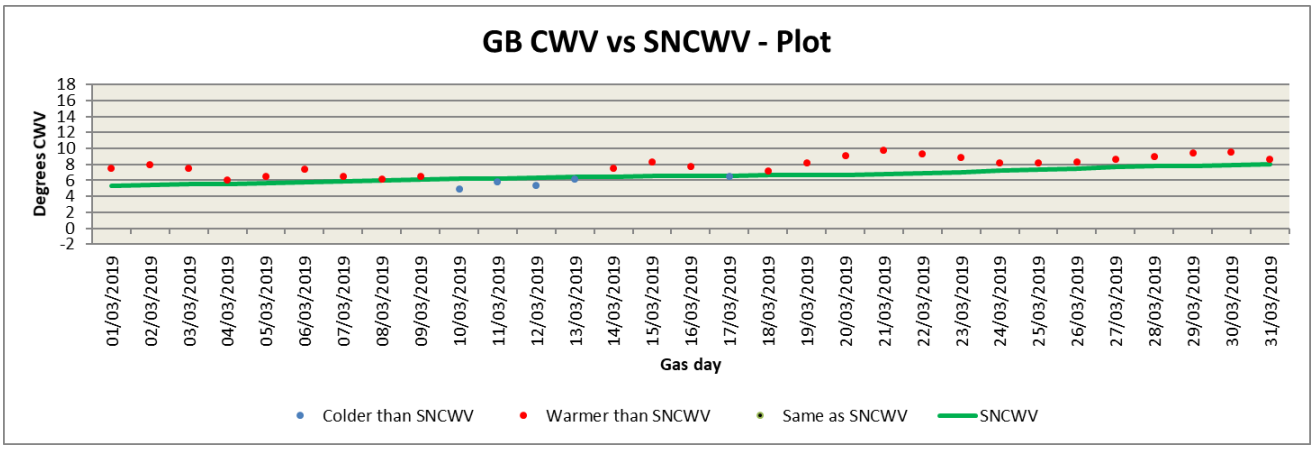


Figure S12.1.19 – Daily Comparisons of CWV vs SNCWV (GB) - April

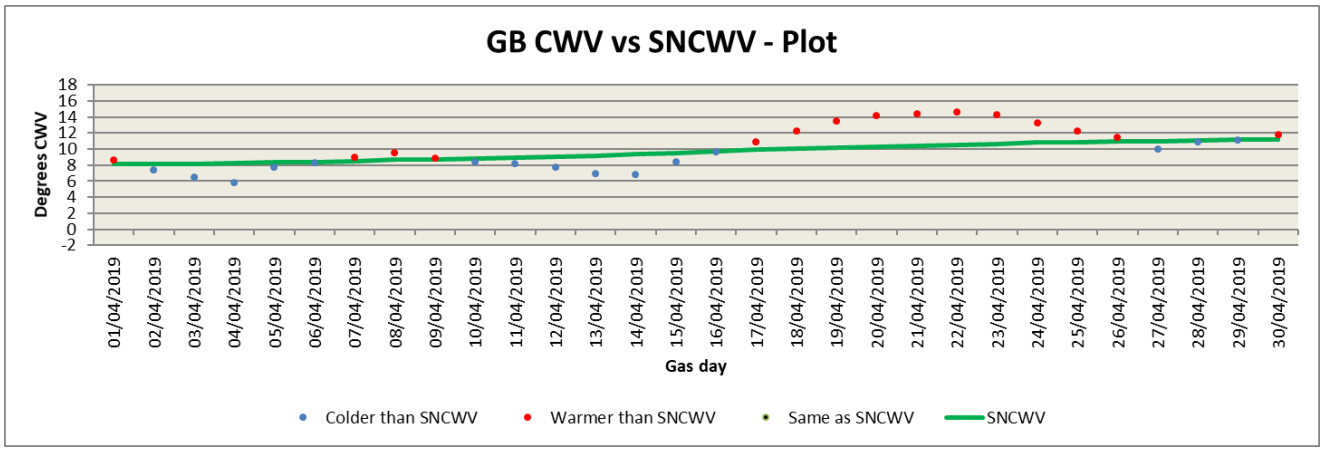


Figure S12.1.20 – Daily Comparisons of CWV vs SNCWV (GB) - May

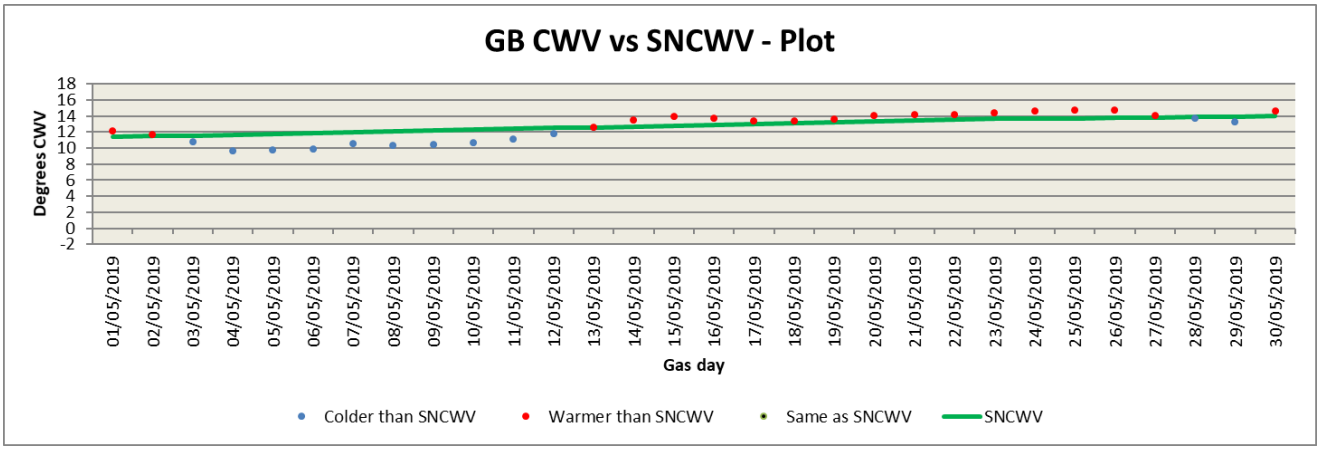


Figure S12.1.21 – Daily Comparisons of CWV vs SNCWV (GB) - June

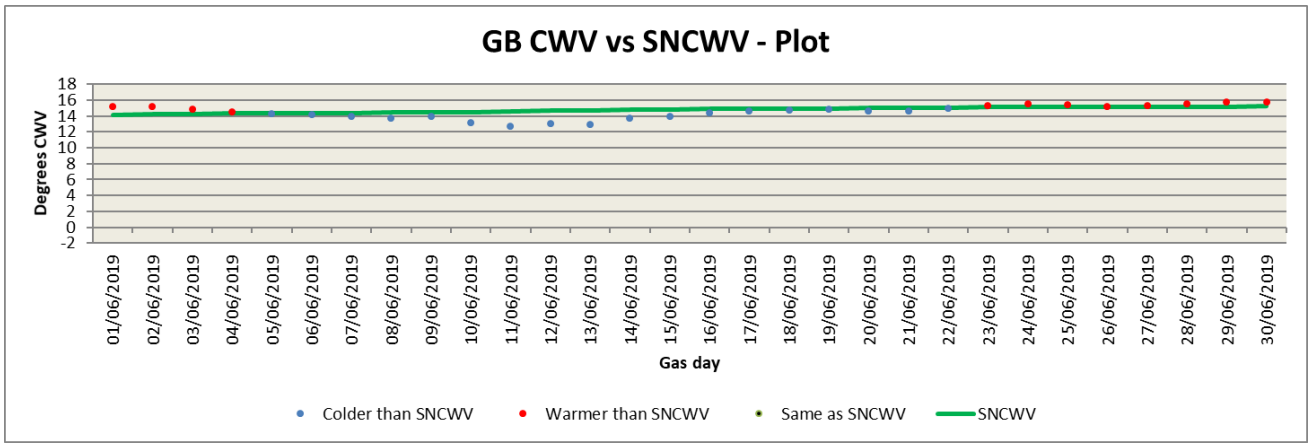


Figure S12.1.22 – Daily Comparisons of CWV vs SNCWV (GB) - July

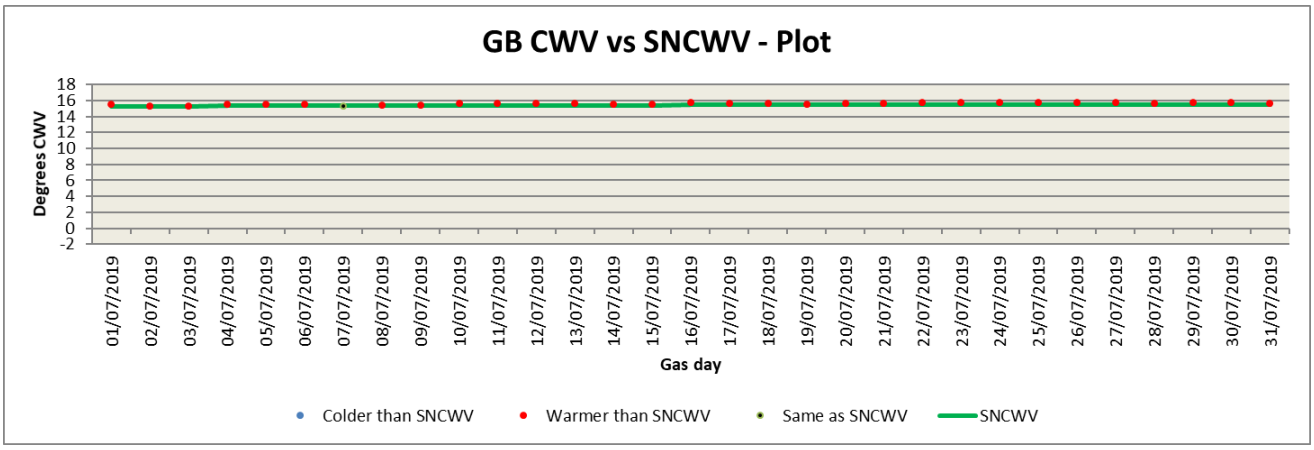


Figure S12.1.23 – Daily Comparisons of CWV vs SNCWV (GB) - August

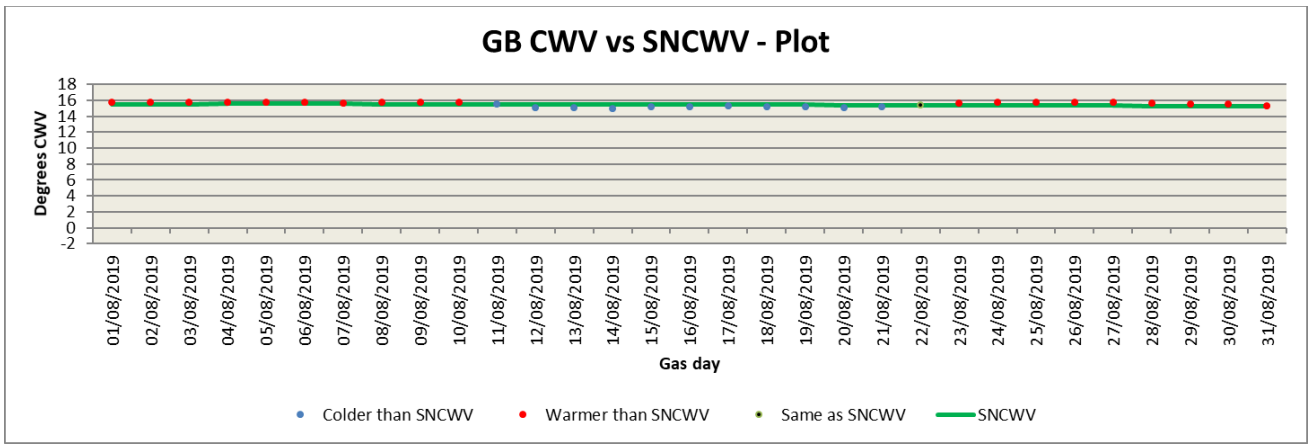


Figure S12.1.24 – Daily Comparisons of CWV vs SNCWV (GB) - September

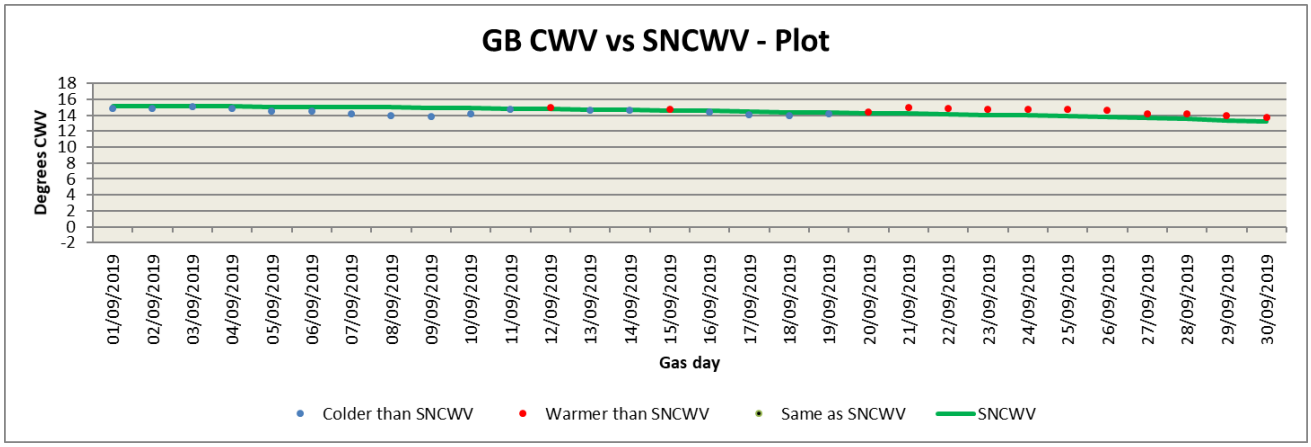


Figure S12.1.25 – Daily Comparisons of CWV vs SNCWV (LDZ SC) - Full Year

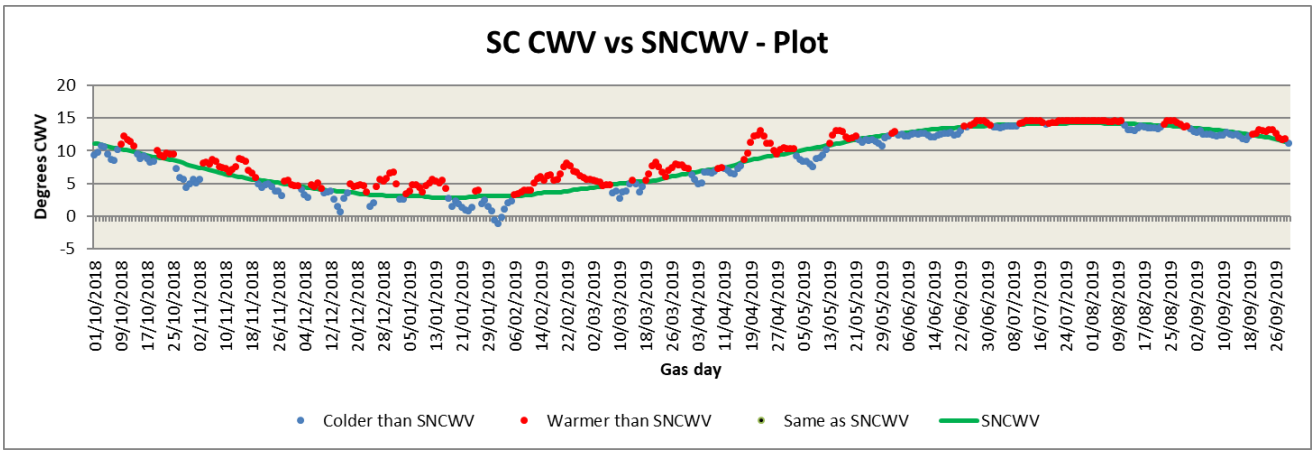


Figure S12.1.26 – Daily Comparisons of CWV vs SNCWV (LDZ NO) - Full Year

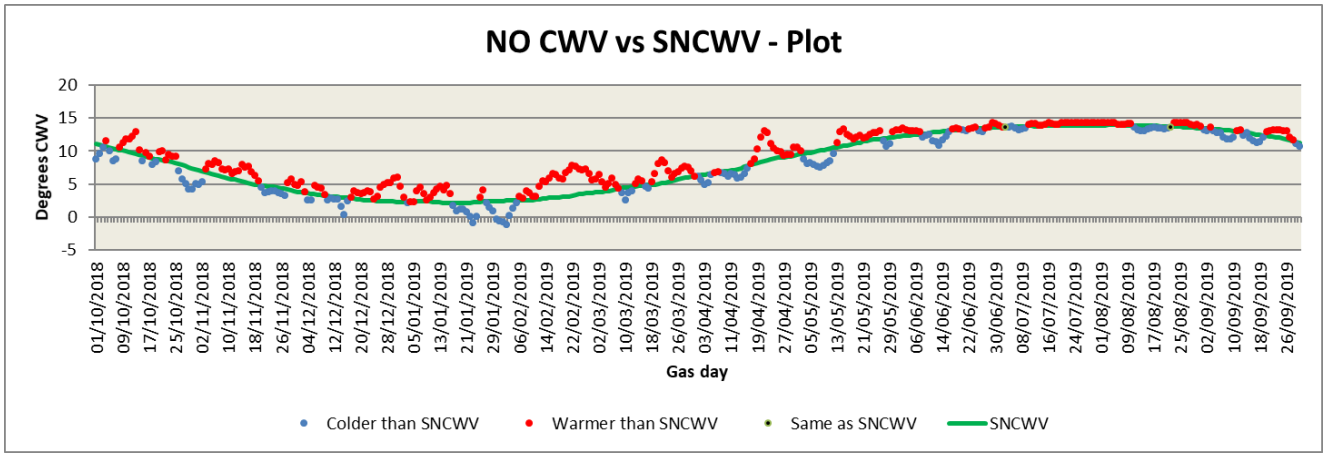


Figure S12.1.27 – Daily Comparisons of CWV vs SNCWV (LDZ NW) - Full Year

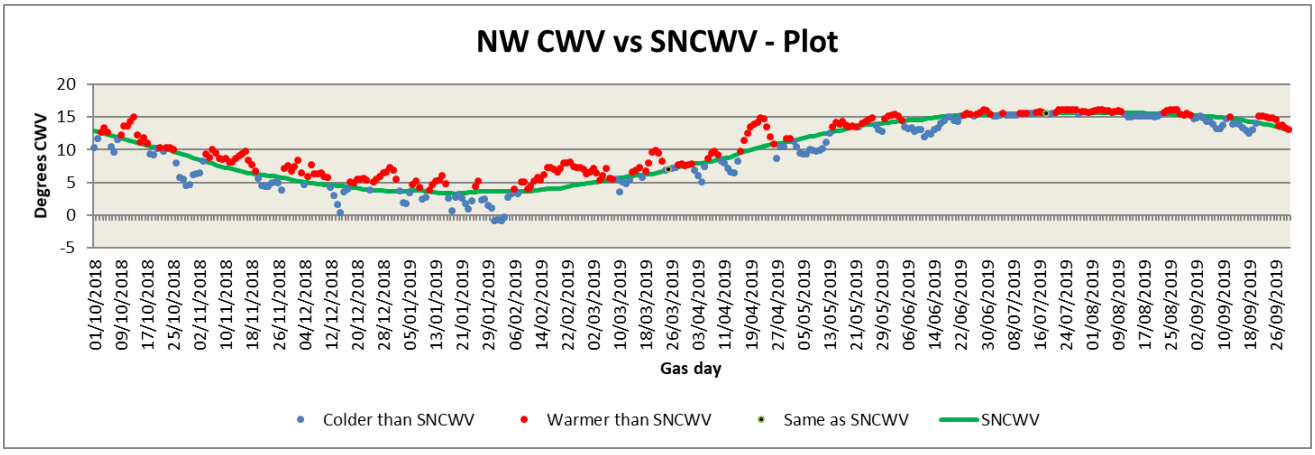


Figure S12.1.28 – Daily Comparisons of CWV vs SNCWV (LDZ NE) - Full Year

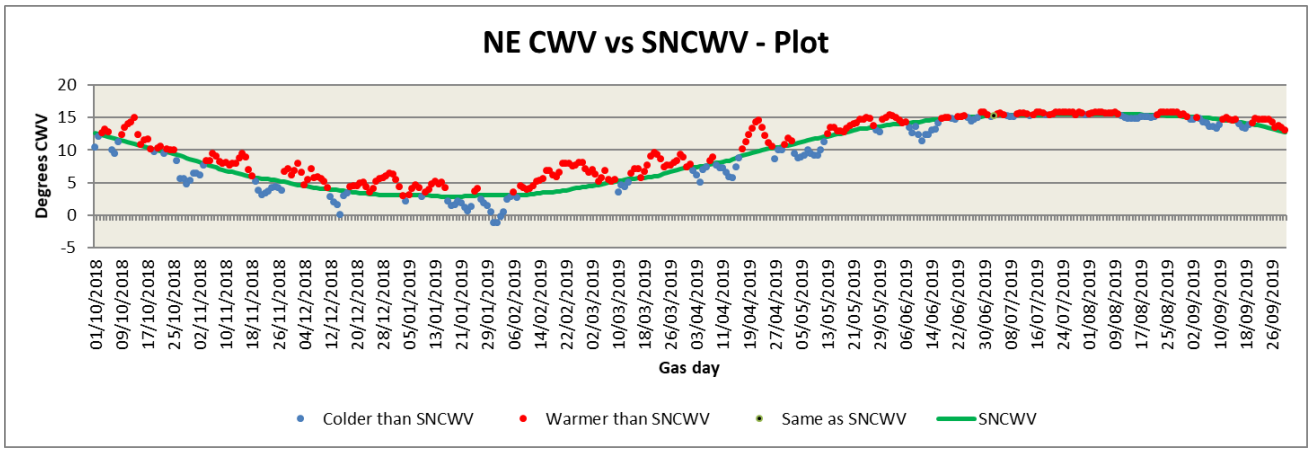


Figure S12.1.29 – Daily Comparisons of CWV vs SNCWV (LDZ EM) - Full Year

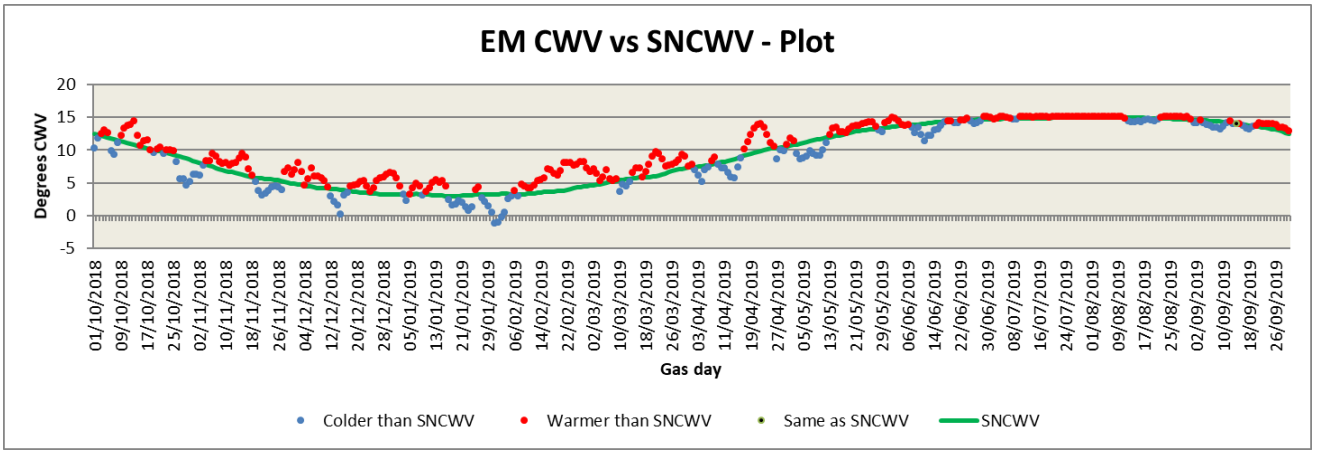


Figure S12.1.30 – Daily Comparisons of CWV vs SNCWV (LDZ WM) - Full Year

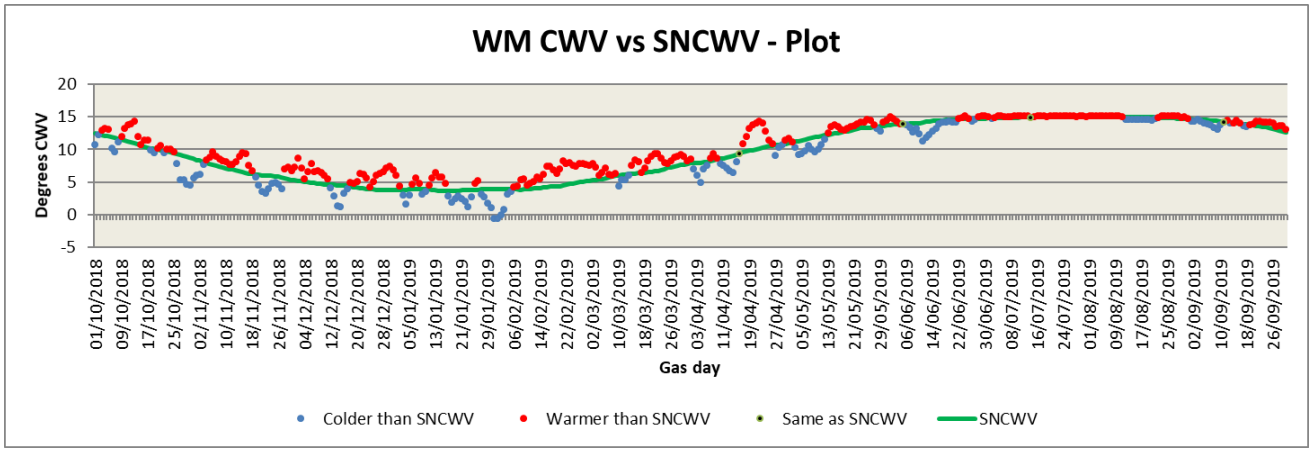


Figure S12.1.31 – Daily Comparisons of CWV vs SNCWV (LDZ WS) - Full Year

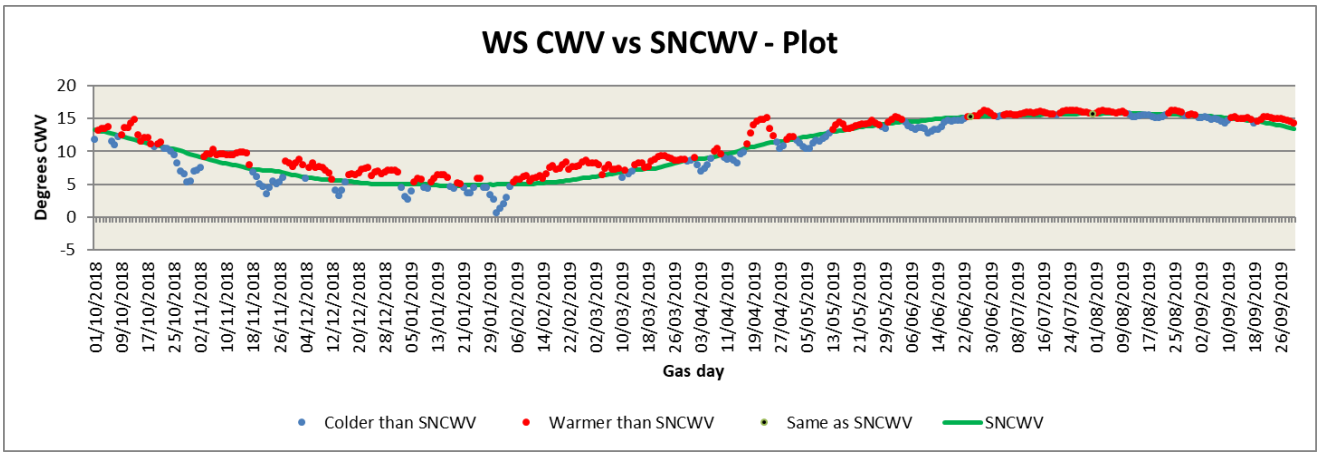


Figure S12.1.32 – Daily Comparisons of CWV vs SNCWV (LDZ EA) - Full Year

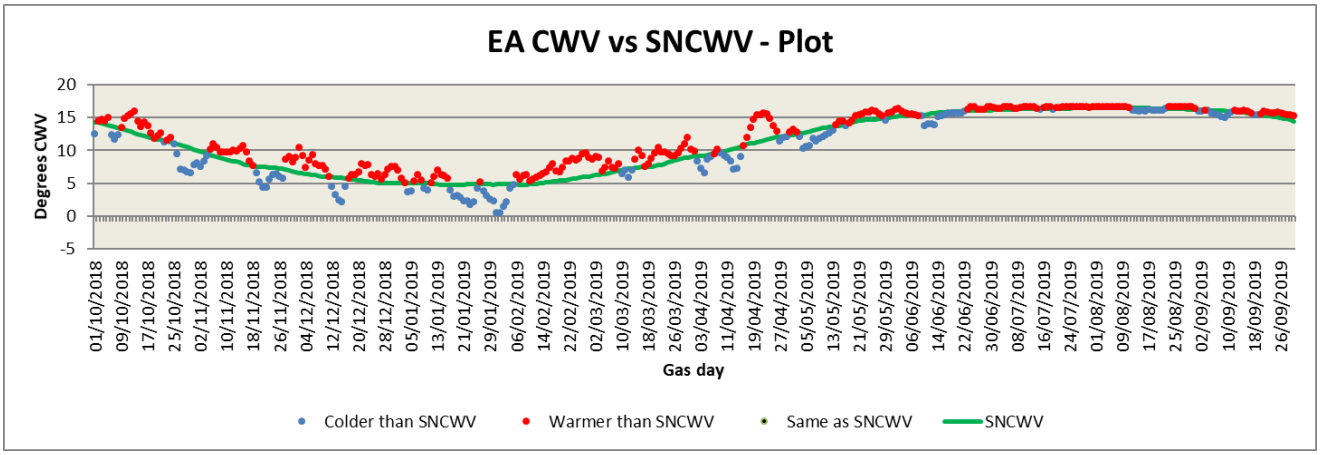


Figure S12.1.33 – Daily Comparisons of CWV vs SNCWV (LDZ NT) - Full Year

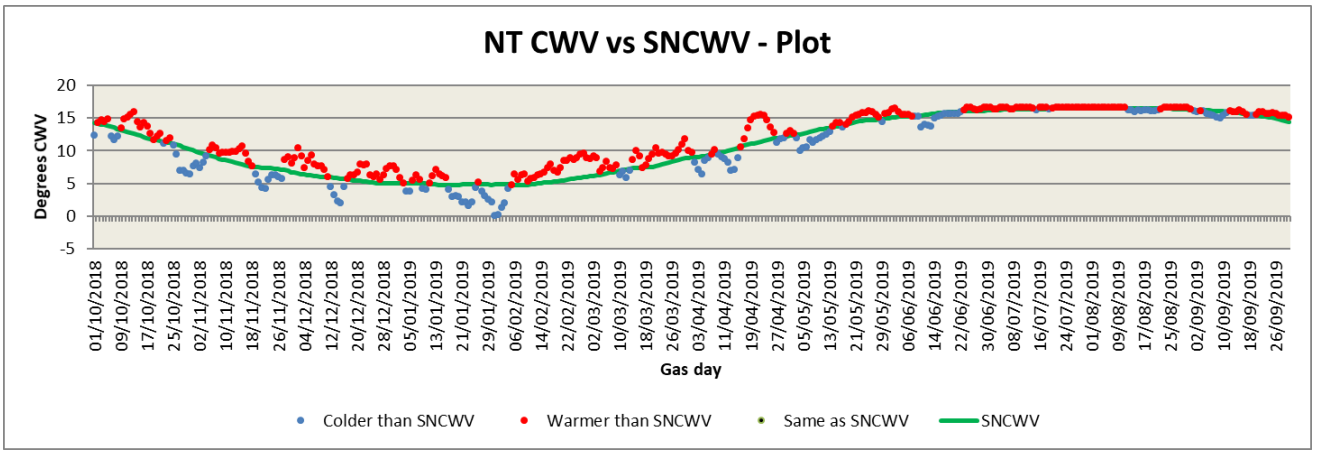


Figure S12.1.34 – Daily Comparisons of CWV vs SNCWV (LDZ SE) - Full Year

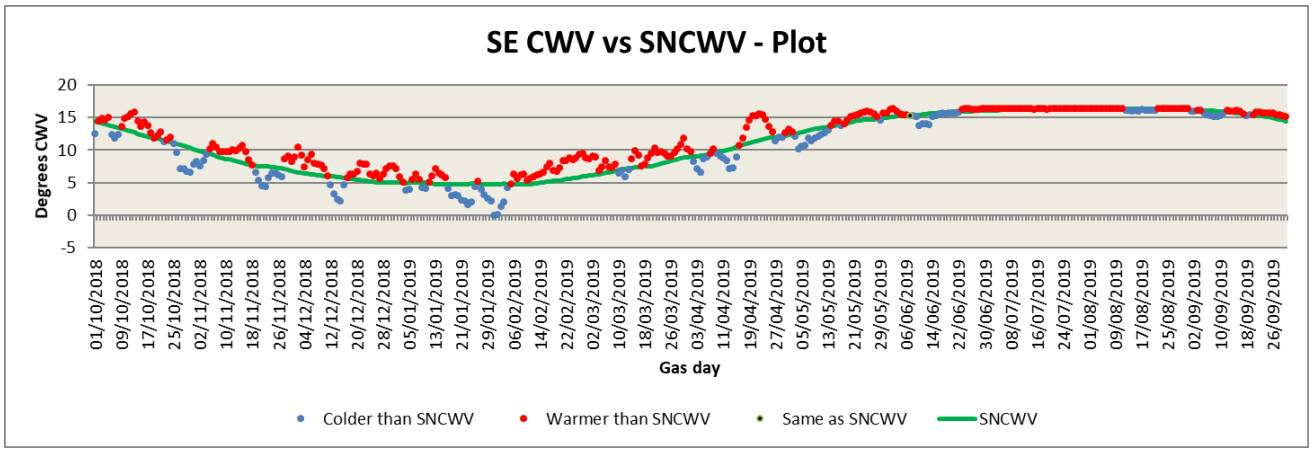


Figure S12.1.35 – Daily Comparisons of CWV vs SNCWV (LDZ SO) - Full Year

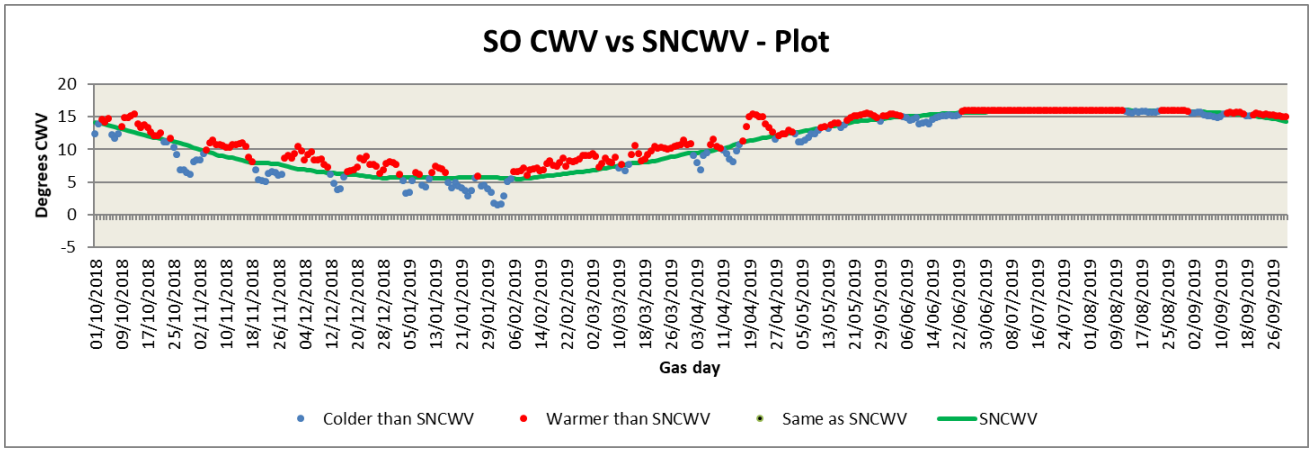


Figure S12.1.36 – Daily Comparisons of CWV vs SNCWV (LDZ SW) - Full Year

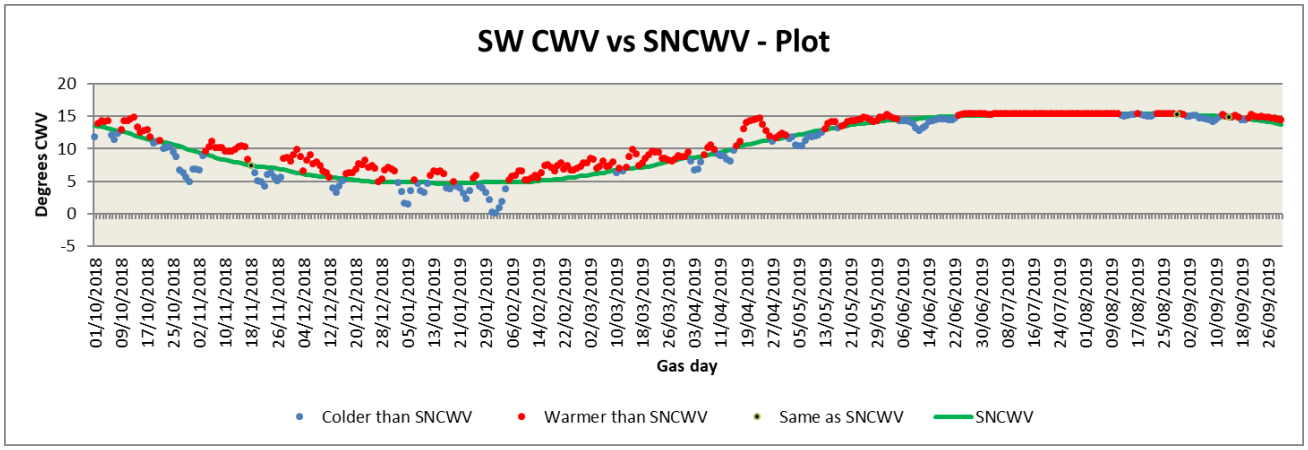


Figure S12.1.37 – WCF vs Confidence Intervals (LDZ SC) - Full Year

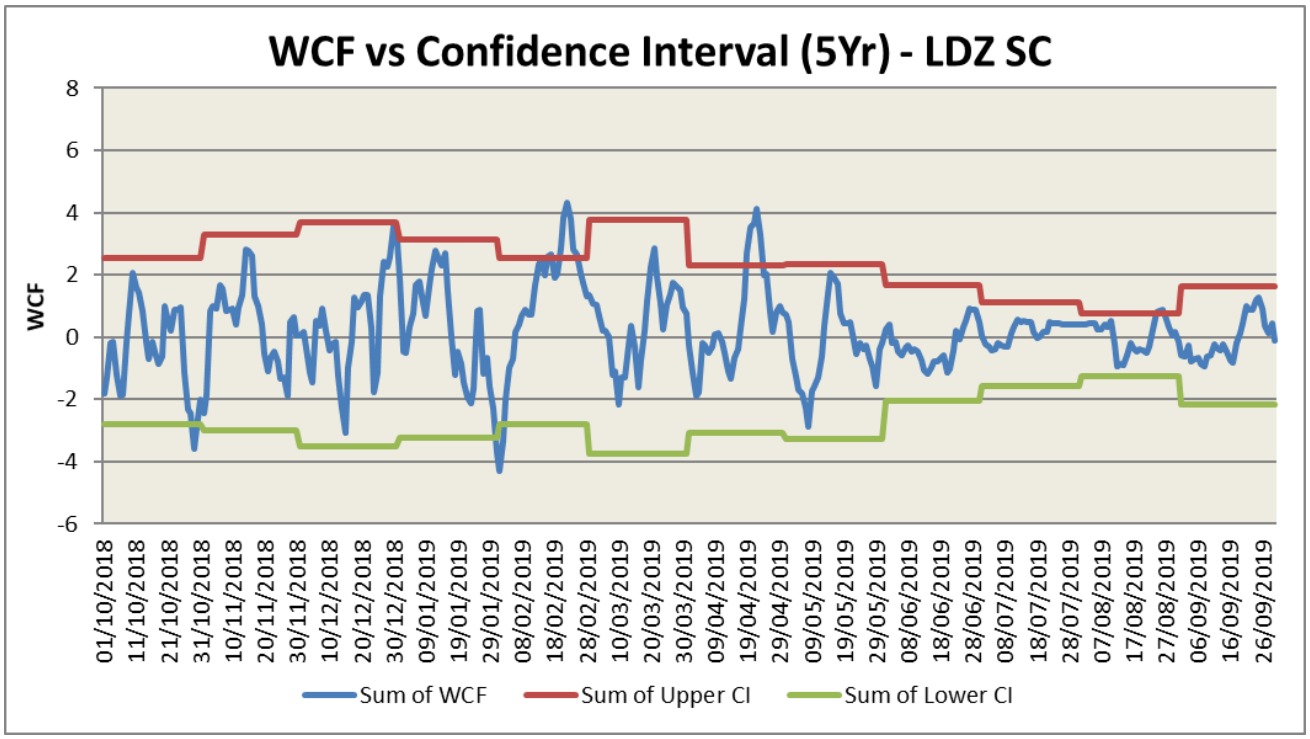


Figure S12.1.38 – WCF vs Confidence Intervals (LDZ NO) - Full Year

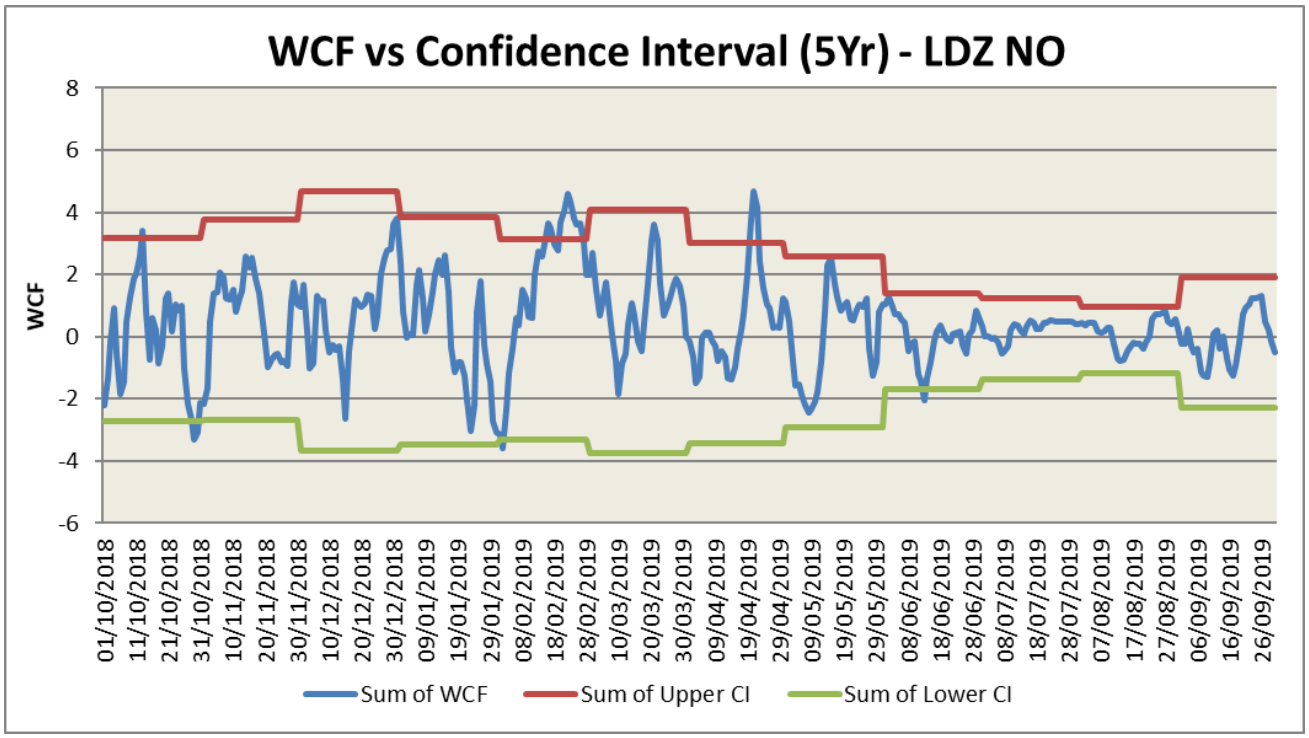


Figure S12.1.39 – WCF vs Confidence Intervals (LDZ NW) - Full Year

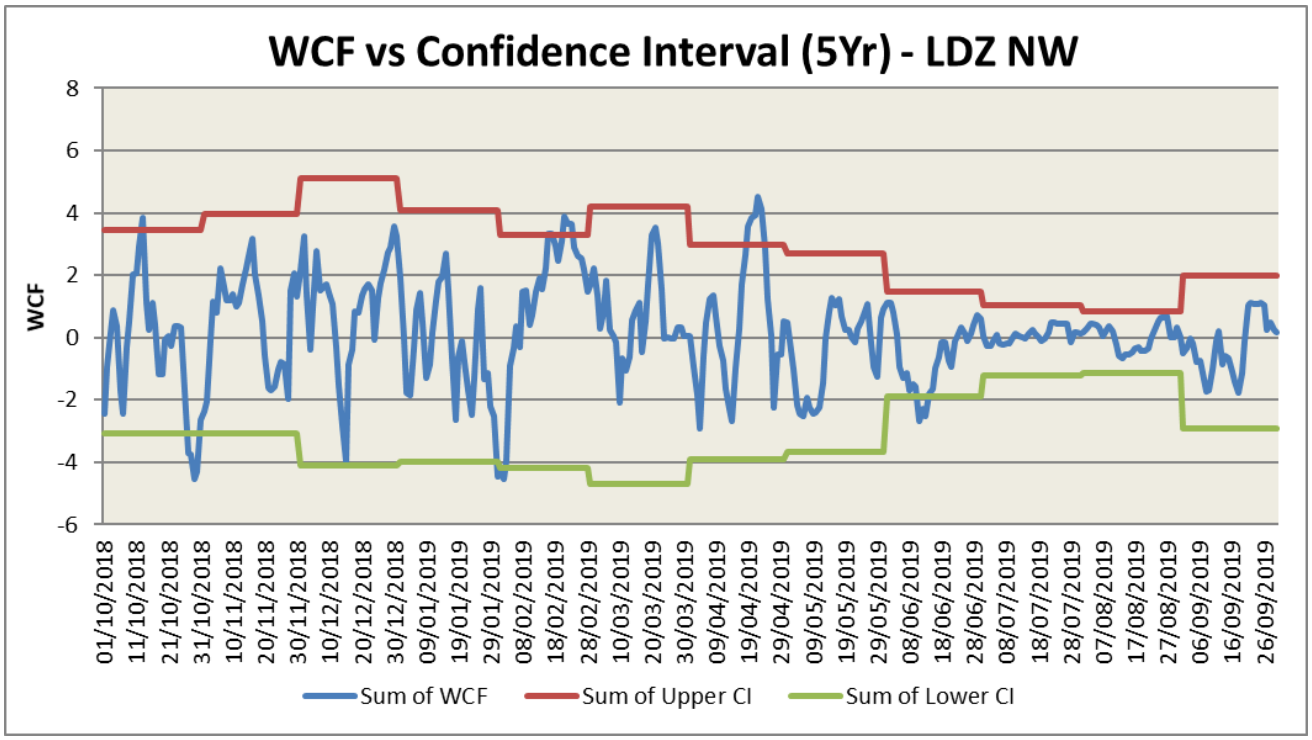


Figure S12.1.40 – WCF vs Confidence Intervals (LDZ NE) - Full Year

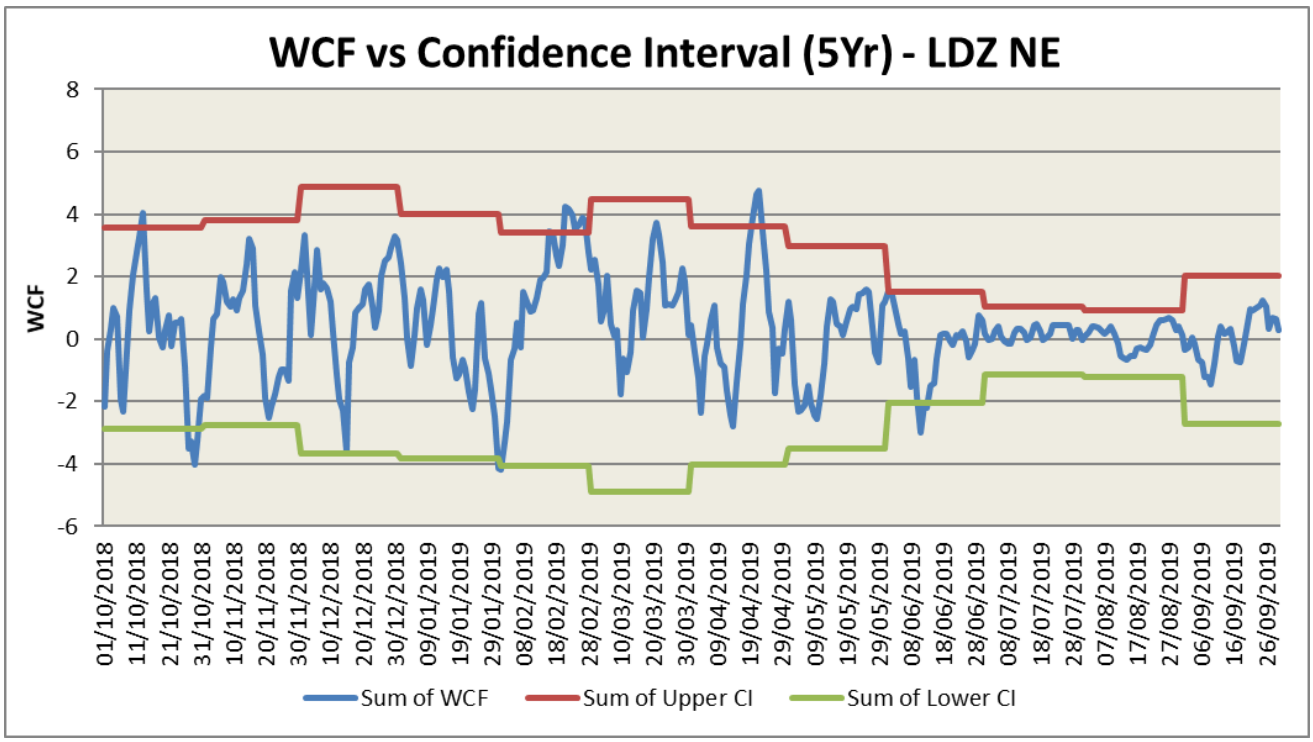


Figure S12.1.41 – WCF vs Confidence Intervals (LDZ EM) - Full Year

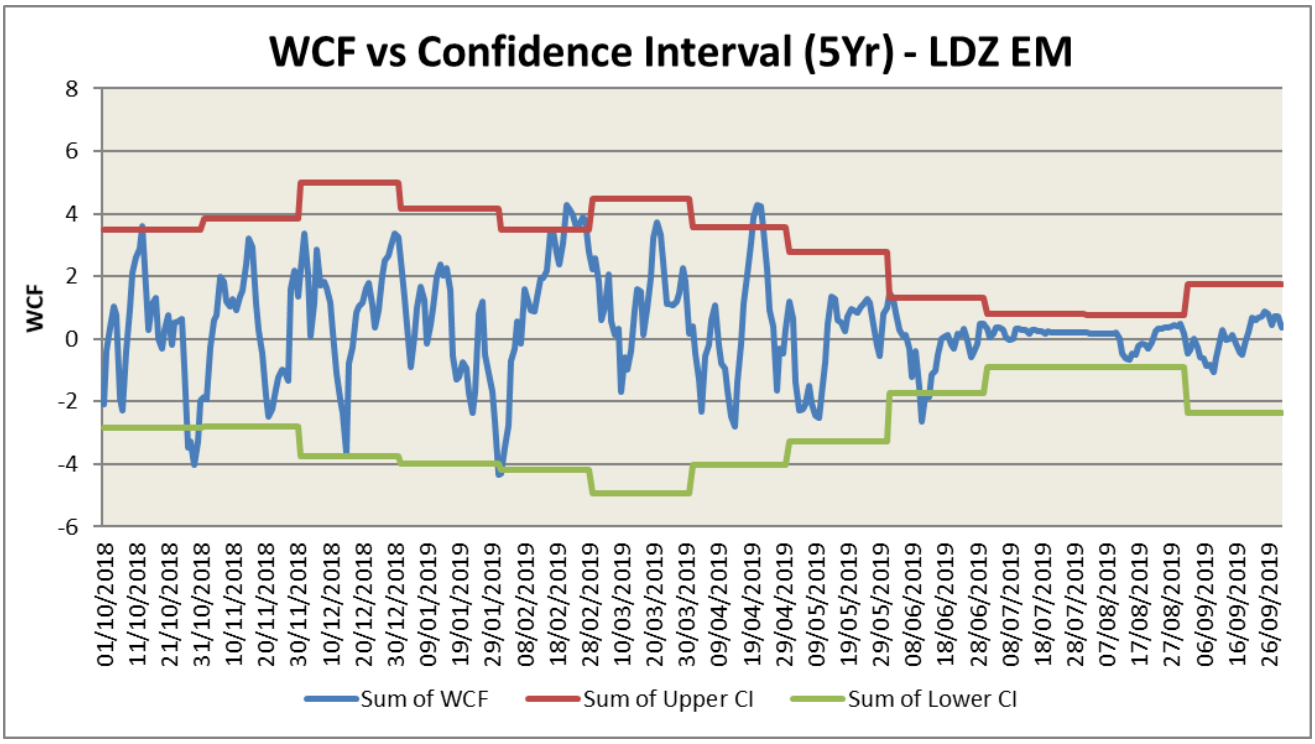


Figure S12.1.42 – WCF vs Confidence Intervals (LDZ WM) - Full Year

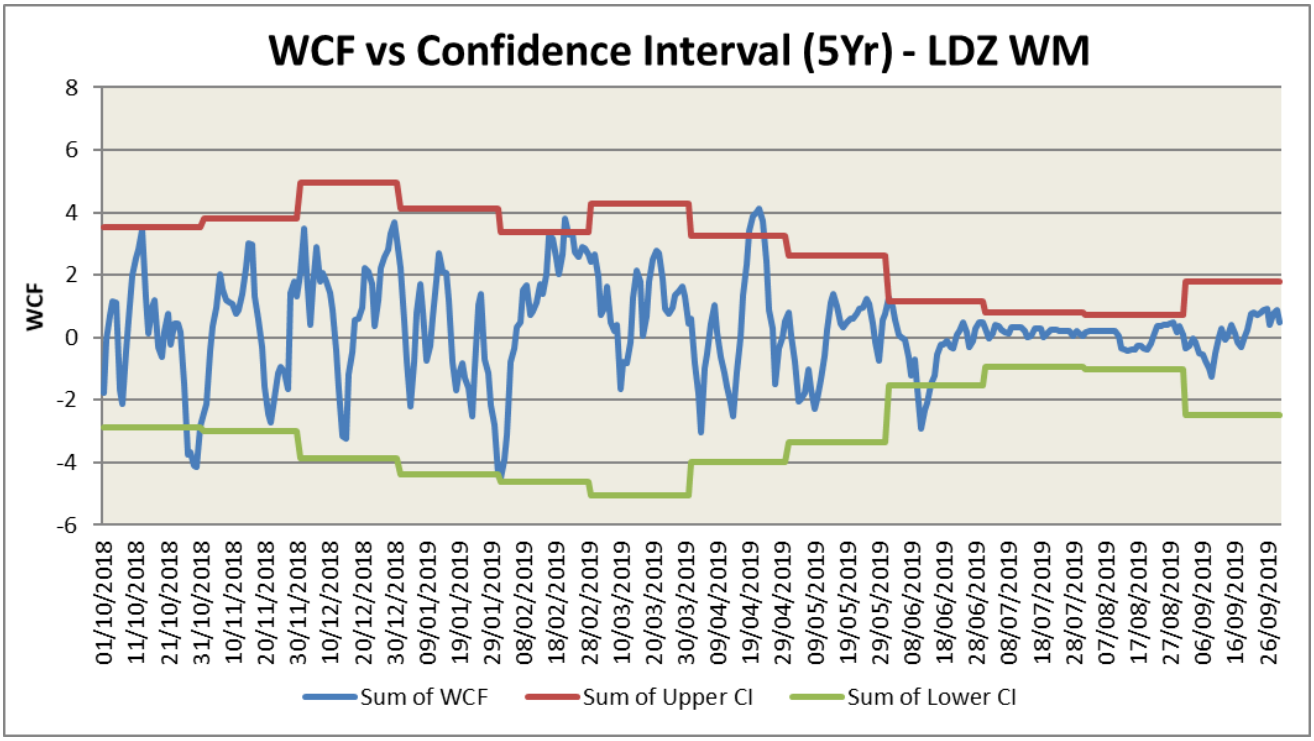


Figure S12.1.43 – WCF vs Confidence Intervals (LDZ WS) - Full Year

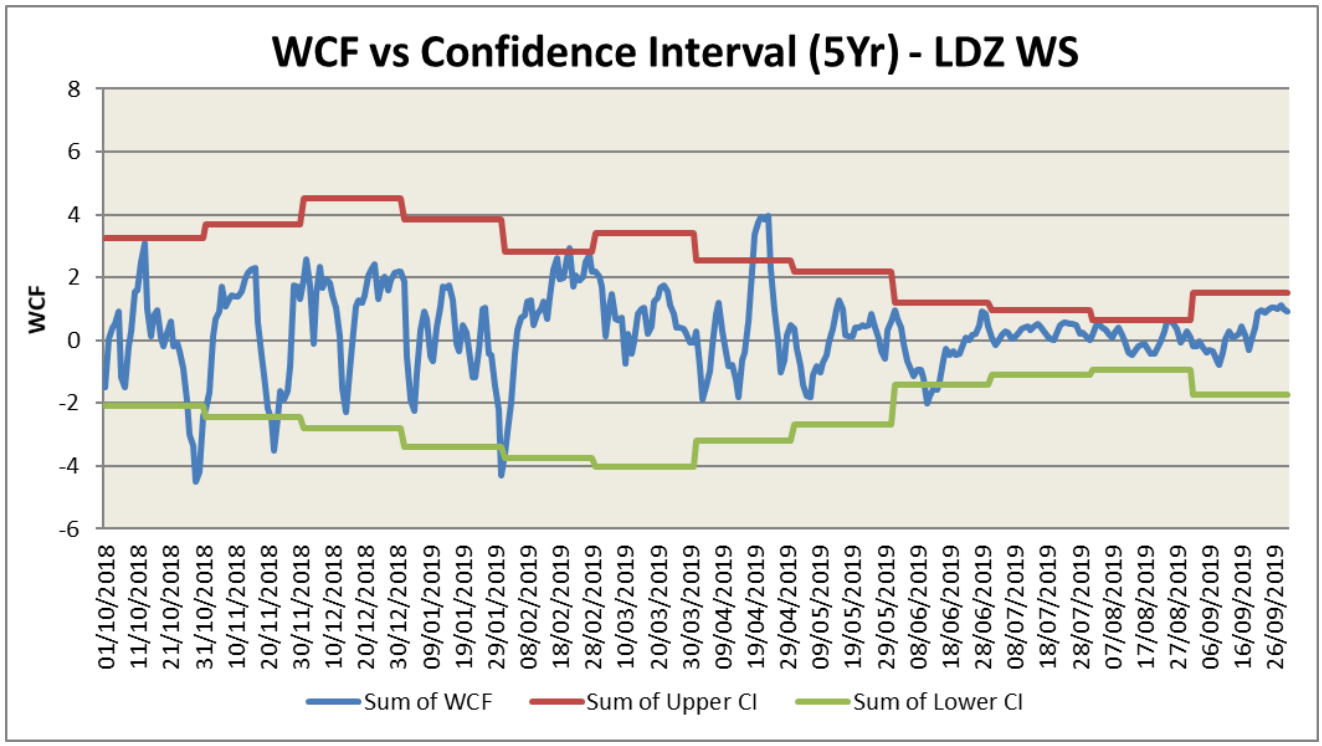


Figure S12.1.44 – WCF vs Confidence Intervals (LDZ EA) - Full Year

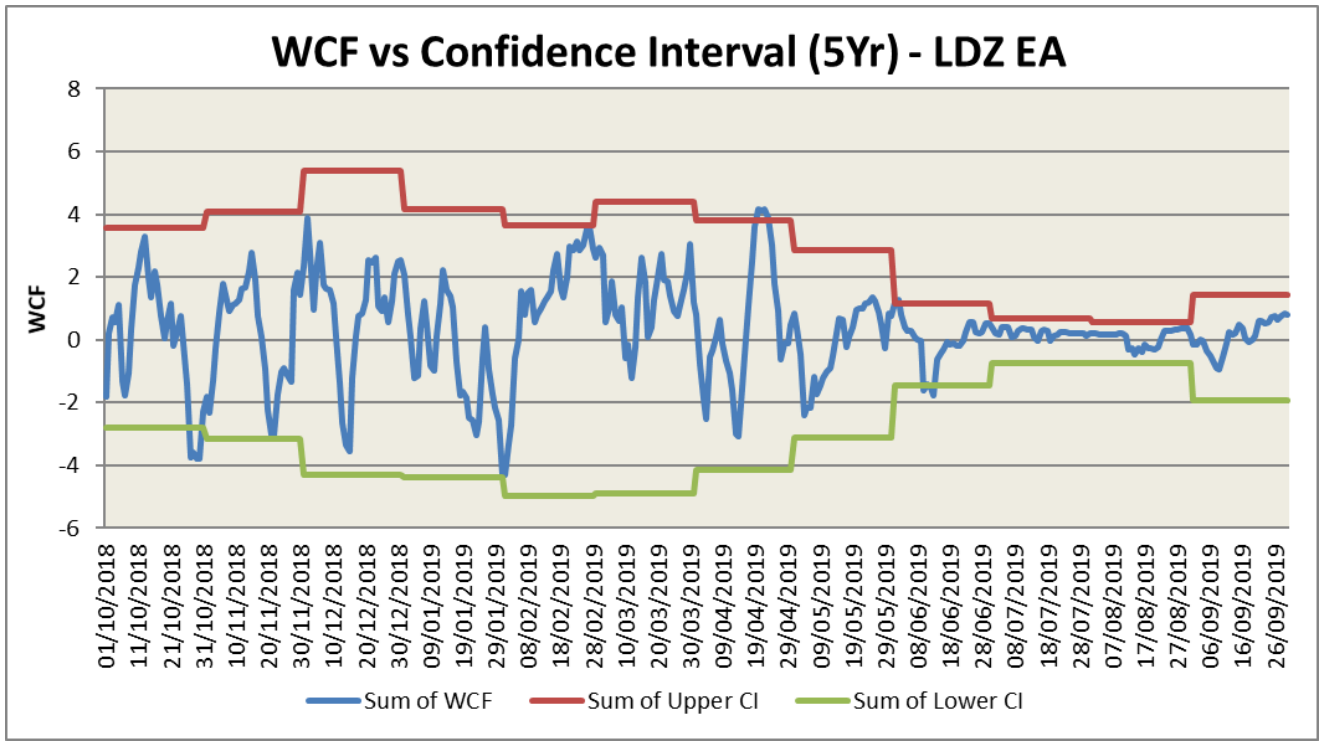


Figure S12.1.45 – WCF vs Confidence Intervals (LDZ NT) - Full Year

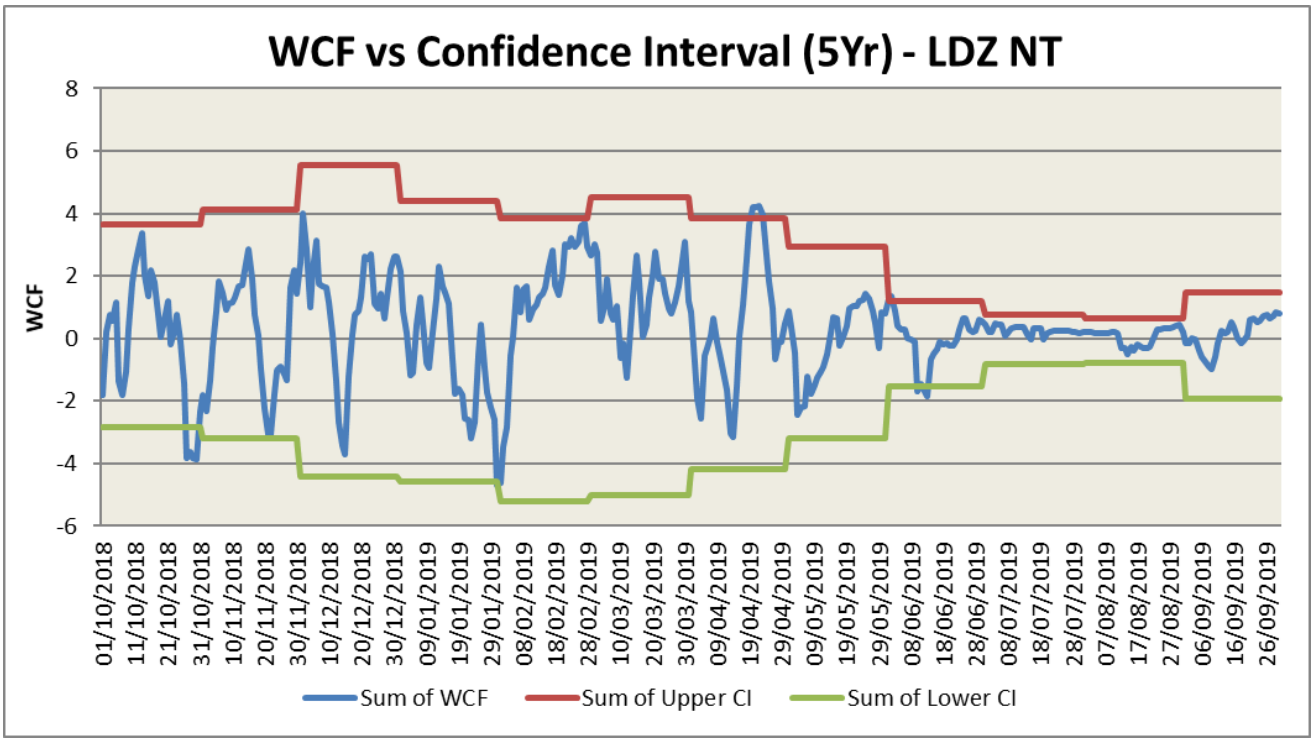


Figure S12.1.46 – WCF vs Confidence Intervals (LDZ SE) - Full Year

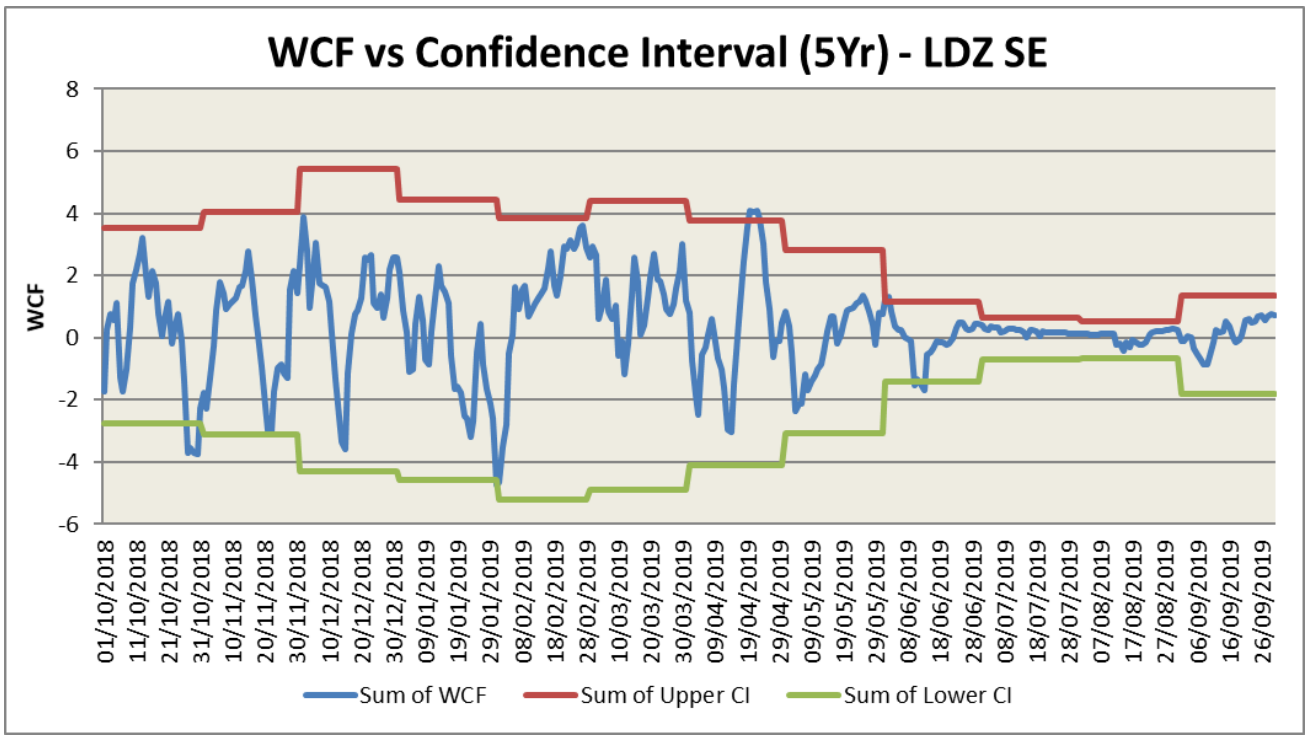


Figure S12.1.47 – WCF vs Confidence Intervals (LDZ SO) - Full Year

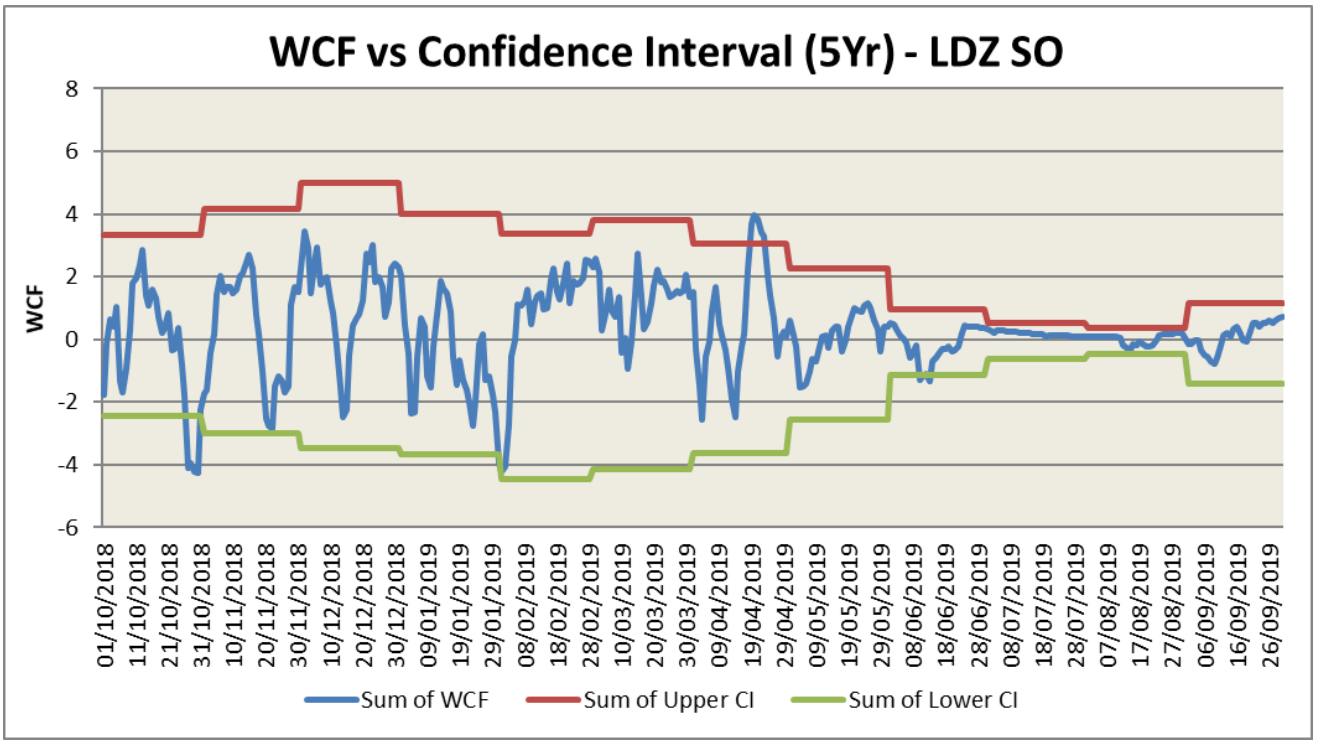


Figure S12.1.48 – WCF vs Confidence Intervals (LDZ SW) - Full Year

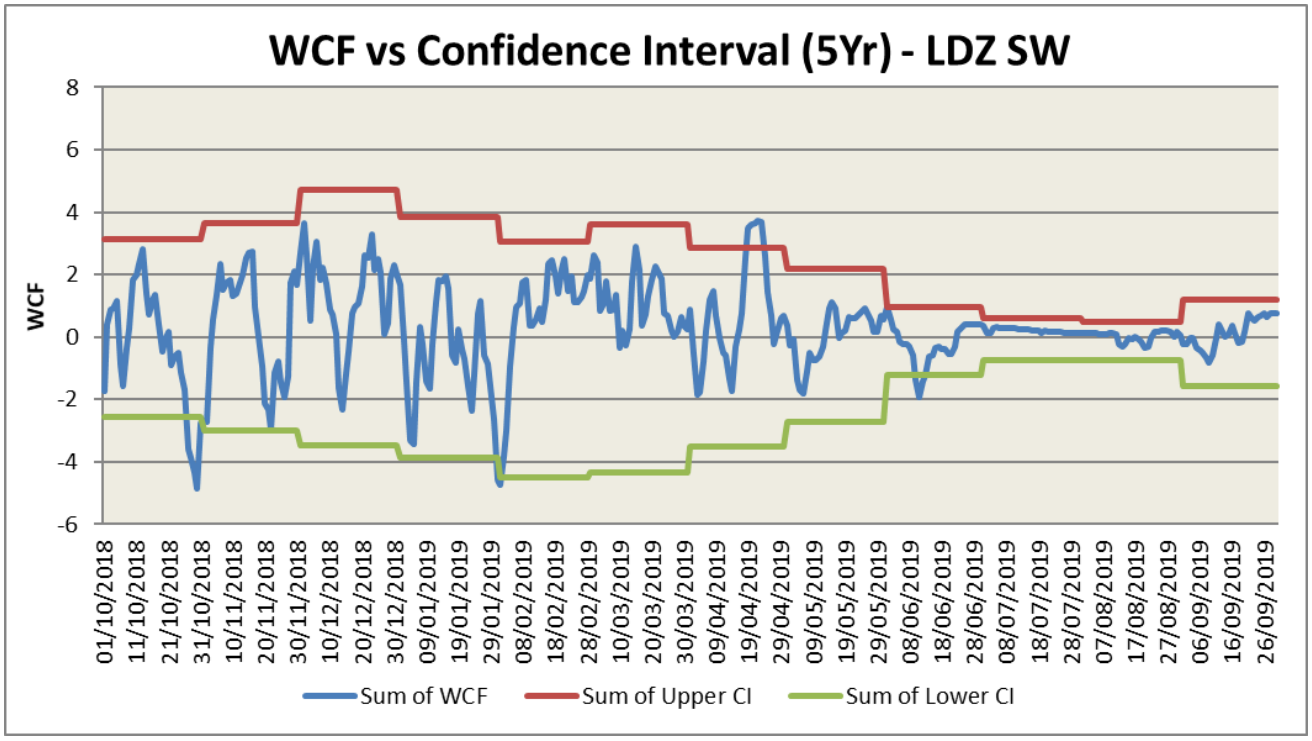


Figure S12.1.49 – Percentage of WCF Values within Confidence Intervals for each LDZ/Month

Month	SC	NO	NW / WN	NE	EM	WM	WS	EA	NT	SE	SO	SW
Oct'18	94%	90%	84%	84%	84%	87%	84%	87%	87%	87%	87%	84%
Nov'18	100%	100%	100%	100%	100%	100%	90%	100%	100%	100%	100%	100%
Dec'18	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Jan'19	97%	100%	97%	97%	97%	97%	97%	100%	97%	97%	97%	97%
Feb'19	64%	64%	75%	68%	71%	96%	96%	100%	100%	100%	100%	96%
Mar'19	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Apr'19	83%	90%	83%	90%	90%	83%	83%	87%	87%	87%	83%	83%
May'19	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Jun'19	100%	97%	90%	87%	87%	83%	87%	83%	83%	83%	90%	87%
Jul'19	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Aug'19	90%	100%	100%	100%	100%	100%	97%	100%	100%	100%	100%	100%
Sep'19	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

4. STRAND 2: UNIDENTIFIED GAS ANALYSIS

The concept of Unidentified Gas (UiG) was introduced on 1st June 2017 under Project Nexus, which introduced a revised NDM allocation formula bought about by UNC Modification 0432. Unidentified Gas forms part of daily gas allocation and is calculated as the balancing figure to ensure that within in each LDZ, total input matches total output. UiG is derived as follows:

Total LDZ Energy – (Shrinkage + DM Energy + Total LDZ NDM Energy) = UiG

The ideal UiG value is zero but it is worth noting that UiG can be a positive or negative value. UiG volatility may occur for a variety of reasons including imperfections in the NDM Algorithms themselves, but also errors in aggregate NDM AQs and in measured LDZ and DM consumption. If these factors are not material, a positive UiG value could indicate a tendency for the NDM algorithms to under allocate, whereas a negative UiG value could indicate the algorithm over allocates.

It is important to note that in the summer of 2018, in order to directly impact the overall levels and volatility of Unidentified Gas (UIG), DESC approved the application of 'Uplift' factors to the Annual Load Profiles (ALPs) and Daily Adjustment Factors (DAFs) for Gas Year 2018/19.

The analysis in this document reflects the actual observed values of UiG which has been influenced by the uplift factors.
Simulation analysis of alternative UiG values in the event that the uplift factors had not been applied was presented at DESC on 9th December.

The following analysis is based on gas year 18/19. The data was analysed by seasons which are defined as:

- Autumn: Oct '18 to Dec '18
- Winter: Jan '19 to Mar '19
- Spring: Apr '19 to Jun '19
- Summer: Jul '19 to Sep '19

A selection of bar charts and distribution graphs are presented below:

Figures S12.2.1 to S12.2.4 show the monthly average percentage (displayed by season) of Unidentified Gas for each LDZ observed during gas year 2018/19.

Figure S12.2.5 is a line graph showing the national daily UiG % values (at D+5) from 1st October 2018 to 30th September 2019.

Figures S12.2.6 to S12.2.9 show the national distribution of UiG % values by seasons.

During the analysis period of 1st October 2018 to 30th September 2019, the average UiG percentage levels by month and LDZ have not shown a strong bias towards positive or negative values, and have ranged from -25.40% (in NW LDZ during February'19) to +29.38% (in SW LDZ during October'18). When considering the percentage UiG ranges for the seasons, Autumn (Oct '18 to Dec '18) ranged from -21.00% to +29.38%, with 95% of UiG values between -12% and +10%. Winter (Jan '19 to Mar '19) ranged from -25.40% to +19.55%, with 95% of values between -11% and +9%. Spring (Apr '19 to Jun '19) ranged from -21.96% to +20.32%, with 95% of values between -13% and +16%. Summer (Jul '19 to Sep '19) ranged from -24.55% to +16.84%, with 95% of values between -14% and +12%.

Since its introduction on 1st June 2017, UiG has been somewhat variable with no apparent pattern or consistency in the day to day volatility. As described earlier, UiG volatility can occur for a number of reasons. The UiG taskforce, who's main purpose is to investigate the underlying reasons for UiG, continues its work and is providing recommendations to the industry via the Unidentified Gas Work Group.

Performance analysis of the NDM supply meter point demand formula is specifically assessed under Strand 3 'NDM Daily Demand Analysis'.

Figure S12.2.1 – Monthly average UiG% (at D+5) Autumn

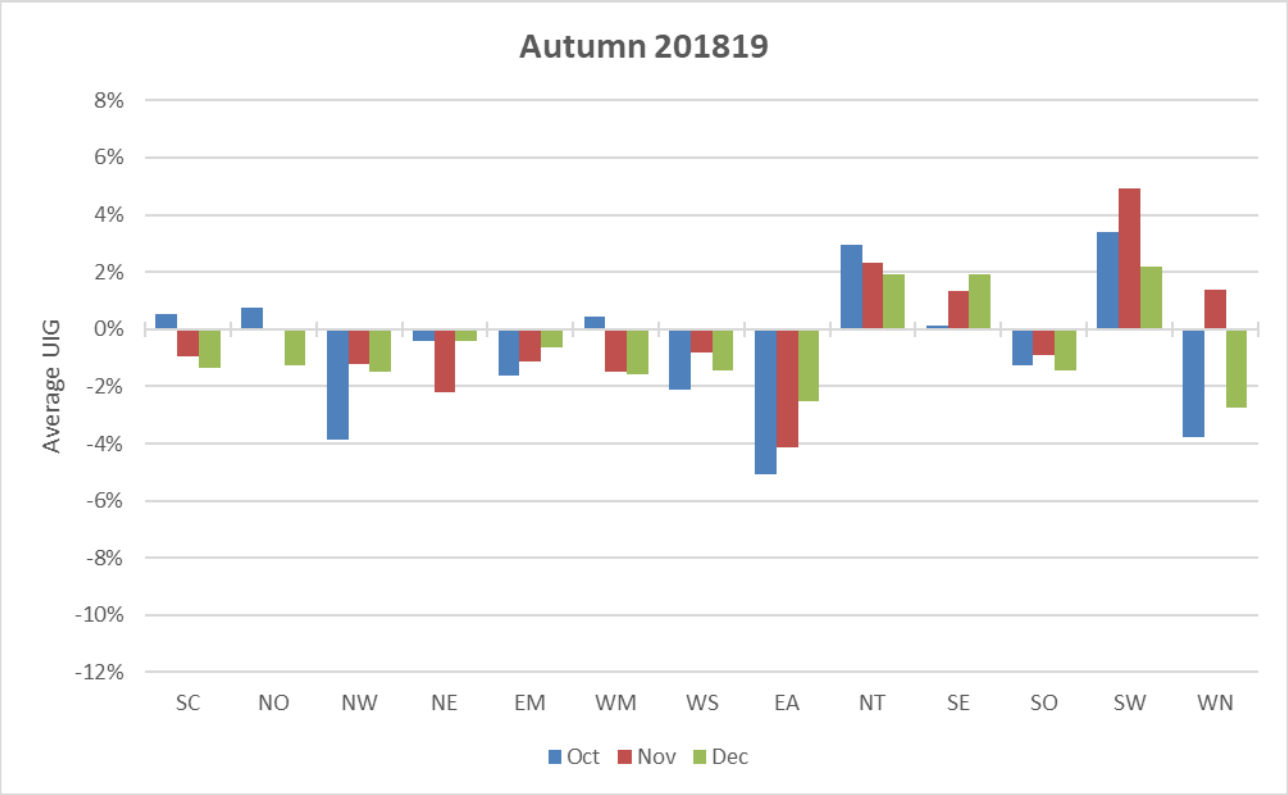


Figure S12.2.2 – Monthly average UiG% (at D+5) Winter

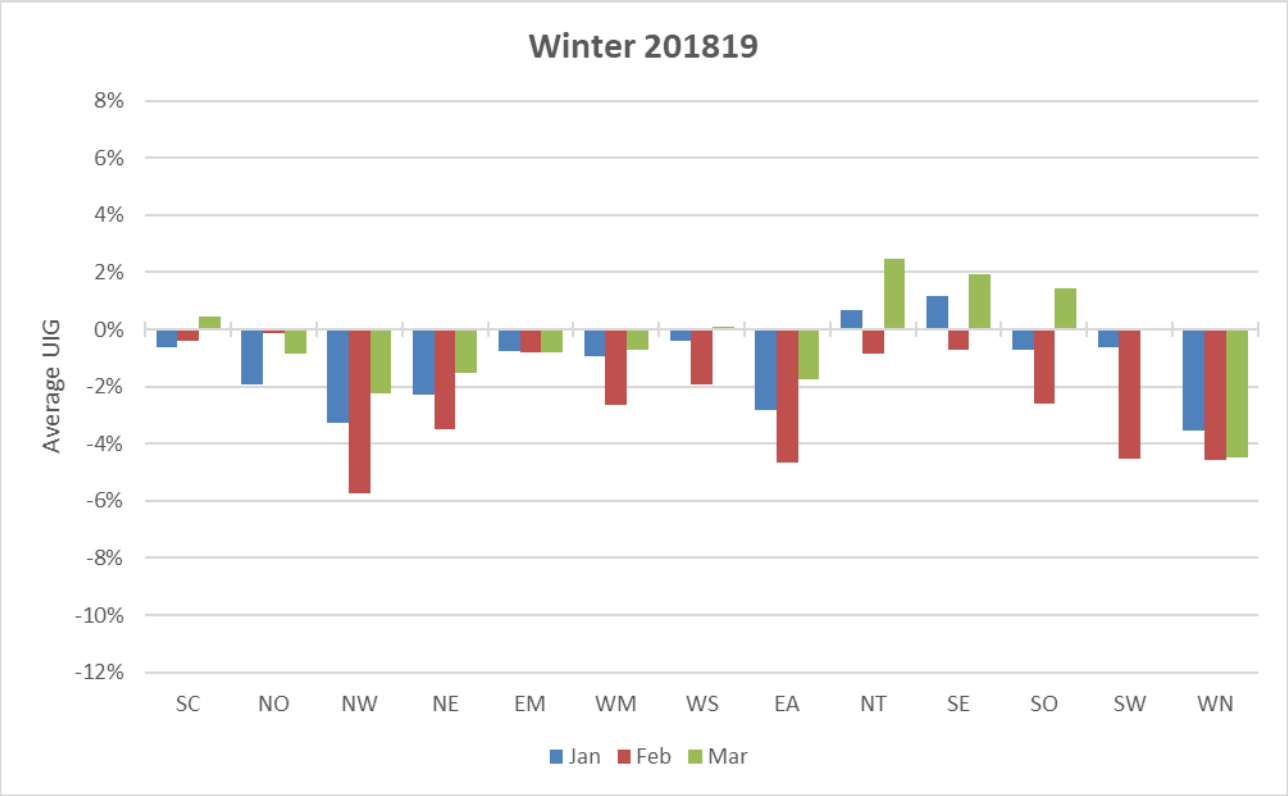


Figure S12.2.3 – Monthly average UiG% (at D+5) Spring

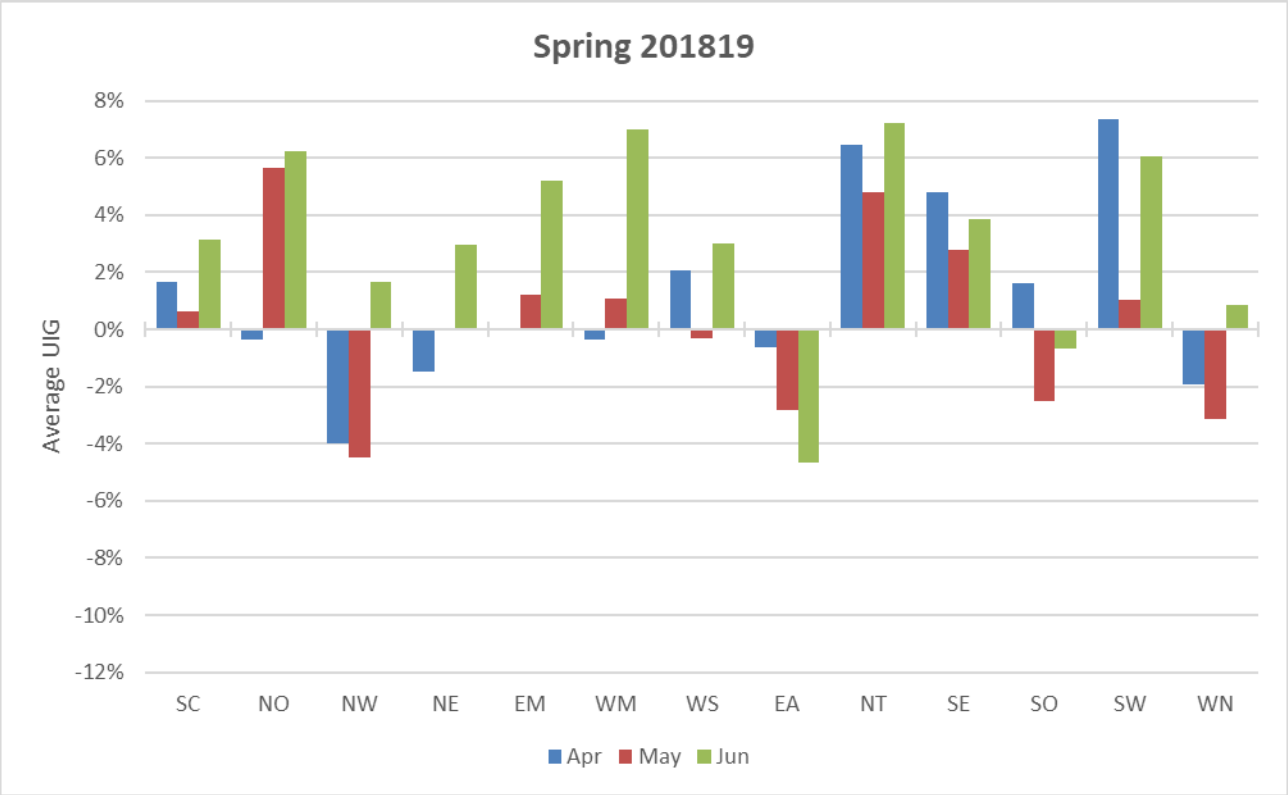


Figure S12.2.4 – Monthly average UiG (at D+5) Summer

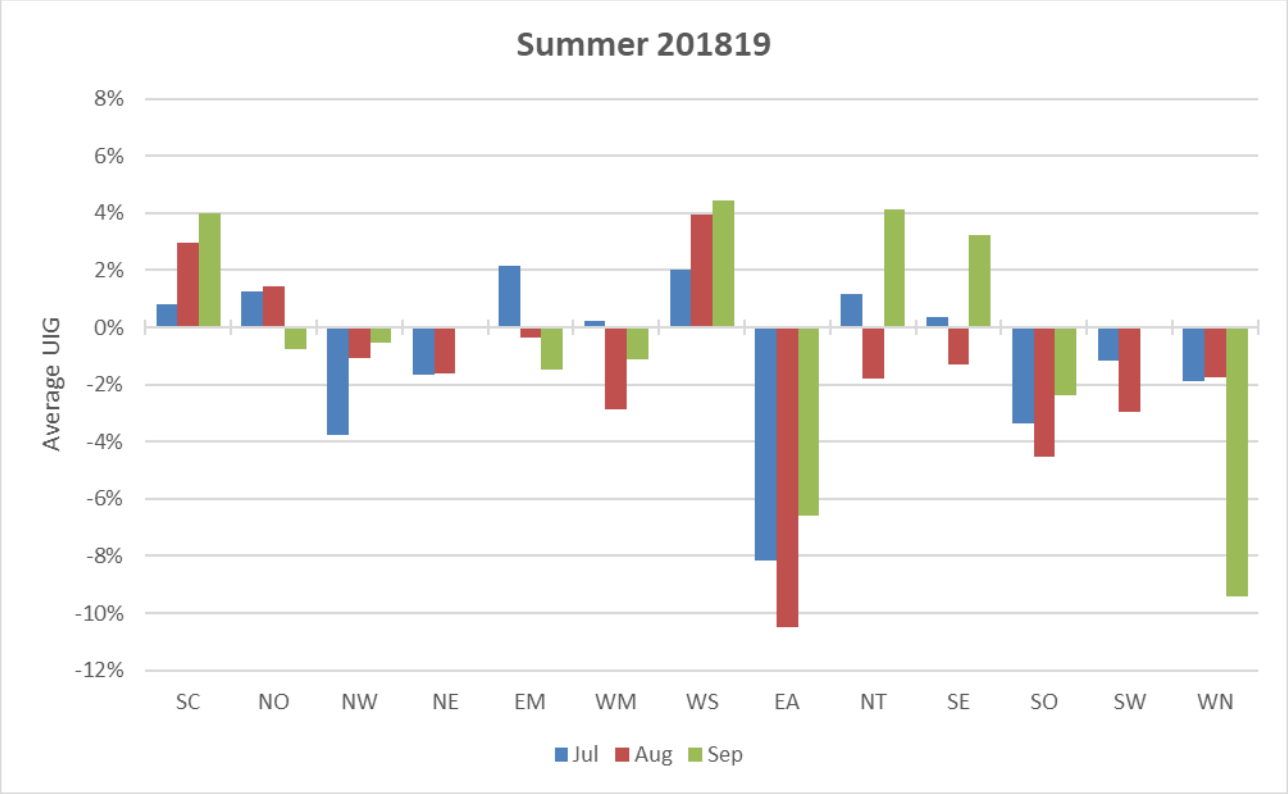


Figure S12.2.5 – National Daily UiG% values (D+5)

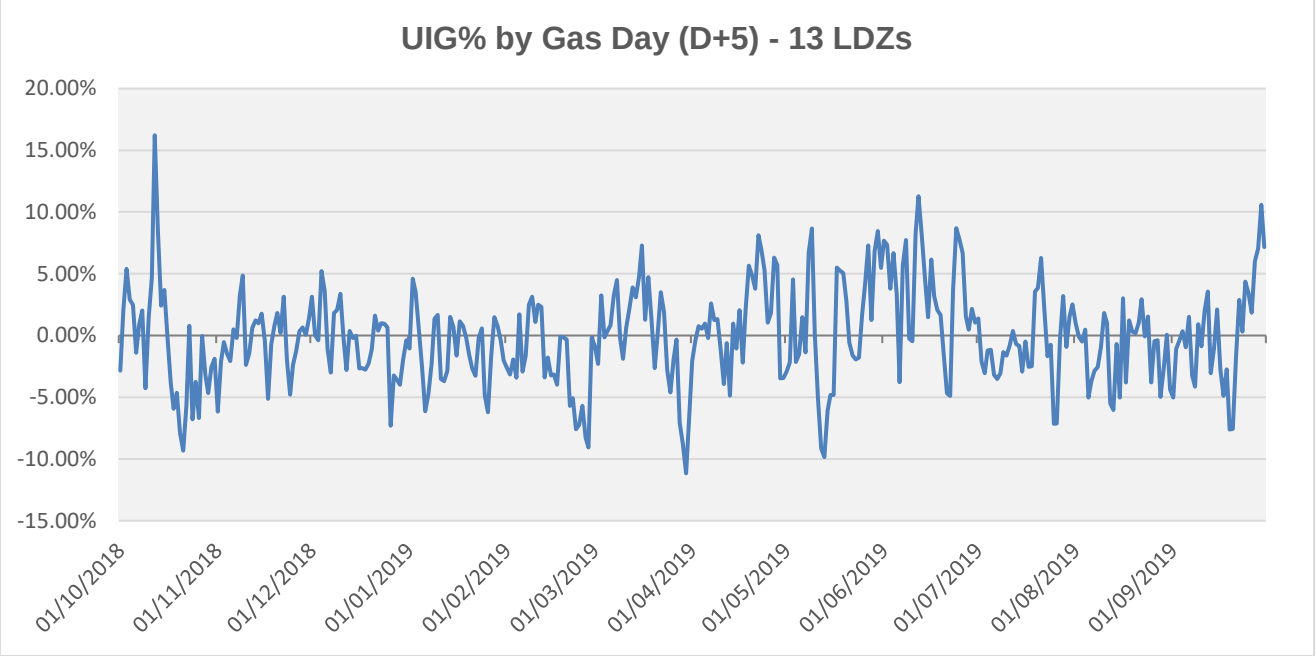


Figure S12.2.6 – Distribution of UiG % values by Season – Autumn

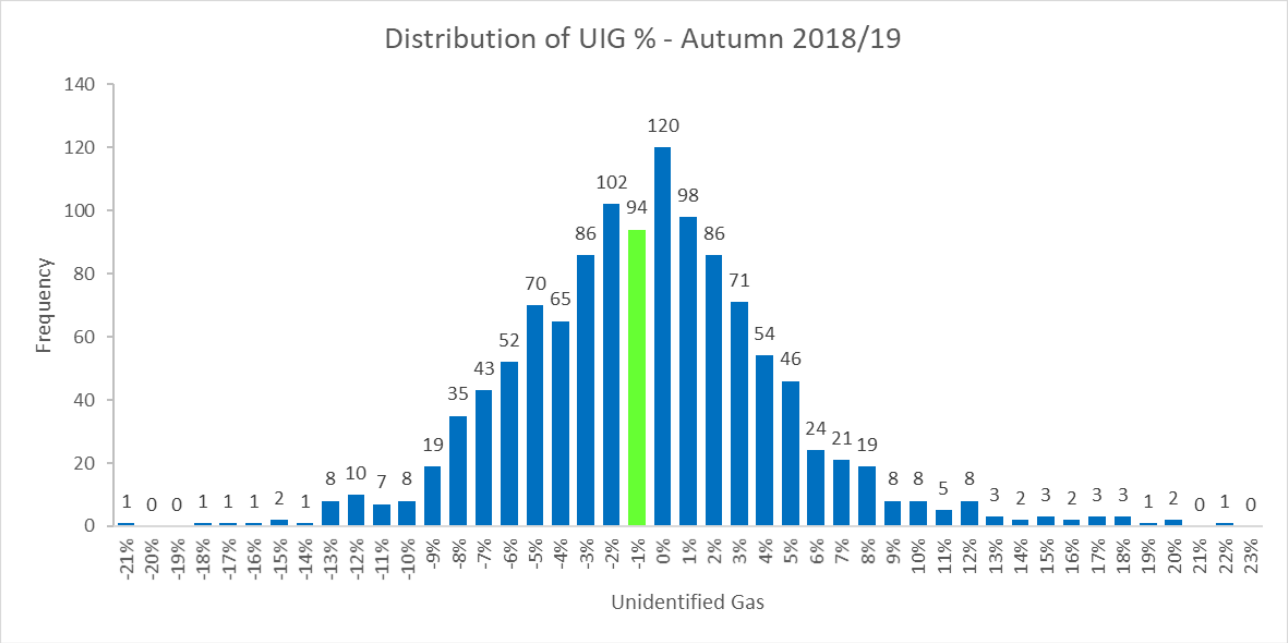


Figure S12.2.7 – Distribution of UiG % values by Season – Winter

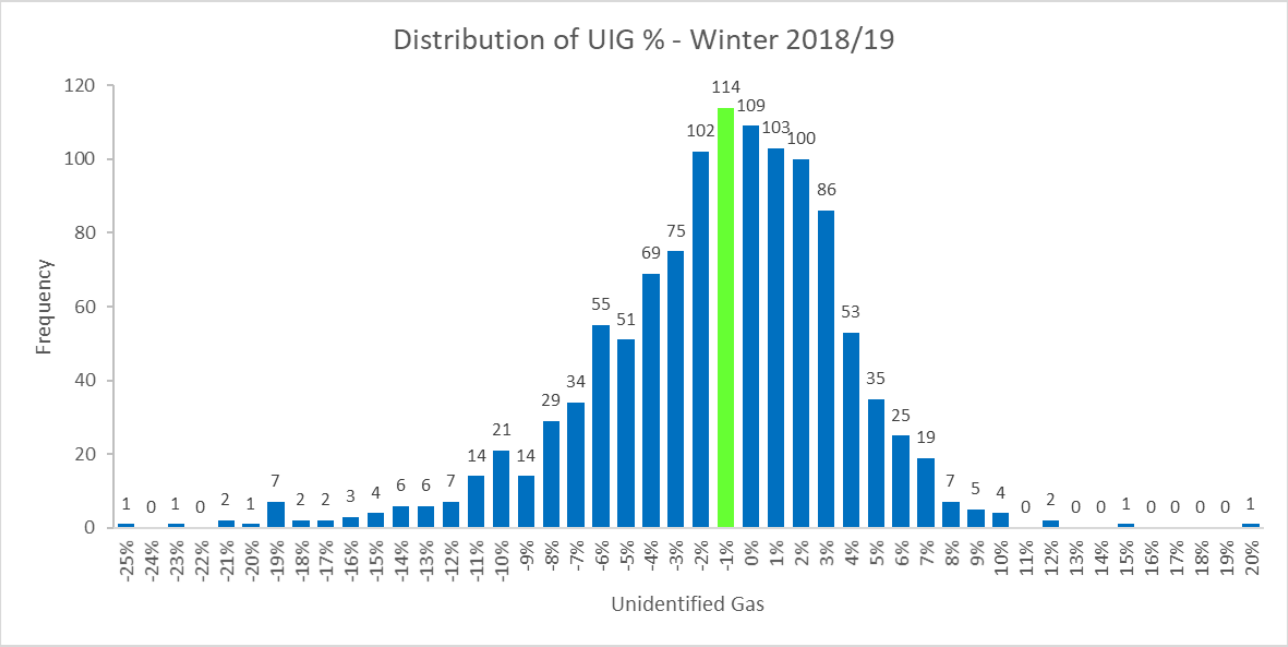


Figure S12.2.8 – Distribution of UiG % values by Season - Spring

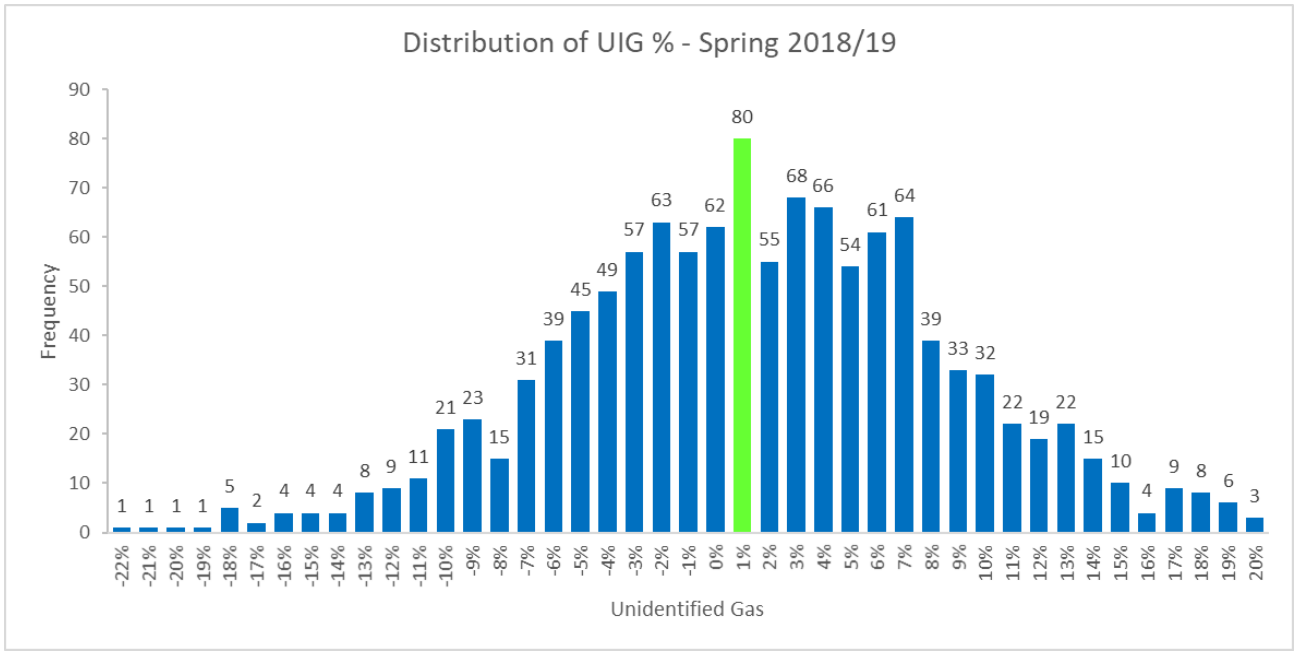
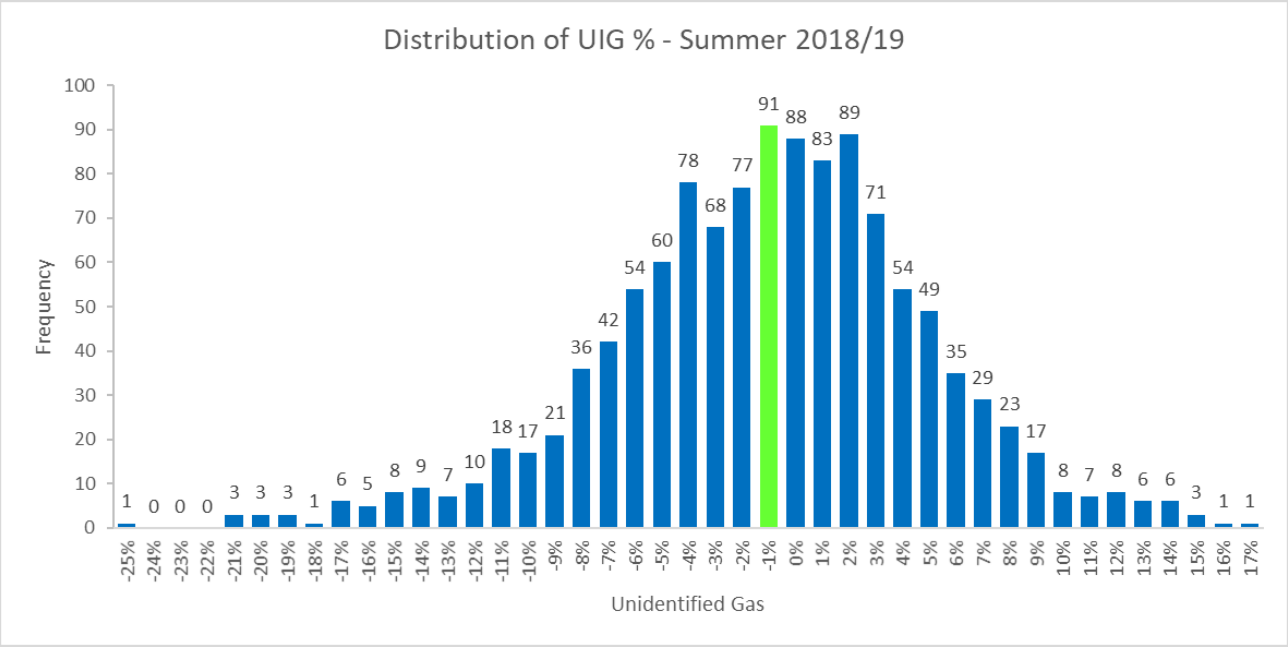


Figure S12.2.9 – Distribution of UiG % values by Season – Summer



5. STRAND 3: NDM DAILY DEMAND ANALYSIS

The performance of the NDM Supply Meter Point Demand Formula has been evaluated by comparing actual daily demands for supply points in the NDM sample with estimates of their daily demands (as per the NDM demand formula) across the range of EUCs (consumption bands only). This evaluation covers the period of the gas year 2018/19.

It is important to note that in the summer of 2018, in order to directly impact the overall levels and volatility of Unidentified Gas (UIG), DESC approved the application of 'Uplift' factors to the approved demand models for gas year 2018/19.

The table below shows the relevant uplift factors which applied to each LDZ for Gas Year 2018/19. DAF uplifts were applied to all EUC bands whereas ALP uplifts applied to EUC band 01B only. For the purpose of these uplift factors, 'Winter' refers to the months of October to March inclusive and 'Summer' refers to the months of April to September inclusive.

LDZ	DAF Uplifts (applied to all EUC bands)	ALP Uplifts (applied to EUC band 01B only)	
	Full gas year	Winter	Summer
EA	1.04	1.07	1.08
EM	1.06	1.05	1.03
NE	1.09	1.08	1.05
NO	1.09	1.05	1.05
NT	1.04	1.02	1.01
NW	1.00	1.08	1.06
SC	1.09	1.04	1.04
SE	1.07	1.01	1.00
SO	1.07	1.05	1.04
SW	1.08	1.03	1.02
WM	1.02	1.04	1.04
WN	1.00	1.09	1.07
WS	1.05	1.04	1.03

The performance of the algorithms has been evaluated on three bases:

i) MODEL(inc) – allocated using 2018/19 ALPs, DAFs (including 'Uplift' factors), WCFs and NDM sample derived AQs

ii) MODEL(exc) – allocated using 2018/19 ALPs, DAFs (excluding 'Uplift' factors), WCFs and NDM sample derived AQs

iii) RETRO – allocated using 2019/20 ALPs, DAFs (excluding 'Uplift' factors, adjusted to apply to pattern of days/holidays in 2018/19), WCFs and NDM sample derived AQs

The 'Model(inc)' analysis is based on the algorithms that applied to the gas year being analysed (i.e. 2018/19) including the 'Uplift' factors, whereas the 'Model(exc)' analysis shows how the models would have performed had the factors not been applied.

The 'Retro' analysis is based on the algorithms derived for the current gas year (i.e. 2019/20) without any uplift factors but retro fitted with appropriate adjustment for the pattern of days of the week and holidays for gas year 2018/19. This analysis is helpful in assessing the performance of the most current algorithms had they applied to the gas year being analysed.

The AQs used in all the analysis bases are based on the consumption data of the sample itself rather than system AQs, which removes bias which might be introduced as a result of any erroneous AQs.

Analysis is performed on supply meter points which comprise the Demand Estimation Sample, where actual daily consumption values are known for days within the gas year being analysed. Daily NDM consumption data for gas year 2018/19 was available from three sources, namely 'Xoserve managed', 'Network managed' (both of which are long established datasets) and 'Third Party provided' which has been provided voluntarily by shippers. Only supply meter points that are NDM and have passed data

validation can be used. Figure S12.3.1 shows the number of validated supply meter points, by LDZ and EUC band, which have been used in this NDM Daily Demand Analysis. It is worth noting at the outset that some EUC & LDZ combinations contain either no sample data and therefore no analysis is possible or very few validated sample points, which can skew the results significantly. Additionally, results for band 09 are unreliable and are disregarded in this assessment, as this band is represented by a very small number of supply meter points distributed in only some of the 13 LDZs. Analysis has been performed on consumption band EUCs only, as generally the number of validated supply meter points available are not sufficient to perform analysis on WAR (Winter Annual Ratio) band EUCs.

Figures S12.3.2 to S12.3.9 are graphs showing actual demand and allocated demand on the 'Model(inc)', 'Model(exc)' and 'Retro' bases for each consumption band. In general, the allocated demand on the three bases was close to the actual demand for each consumption band on most days. For band 01, the most notable exceptions occurred during the much warmer than normal weather during most of February 2019, the latter half of March 2019 and in late September 2019, and during the colder than normal spells in early May 2019 and mid-June 2019. For bands 02 through to 08, the most notable deviation occurred during the much colder than normal weather in early April'19 and the much warmer than normal period during Easter'19 (19th to 22nd April).

Mean Absolute Percentage Error (MAPE) is a measure of prediction accuracy of a forecasting method. MAPE analysis has been performed for each EUC consumption band against the three bases for Winter, Summer and Full Year periods. This is the first time that MAPE has been used in this analysis, with previous years having been assessed using overall percentage error which can hide the daily error (MAPE removes any 'netting off' of error). The lower the MAPE value, the closer the prediction was to the actual value. For example, a MAPE of 3% means that, on average, the forecast is out by 3%.

Tables showing the MAPE for the full year and for winter and summer separately, by LDZ for each of the three bases, are attached as Figures S12.3.10 to S12.3.18. Note that the tables for the 'Retro' basis also include analysis of the dedicated profiles for I&C sites in Band 01B and Domestic sites in Band 02B, both of which became effective for gas year 2019/20.

Figures S12.3.19 and S12.3.21 are bar charts showing a simple summary of the overall picture given by these three sets of tables, achieved using a weighted average MAPE across LDZs based on validated supply meter points. The overall MAPE has been summarised over the full year, winter and summer periods for EUCs in each consumption band.

Figures S12.3.22 to S12.3.29 are monthly bar charts comparing actual and allocated demands, across all LDZs for consumption bands 01 to 08 respectively.

Figures S12.3.30 to S12.3.33 are graphs showing actual demand and allocated demand analysis for sites which will be affected by the dedicated profiles for I&C sites in Band 01B and Domestic sites in Band 02B, which became effective for gas year 2019/20.

Finally, Figure S12.3.34 is a table showing comparison of full year MAPE by EUC on the 'Retro' basis, against the equivalent analysis using sample data from the previous years' analysis.

3.1 Analysis

On the evidence of the bar chart in Figure S12.3.19, consumption band MAPE values on the 'Model(inc)' basis over the full year (gas year 2018/19) range from 5.97% to 17.63%. Overall, consumption band winter period errors range from 4.69% to 19.06% and overall consumption band summer period errors range from 7.2% to 17.14%. Actual summer demands are lower and hence percentage errors can be somewhat greater in the summer.

The bar chart in Figure S12.3.20 shows how the models for gas year 2018/19 without the uplifts would have performed if they had been applied. Most bands show a small reduction in MAPE when compared to the 'Model(exc)' basis meaning an improvement to allocation. Full year MAPE values ranged from 5.93% to 17.64% with Band 01B displaying the most significant MAPE reduction (10.44% to 9.03%), most likely due to the ALP uplift which only applied to this band.

The bar chart in Figure S12.3.21 (Retro) shows that the algorithms derived for 2019/20 would (if applied to gas year 2018/19) have resulted in reduced allocation error in most consumption bands. MAPE values on the Retro basis over the full year range from 5.71% to 17.52%.

It must be borne in mind that all three analyses are based on validated NDM sample data which is not necessarily representative of the population as a whole. Furthermore, this sample dataset suffers from small numbers of contributing supply meter points at the higher consumption bands and results for bands 01B and 02B are susceptible to 'Market Sector Code' errors.

The selection of monthly charts in Figures S12.3.22 to S12.3.29 show for each month of gas year 2018/19, actual demand and allocated demand on the 'Model(inc)', 'Model(exc)' and 'Retro' bases. In interpreting these monthly charts, it is relevant to recall the weather conditions that prevailed during gas year 2018/19 (please refer to section 3 of this document - Strand 1 Weather Analysis).

Please note that the following assessments considers the analysis from the 'Model(exc)' basis:

The monthly chart for band 01, in Figure S12.3.22, indicates under allocation in all winter months except February 2019, which was a warmer than normal month. During the summer, over allocation was evident for all months with the exception of June 2019.

The monthly chart for band 02, in Figure S12.3.23, indicates winter over allocation from October 2018 to February 2019 and under allocation for each of the summer months.

Figure S12.3.24 is the monthly chart for band 03, which shows over allocation during the winter months with the exception of October 2018 and March 2019 but also shows under allocation during each of the summer months.

The monthly charts for bands 04 and 05 (Figures S12.3.25 and S12.3.26) both show mostly over allocation in the winter, the exception being in March 2019. Under allocation was evident during the summer months of April, May and June 2019.

Figure S12.3.27 is the monthly chart for band 06, which shows mostly over allocation in the winter and the summer periods, with the exceptions being in November 2018, March 2019 and April 2019.

The monthly chart for band 07, Figure S12.3.28, shows a tendency for over allocation over the winter and summer months (except in March and April 2019).

Figure S12.3.29 is the monthly chart for band 08, which shows over allocation in all winter months and all but one of the summer months (June 2019 was the only summer month to show under allocation).

Change proposal XRN4665 – "Creation of New End User Categories", introduced dedicated allocation profiles (effective from 1st October 2019) for Domestic, Industrial and Commercial and Pre-Payment customers in bands 01 and 02. Third party provided data has enabled analysis of the new profiles for 'I&C' consumers in band 01 and Domestic consumers in band 02. Figure S12.3.30 shows daily actual and allocated demand for 3,267 available I&C sites in band 01B on the 'Model(exc)' basis (using the generic 01B Domestic profile applicable for gas year 2018/19). This profile clearly doesn't provide a great fit for I&C customers, since it was modelled using data from Domestic consumers. Figure S12.3.31 displays the results of applying the dedicated I&C profile which went live for gas year 2019/20 (on 'Retro' basis) to the same sampled sites and shows notable improvements and 'better fit', although allocation error appears more pronounced during later part of the Summer period (i.e. July to September 2019). Figures S12.3.32 and S12.3.33 show daily actual and allocated demand for 102 Domestic sites in band 02 using the traditional consumption band profile on 'Model(exc)' and the 'Domestic' specific profile on 'Retro' basis respectively. Improvements to allocation using the 'Domestic' specific profile are observed, with full year MAPE improving from 18.66% to 14.81%. Visually, an improvement in allocation is clearer during the winter period than during the summer period but both these periods show an improved MAPE. We should consider that these results may be affected by the small number of sites used in this assessment and/or the possibility of an incorrectly assigned market sector code.

From the comparison summary shown in Figure S12.3.34, all bands show an improvement in full year MAPE, with the exception of 06B and 08B. The observed improvements in allocation support DESC's approach of creating additional EUCs in bands 01 and 02.

In conclusion, the algorithms which applied for gas year 2018/19 did a good job of influencing UIG levels (as per Strand 2 Unidentified Gas Analysis) but did not improve the accuracy of NDM allocation. The full year MAPE values improved when using the models without uplifts, except in 07B & 08B which were marginally worse. Assessment of the 2019/20 algorithms showed further improvements in most of the consumption bands which were analysed.

Allocation using the dedicated profiles for I&C sites in Band 01B and Domestic sites in Band 02B showed clear improvement and supports DESC's decision to introduce these new EUCs.

Figure S12.3.1 – Validated Sample Site Breakdown

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	ALL LDZs	% Non-Third Party	% Third Party
01B Dom	193	180	185	210	193	215	49	183	206	193	213	205	225	2,450	63%	37%
01B I&C	505	216	349	213	259	242	48	119	333	265	334	186	198	3,267	4%	96%
02B Dom	15	5	8	6	10	10	0	3	10	10	6	8	11	102	100%	0%
02B I&C	774	240	449	223	441	454	36	128	519	412	417	347	291	4,731	21%	79%
03B I&C	801	139	253	160	245	206	38	55	233	238	279	204	189	3,040	37%	63%
04B I&C	621	208	239	276	182	211	34	81	221	243	393	286	152	3,147	66%	34%
05B I&C	252	105	111	129	99	122	14	36	82	137	156	98	63	1,404	79%	21%
06B I&C	88	35	35	48	50	44	4	17	23	36	39	40	28	487	89%	11%
07B I&C	30	10	21	21	25	19	1	5	9	5	14	10	14	184	91%	9%
08B I&C	8	7	6	5	12	12	1	4	6	5	3	4	5	78	90%	10%
Total	3,287	1,145	1,656	1,291	1,516	1,535	225	631	1,642	1,544	1,854	1,388	1,176	18,890		

Figure S12.3.2 – Daily Actual and Allocated Demands for 01B (across all LDZs)

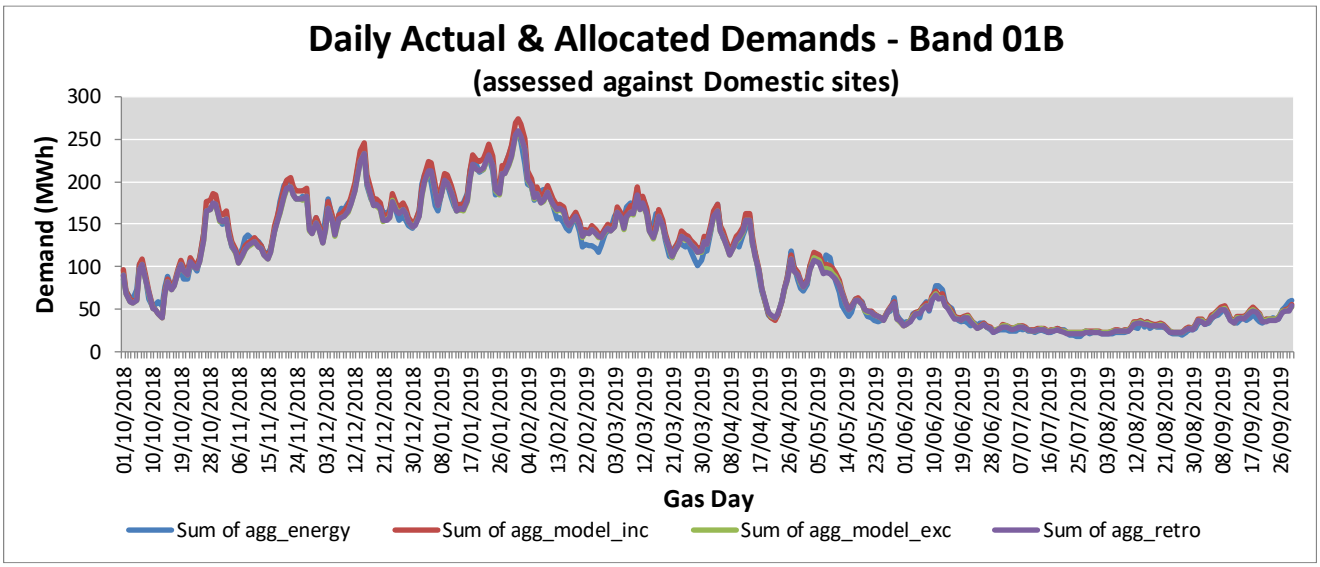


Figure S12.3.3 – Daily Actual and Allocated Demands for 02B (across all LDZs)

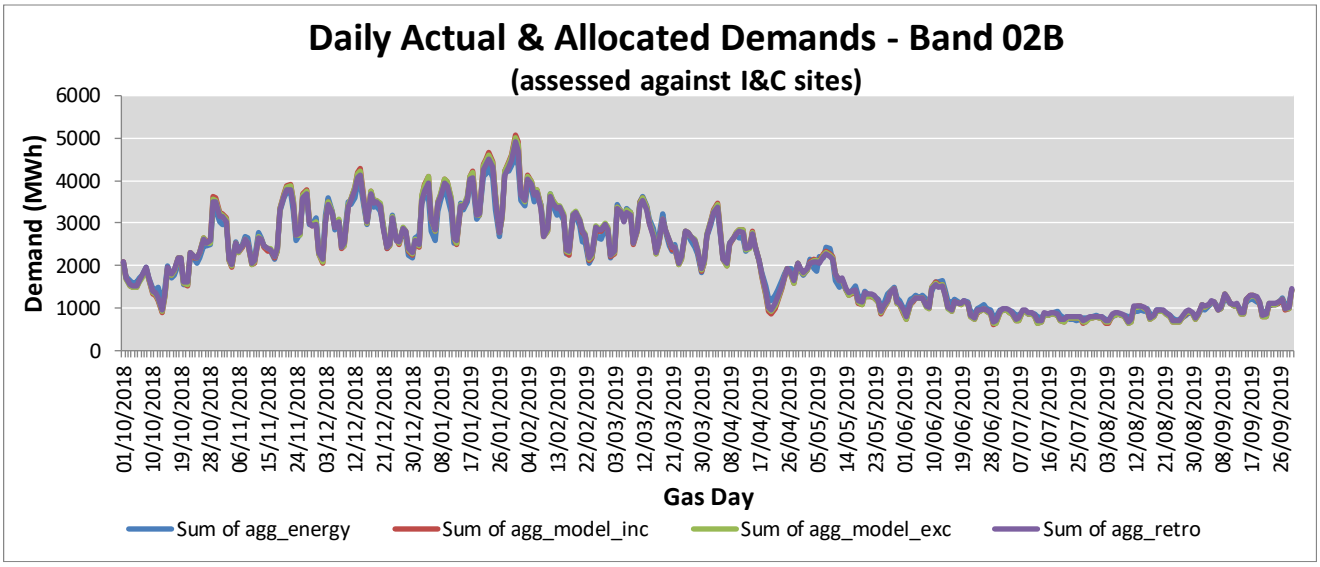


Figure S12.3.4 – Daily Actual and Allocated Demands for 03B (across all LDZs)

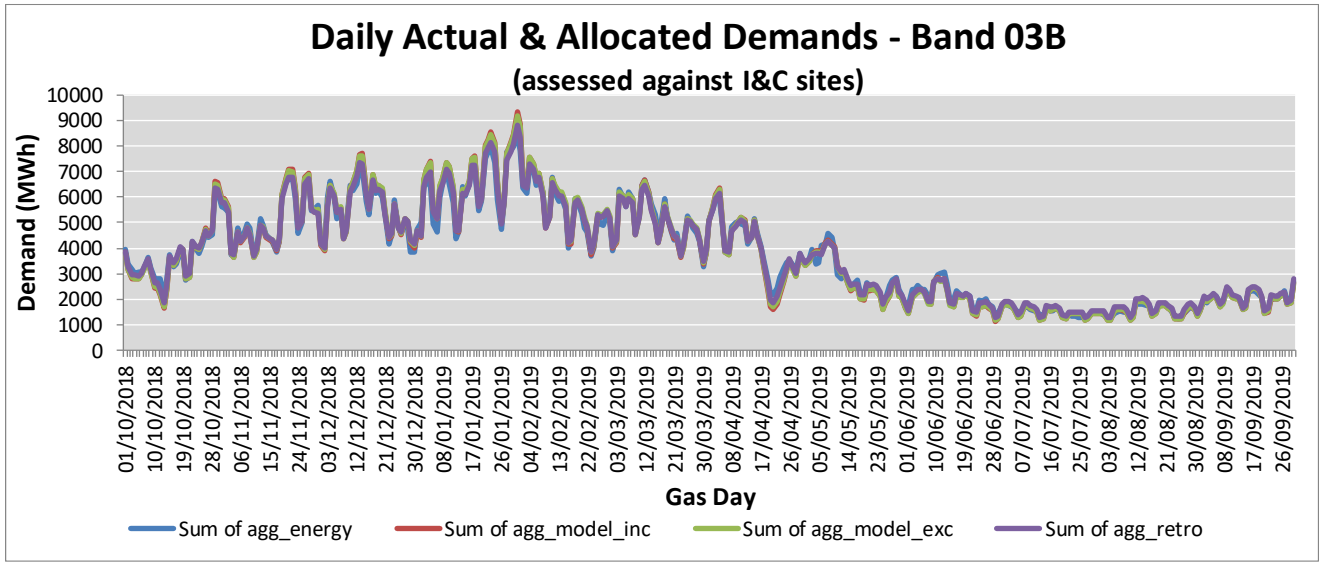


Figure S12.3.5 – Daily Actual and Allocated Demands for 04B (across all LDZs)

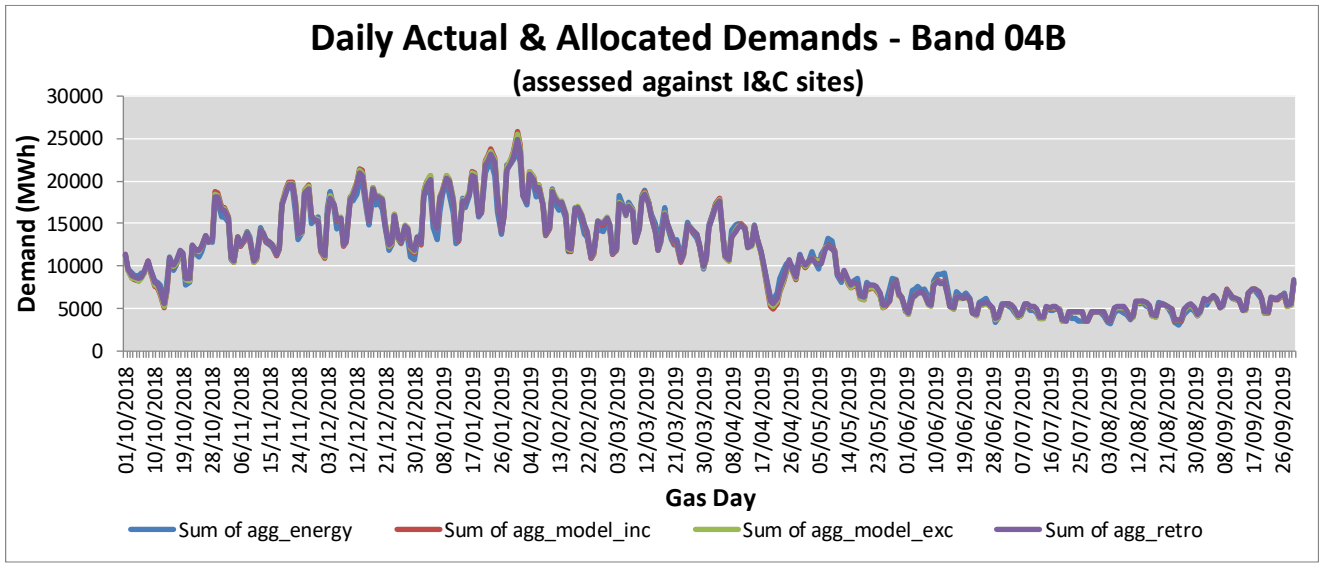


Figure S12.3.6 – Daily Actual and Allocated Demands for 05B (across all LDZs)

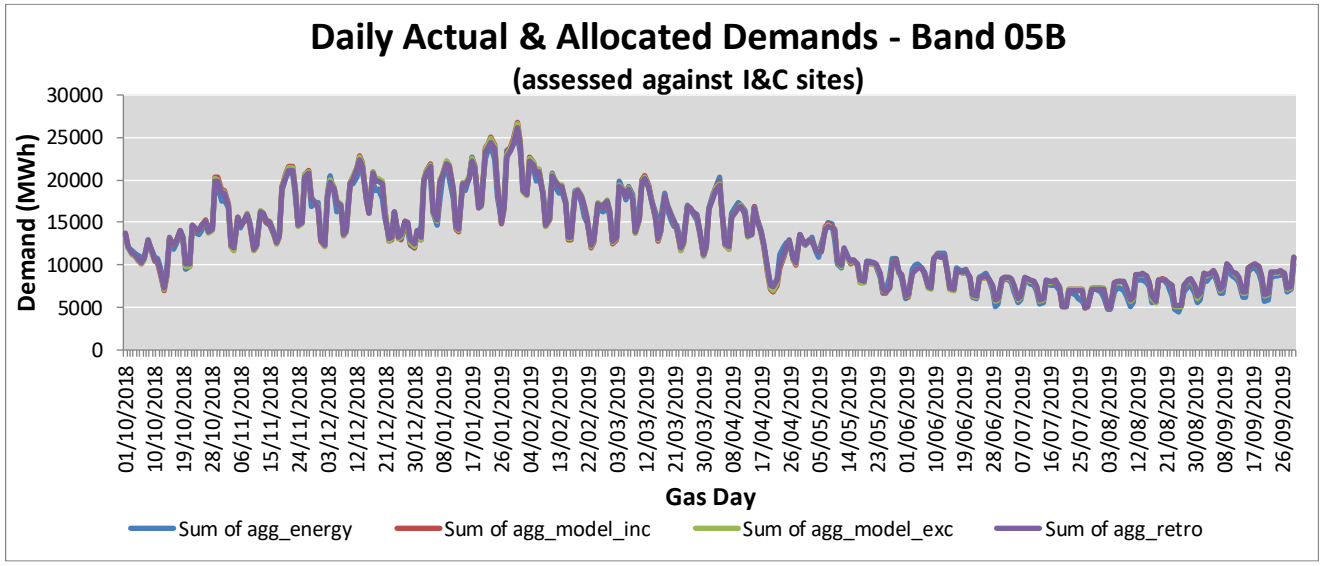


Figure S12.3.7 – Daily Actual and Allocated Demands for 06B (across all LDZs)

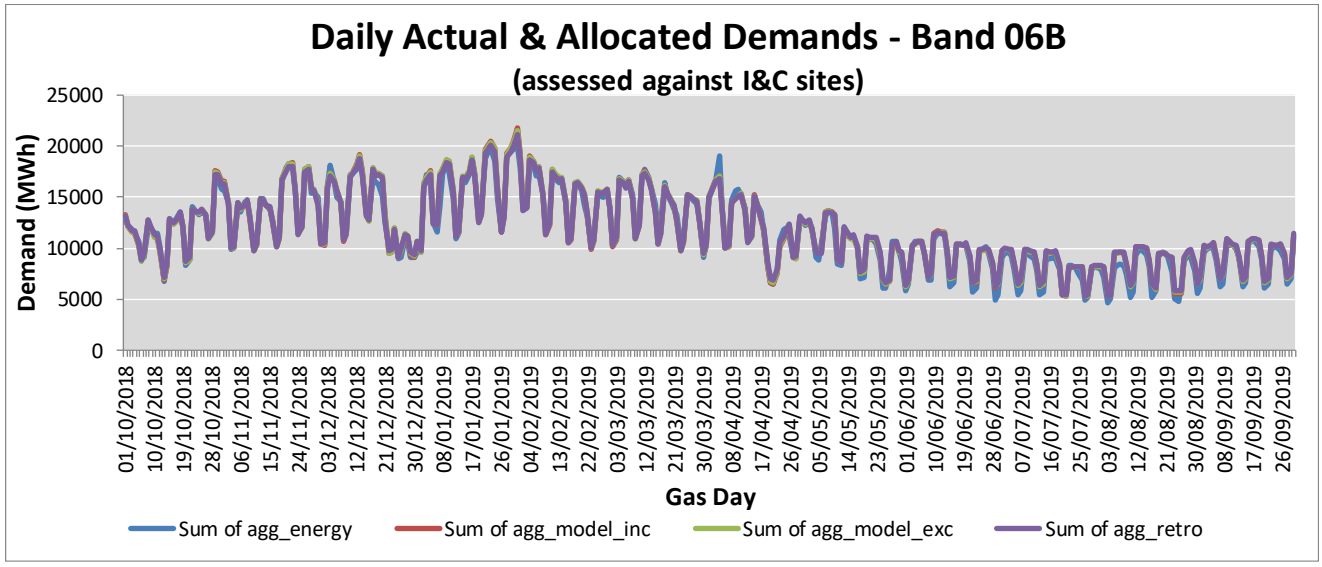


Figure S12.3.8 – Daily Actual and Allocated Demands for 07B (across all LDZs)

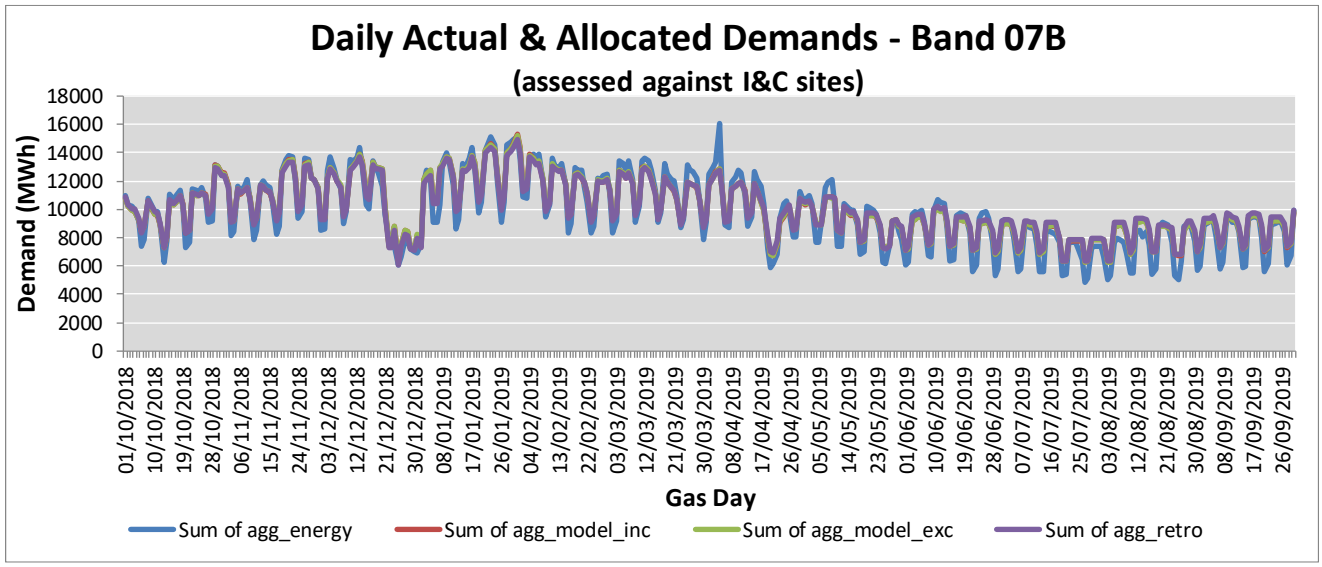


Figure S12.3.9 – Daily Actual and Allocated Demands for 08B (across all LDZs)

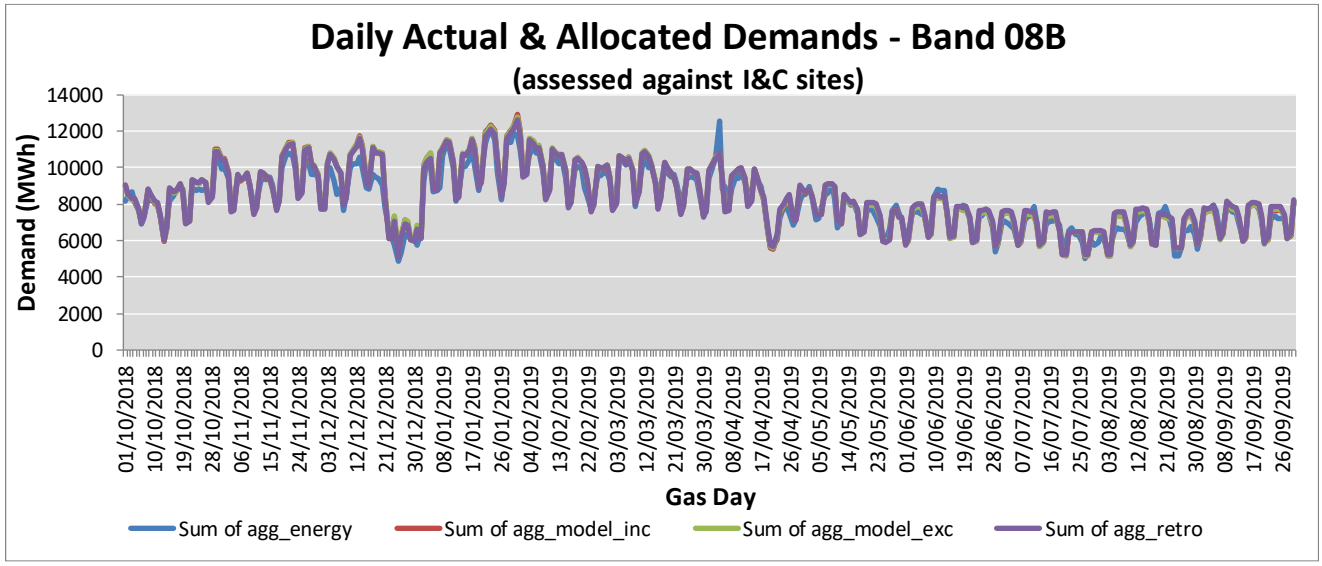


Figure S12.3.10 – MAPE over Full Year (Oct'18 to Sep'19) on MODEL(inc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	9.64%	9.68%	14.33%	13.81%	12.19%	13.50%	16.93%	9.82%	9.36%	6.84%	5.97%	8.37%	10.27%	10.44%
02B (I&C)	8.96%	6.87%	7.60%	9.11%	10.00%	8.89%	9.31%	12.47%	8.38%	5.79%	6.43%	8.27%	9.01%	8.31%
03B (I&C)	7.25%	6.44%	7.90%	6.44%	9.31%	10.39%	9.00%	12.77%	7.21%	5.61%	6.50%	8.78%	12.94%	7.98%
04B (I&C)	5.44%	6.50%	6.18%	6.11%	5.83%	6.79%	10.62%	8.05%	6.45%	5.16%	4.82%	5.90%	8.24%	6.01%
05B (I&C)	3.92%	5.31%	6.07%	8.25%	7.34%	7.04%	15.07%	7.65%	6.05%	6.05%	4.55%	5.85%	6.69%	5.97%
06B (I&C)	4.76%	10.22%	6.60%	6.79%	7.67%	10.64%	16.97%	8.57%	11.03%	10.01%	6.81%	8.06%	8.35%	7.88%
07B (I&C)	10.05%	20.14%	9.41%	14.05%	5.85%	21.58%	n/a	28.29%	19.56%	15.65%	18.13%	15.22%	10.93%	14.29%
08B (I&C)	11.13%	14.37%	9.31%	14.24%	10.91%	19.06%	n/a	28.01%	10.18%	8.93%	12.09%	20.65%	17.42%	17.63%

Figure S12.3.11 – MAPE over Winter (Oct'18 to Mar'19) on MODEL(inc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	4.74%	5.97%	8.41%	7.89%	6.04%	5.75%	13.35%	7.85%	8.04%	5.11%	4.82%	5.98%	9.55%	6.83%
02B (I&C)	6.68%	5.82%	6.35%	6.60%	6.48%	6.56%	7.94%	8.04%	5.79%	4.19%	4.55%	7.13%	8.21%	6.24%
03B (I&C)	5.78%	5.59%	5.96%	5.20%	6.77%	7.54%	8.47%	8.26%	5.76%	4.57%	4.79%	8.02%	11.30%	6.34%
04B (I&C)	4.19%	5.30%	4.94%	5.63%	4.30%	5.25%	9.14%	6.97%	4.80%	3.77%	3.83%	4.71%	7.26%	4.81%
05B (I&C)	3.46%	4.92%	4.52%	7.67%	5.21%	5.16%	10.90%	5.58%	3.71%	3.19%	3.50%	5.56%	5.85%	4.69%
06B (I&C)	4.69%	5.11%	4.60%	6.91%	4.62%	6.56%	19.50%	6.62%	6.20%	8.65%	6.07%	7.61%	5.68%	6.06%
07B (I&C)	6.10%	14.70%	9.45%	11.24%	4.49%	14.15%	n/a	15.30%	10.64%	12.92%	15.50%	15.75%	12.95%	11.43%
08B (I&C)	12.88%	17.52%	7.70%	14.38%	10.54%	11.60%	n/a	22.30%	11.09%	8.69%	12.34%	14.14%	19.94%	19.06%

Figure S12.3.12 – MAPE over Summer (Apr'19 to Sep'19) on MODEL(inc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	14.51%	13.37%	20.22%	19.70%	18.31%	21.20%	20.49%	11.78%	10.68%	8.57%	7.11%	10.75%	10.98%	14.03%
02B (I&C)	11.23%	7.92%	8.84%	11.61%	13.52%	11.20%	10.68%	16.88%	10.96%	7.39%	8.29%	9.40%	9.81%	10.37%
03B (I&C)	8.72%	7.28%	9.82%	7.68%	11.85%	13.23%	9.53%	17.26%	8.66%	6.64%	8.19%	9.54%	14.57%	9.61%
04B (I&C)	6.68%	7.69%	7.41%	6.58%	7.35%	8.32%	12.08%	9.12%	8.09%	6.54%	5.80%	7.08%	9.21%	7.20%
05B (I&C)	4.37%	5.69%	7.61%	8.84%	9.47%	8.91%	19.21%	9.72%	8.39%	8.88%	5.60%	6.14%	7.52%	7.25%
06B (I&C)	4.84%	15.29%	8.58%	6.67%	10.71%	14.69%	14.45%	10.51%	15.85%	11.37%	7.55%	8.51%	10.99%	9.68%
07B (I&C)	13.98%	25.55%	9.37%	16.84%	7.20%	28.97%	n/a	41.20%	28.42%	18.36%	20.75%	14.69%	8.93%	17.14%
08B (I&C)	9.38%	11.24%	10.90%	14.10%	11.28%	26.48%	n/a	33.68%	9.28%	9.17%	11.85%	27.13%	14.91%	16.20%

Figure S12.3.13 – MAPE over Full Year (Oct'18 to Sep'19) on MODEL(exc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	8.58%	8.34%	11.83%	11.67%	11.35%	12.03%	13.77%	9.02%	6.27%	6.46%	5.52%	6.74%	9.43%	9.03%
02B (I&C)	8.98%	6.66%	7.60%	8.72%	9.82%	8.77%	9.31%	12.31%	8.23%	5.64%	6.17%	7.94%	8.55%	8.15%
03B (I&C)	7.25%	6.13%	7.90%	6.32%	9.03%	10.30%	9.00%	12.72%	6.98%	5.41%	6.07%	8.35%	12.55%	7.81%
04B (I&C)	5.50%	6.22%	6.18%	5.90%	5.78%	6.76%	10.62%	7.96%	6.45%	5.04%	4.72%	5.76%	7.97%	5.93%
05B (I&C)	3.94%	5.18%	6.07%	8.28%	7.31%	7.00%	15.07%	7.62%	6.01%	5.98%	4.49%	5.78%	6.49%	5.93%
06B (I&C)	4.77%	10.31%	6.60%	6.79%	7.69%	10.66%	16.97%	8.58%	11.08%	9.98%	6.67%	8.03%	8.35%	7.87%
07B (I&C)	10.05%	20.19%	9.41%	14.07%	5.87%	21.60%	n/a	28.25%	19.59%	15.67%	18.09%	15.19%	10.94%	14.30%
08B (I&C)	11.16%	14.42%	9.31%	14.25%	10.92%	19.06%	n/a	28.05%	10.19%	8.93%	12.11%	20.67%	17.44%	17.64%

Figure S12.3.14 – MAPE over Winter (Oct'18 to Mar'19) on MODEL(exc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	4.31%	4.97%	7.15%	6.70%	5.95%	5.82%	11.02%	6.63%	5.11%	4.28%	4.58%	5.18%	8.70%	5.91%
02B (I&C)	6.62%	5.86%	6.35%	6.46%	6.51%	6.48%	7.94%	8.04%	5.70%	4.02%	4.37%	6.85%	7.73%	6.13%
03B (I&C)	5.78%	5.47%	5.96%	5.11%	6.51%	7.48%	8.47%	8.42%	5.53%	4.39%	4.25%	7.59%	10.96%	6.17%
04B (I&C)	4.35%	5.31%	4.94%	5.49%	4.25%	5.21%	9.14%	6.93%	4.77%	3.59%	3.73%	4.49%	6.92%	4.76%
05B (I&C)	3.63%	4.83%	4.52%	7.66%	5.16%	5.11%	10.90%	5.56%	3.62%	3.03%	3.45%	5.50%	5.56%	4.66%
06B (I&C)	4.75%	5.17%	4.60%	6.92%	4.62%	6.58%	19.50%	6.58%	6.23%	8.61%	5.94%	7.61%	5.58%	6.05%
07B (I&C)	6.09%	14.73%	9.45%	11.26%	4.51%	14.17%	n/a	15.22%	10.67%	13.01%	15.42%	15.74%	13.01%	11.44%
08B (I&C)	12.94%	17.67%	7.70%	14.40%	10.56%	11.59%	n/a	22.34%	11.10%	8.71%	12.38%	14.10%	19.99%	19.09%

Figure S12.3.15 – MAPE over Summer (Apr'19 to Sep'19) on MODEL(exc) Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	12.82%	11.69%	16.49%	16.62%	16.72%	18.21%	16.50%	11.39%	7.43%	8.63%	6.44%	8.29%	10.15%	12.13%
02B (I&C)	11.32%	7.45%	8.84%	10.98%	13.11%	11.06%	10.68%	16.55%	10.75%	7.25%	7.95%	9.02%	9.37%	10.15%
03B (I&C)	8.72%	6.78%	9.82%	7.52%	11.54%	13.11%	9.53%	16.99%	8.43%	6.42%	7.88%	9.11%	14.13%	9.43%
04B (I&C)	6.64%	7.12%	7.41%	6.31%	7.30%	8.30%	12.08%	8.99%	8.13%	6.48%	5.70%	7.02%	9.01%	7.09%
05B (I&C)	4.25%	5.52%	7.61%	8.91%	9.46%	8.88%	19.21%	9.68%	8.38%	8.91%	5.53%	6.07%	7.41%	7.20%
06B (I&C)	4.79%	15.41%	8.58%	6.65%	10.74%	14.71%	14.45%	10.57%	15.89%	11.35%	7.41%	8.44%	11.10%	9.68%
07B (I&C)	13.98%	25.62%	9.37%	16.87%	7.22%	28.99%	n/a	41.21%	28.47%	18.32%	20.74%	14.64%	8.88%	17.14%
08B (I&C)	9.39%	11.18%	10.90%	14.10%	11.29%	26.49%	n/a	33.72%	9.29%	9.15%	11.84%	27.20%	14.90%	16.21%

Figure S12.3.16 – MAPE over Full Year (Oct'18 to Sep'19) on RETRO Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	8.17%	8.39%	11.25%	10.56%	10.50%	10.98%	13.10%	8.93%	6.66%	6.46%	5.54%	6.12%	9.71%	8.69%
01B (I&C)	8.06%	14.80%	10.82%	13.77%	12.49%	9.58%	11.81%	10.37%	10.71%	15.63%	13.88%	14.41%	15.13%	12.05%
02B (Dom)	10.99%	18.35%	10.03%	11.82%	23.18%	13.94%	15.86%	12.47%	18.77%	21.01%	11.19%	14.18%	7.81%	14.81%
02B (I&C)	8.86%	6.45%	6.15%	7.24%	6.68%	7.32%	9.38%	7.19%	7.55%	5.26%	5.37%	5.37%	6.89%	6.87%
03B (I&C)	6.72%	5.57%	6.24%	6.65%	5.26%	5.76%	9.02%	6.96%	6.77%	5.17%	7.42%	5.54%	7.19%	6.37%
04B (I&C)	5.30%	5.84%	5.84%	6.34%	5.67%	6.41%	9.04%	6.55%	6.26%	4.79%	4.63%	5.64%	7.38%	5.71%
05B (I&C)	4.35%	5.05%	6.29%	8.95%	7.33%	7.21%	14.68%	6.55%	6.49%	5.43%	4.18%	5.98%	6.44%	6.02%
06B (I&C)	4.78%	11.17%	7.37%	6.57%	7.22%	9.76%	15.69%	7.82%	10.34%	11.72%	6.24%	8.19%	10.47%	8.00%
07B (I&C)	11.92%	19.07%	8.02%	14.17%	6.13%	21.10%	n/a	29.66%	18.53%	16.04%	17.38%	12.30%	10.30%	14.09%
08B (I&C)	9.19%	14.52%	9.33%	13.94%	10.97%	19.05%	n/a	26.51%	9.85%	8.47%	11.66%	24.98%	17.22%	17.52%

Figure S12.3.17 – MAPE over Winter (Oct'18 to Mar'19) on RETRO Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	4.21%	4.97%	7.05%	6.54%	5.67%	5.70%	11.18%	6.49%	4.99%	4.28%	4.54%	5.13%	8.55%	5.81%
01B (I&C)	3.85%	6.05%	6.05%	5.66%	5.23%	4.66%	10.18%	6.18%	5.88%	6.87%	5.77%	7.22%	8.56%	5.82%
02B (Dom)	6.66%	14.63%	6.77%	8.33%	7.72%	9.22%	11.68%	9.40%	5.86%	8.39%	8.62%	12.74%	4.00%	8.76%
02B (I&C)	6.39%	5.47%	4.80%	5.52%	4.59%	5.29%	7.47%	6.07%	5.46%	3.25%	3.72%	4.92%	6.57%	5.17%
03B (I&C)	5.18%	3.96%	4.56%	4.52%	3.88%	4.68%	8.38%	6.07%	4.44%	3.35%	3.98%	4.97%	7.26%	4.76%
04B (I&C)	4.10%	4.71%	4.45%	4.58%	3.71%	4.55%	7.30%	5.21%	4.46%	3.08%	3.64%	4.01%	6.34%	4.27%
05B (I&C)	3.54%	3.85%	4.38%	6.97%	4.24%	4.42%	10.10%	4.01%	3.62%	2.85%	3.54%	5.67%	4.35%	4.27%
06B (I&C)	4.41%	5.61%	4.90%	6.43%	4.35%	5.54%	18.16%	5.31%	5.17%	8.00%	5.15%	7.37%	5.86%	5.66%
07B (I&C)	6.49%	13.40%	7.78%	11.55%	4.30%	13.67%	n/a	16.13%	10.02%	12.83%	13.98%	13.30%	12.33%	10.85%
08B (I&C)	10.75%	17.64%	7.69%	13.89%	10.14%	11.75%	n/a	20.99%	10.91%	7.89%	11.76%	14.94%	19.27%	18.67%

Figure S12.3.18 – MAPE over Summer (Apr'19 to Sep'19) on RETRO Basis

EUC	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	Total Weighted
01B (Dom)	12.10%	11.80%	15.43%	14.56%	15.31%	16.23%	15.01%	11.37%	8.32%	8.62%	6.54%	7.10%	10.87%	11.55%
01B (I&C)	12.25%	23.51%	15.56%	21.84%	19.72%	14.46%	13.44%	14.53%	15.53%	24.34%	21.96%	21.56%	21.66%	18.24%
02B (Dom)	15.30%	22.06%	13.27%	15.29%	38.56%	18.64%	20.01%	15.53%	31.62%	33.57%	13.76%	15.63%	11.61%	20.83%
02B (I&C)	11.31%	7.43%	7.49%	8.96%	8.75%	9.34%	11.27%	8.29%	9.62%	7.27%	7.00%	5.81%	7.20%	8.56%
03B (I&C)	8.25%	7.17%	7.92%	8.77%	6.64%	6.83%	9.65%	7.85%	9.10%	6.97%	10.84%	6.11%	7.13%	7.97%
04B (I&C)	6.51%	6.96%	7.23%	8.08%	7.63%	8.25%	10.77%	7.87%	8.05%	6.48%	5.63%	7.27%	8.41%	7.15%
05B (I&C)	5.16%	6.24%	8.19%	10.92%	10.39%	9.98%	19.23%	9.07%	9.35%	8.00%	4.81%	6.30%	8.53%	7.75%
06B (I&C)	5.15%	16.70%	9.83%	6.71%	10.07%	13.96%	13.24%	10.32%	15.48%	15.42%	7.33%	9.01%	15.05%	10.33%
07B (I&C)	17.31%	24.72%	8.26%	16.77%	7.95%	28.50%	n/a	43.11%	26.98%	19.24%	20.77%	11.31%	8.30%	17.31%
08B (I&C)	7.64%	11.41%	10.95%	14.00%	11.80%	26.31%	n/a	32.00%	8.80%	9.05%	11.56%	34.96%	15.17%	16.37%

Figure S12.3.19 – MAPE Summary (Weighted average across LDZs) on MODEL(inc) Basis

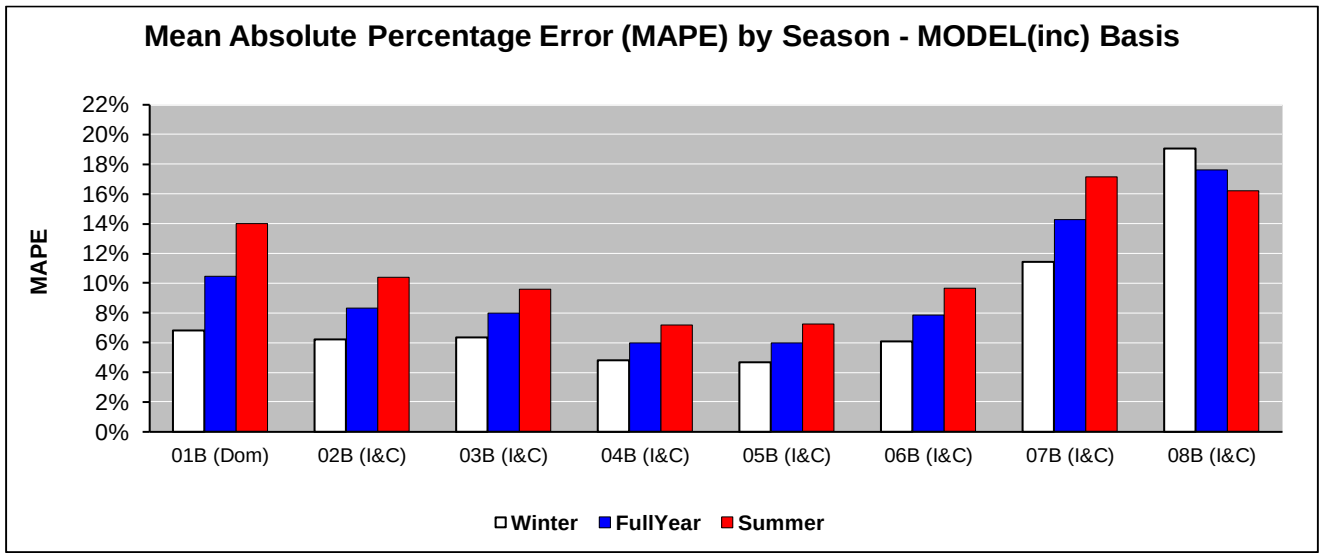


Figure S12.3.20 – MAPE Summary (Weighted average across LDZs) on MODEL(exc) Basis

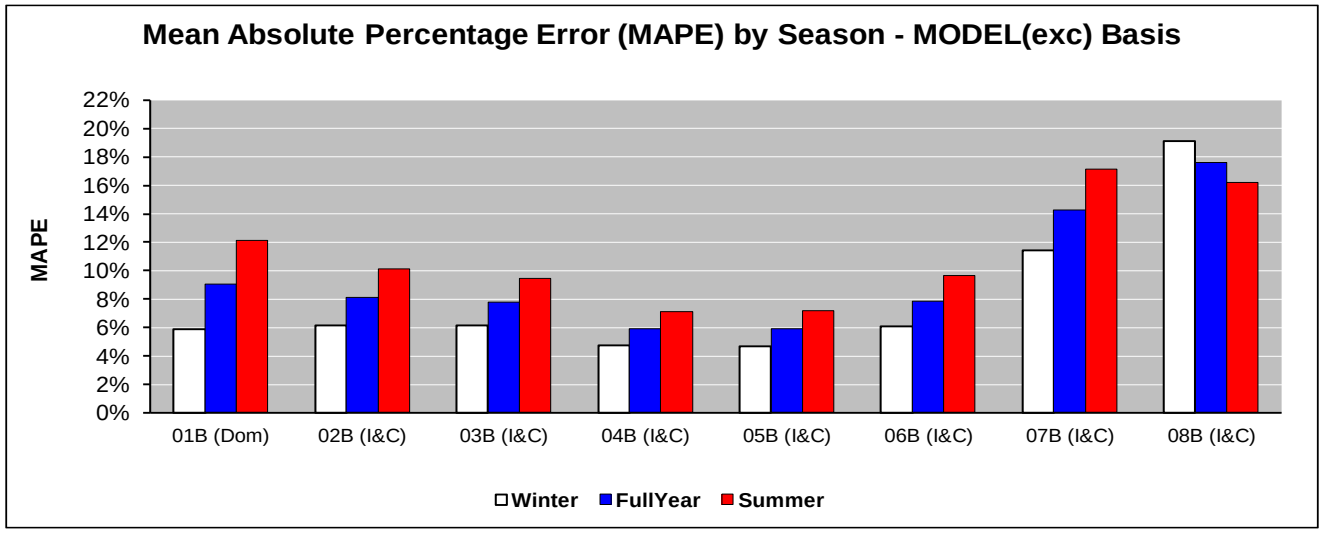


Figure S12.3.21 – MAPE Summary (Weighted average across LDZs) on RETRO Basis

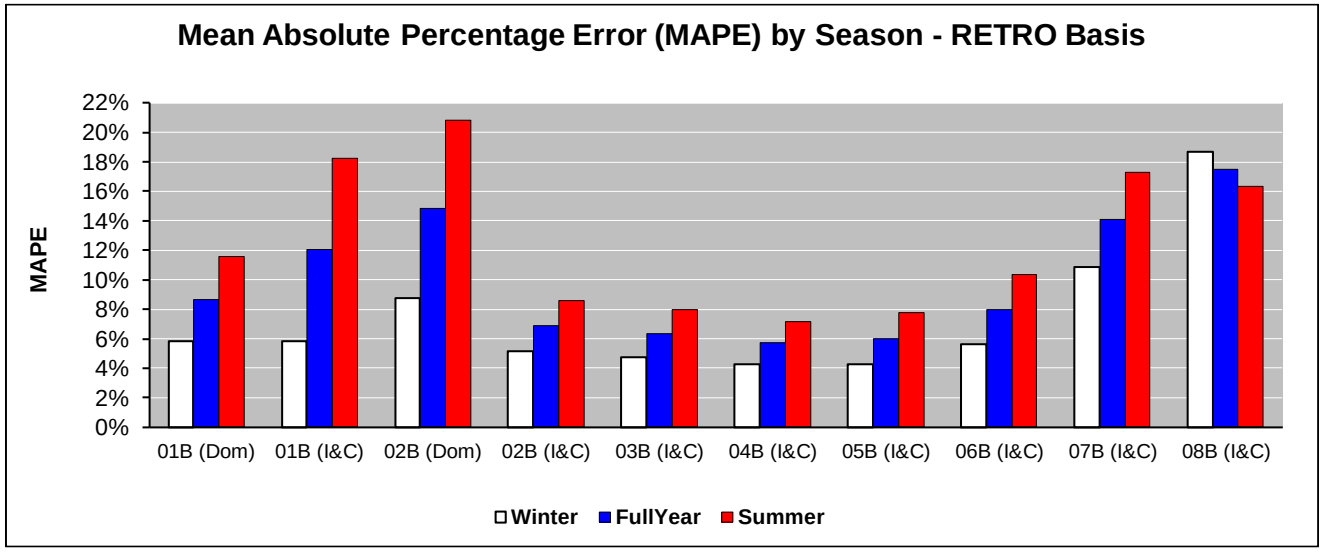


Figure S12.3.22 – Monthly Actual and Allocated Demands for 01B (across all LDZs)

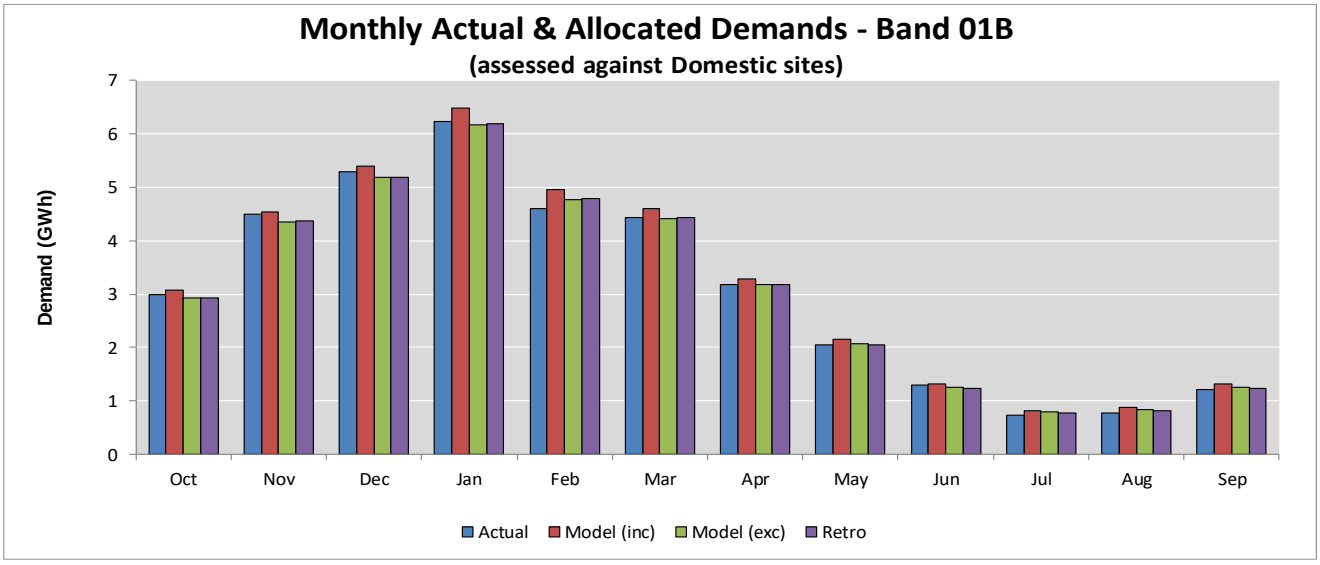


Figure S12.3.23 – Monthly Actual and Allocated Demands for 02B (across all LDZs)

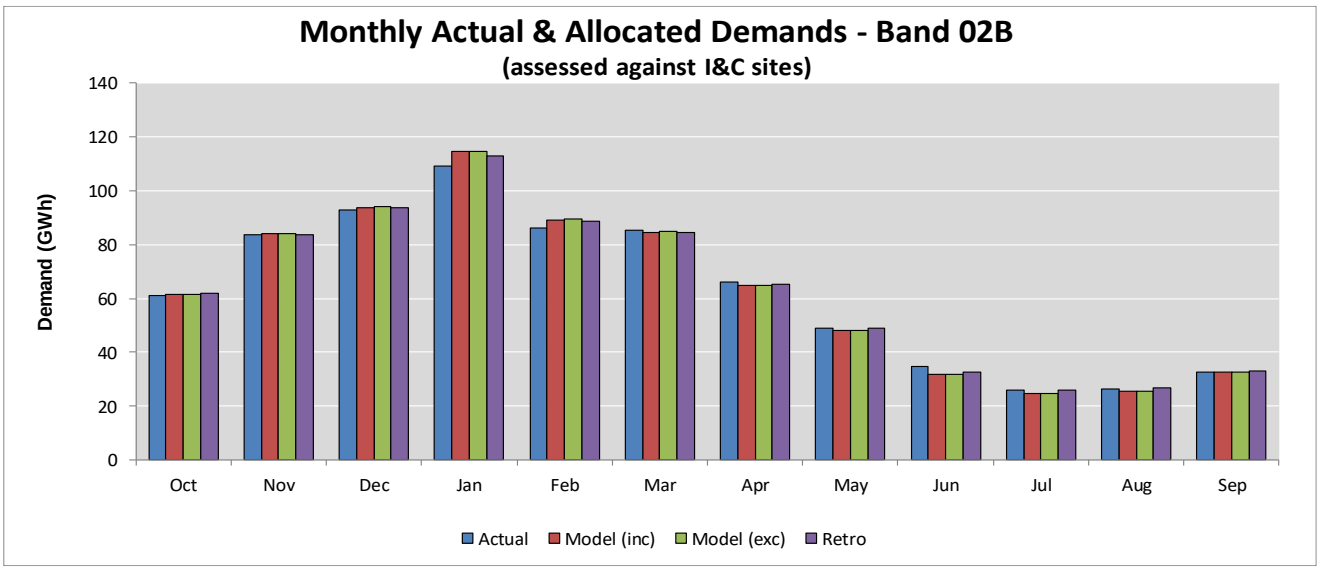


Figure S12.3.24 – Monthly Actual and Allocated Demands for 03B (across all LDZs)

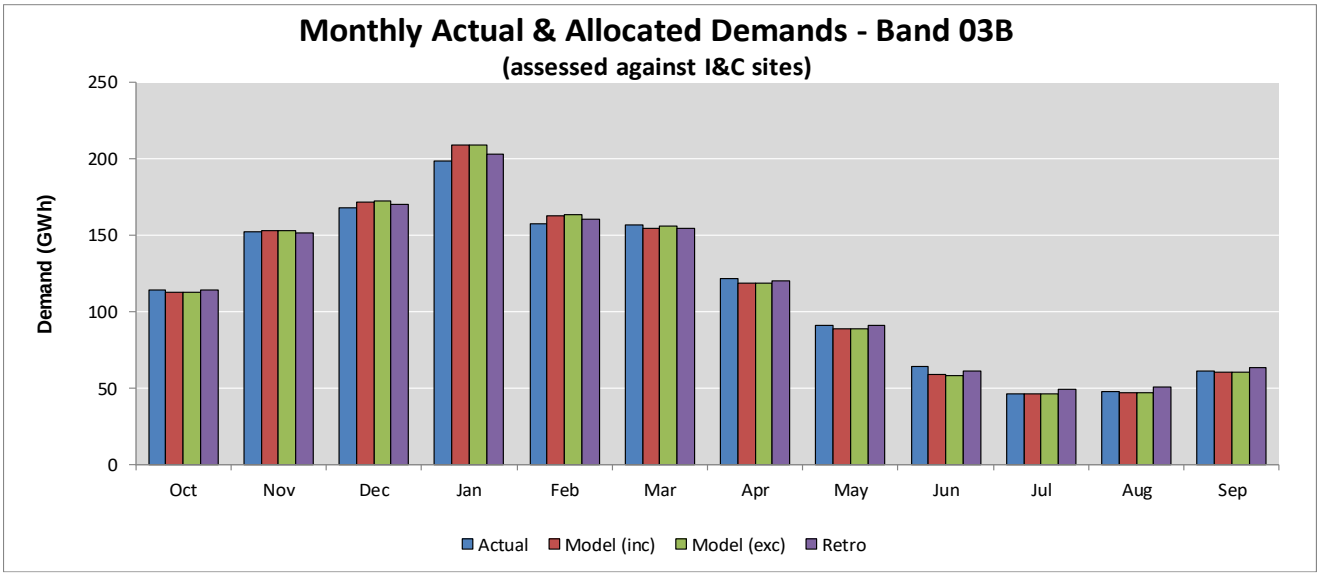


Figure S12.3.25 – Monthly Actual and Allocated Demands for 04B (across all LDZs)

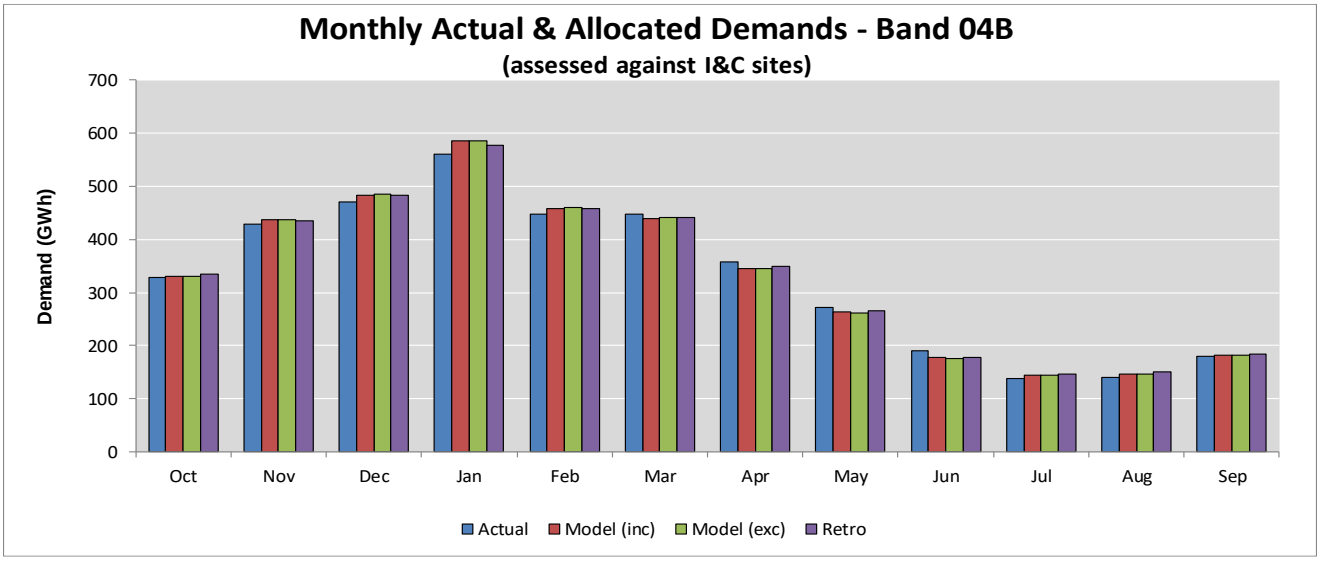


Figure S12.3.26– Monthly Actual and Allocated Demands for 05B (across all LDZs)

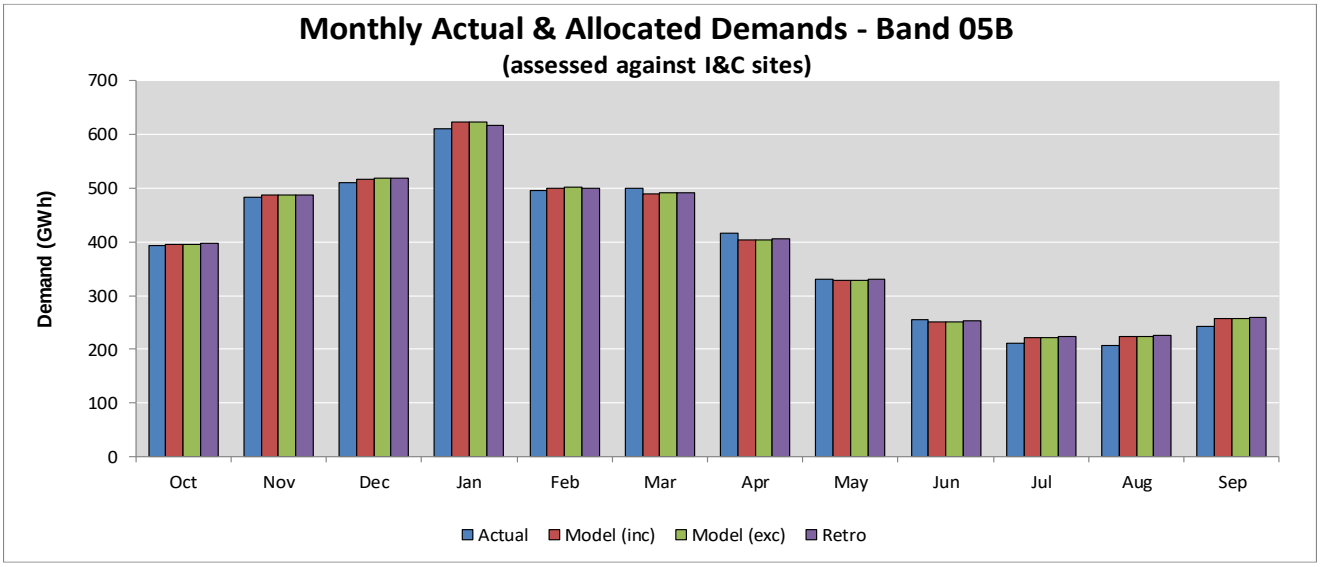


Figure S12.3.27 – Monthly Actual and Allocated Demands for 06B (across all LDZs)

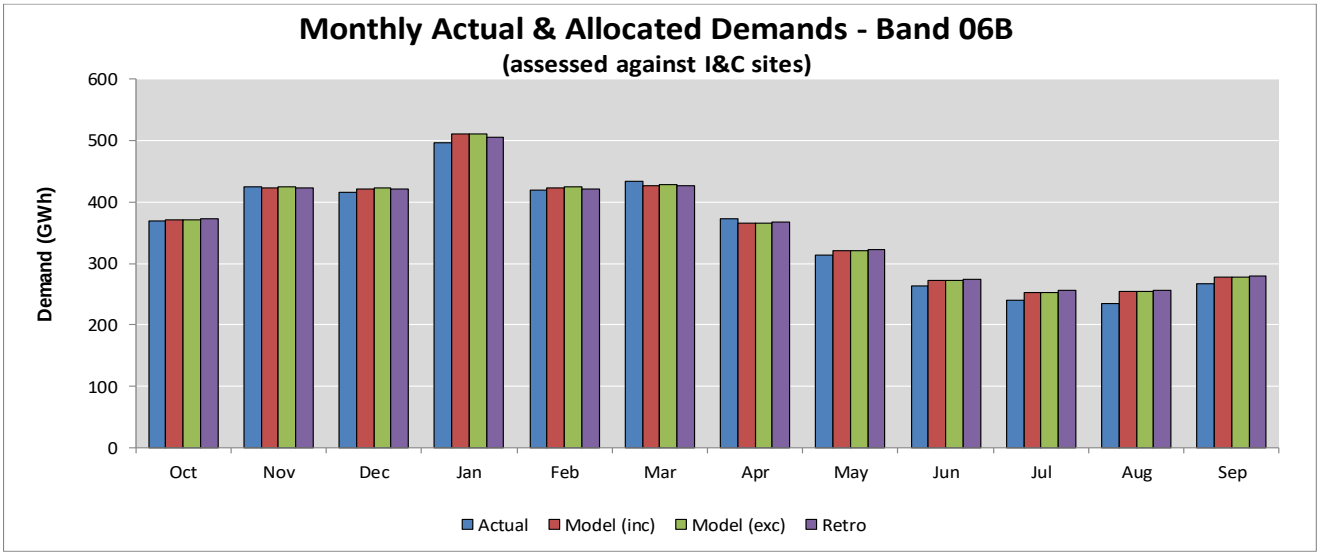


Figure S12.3.28 – Monthly Actual and Allocated Demands for 07B (across all LDZs)

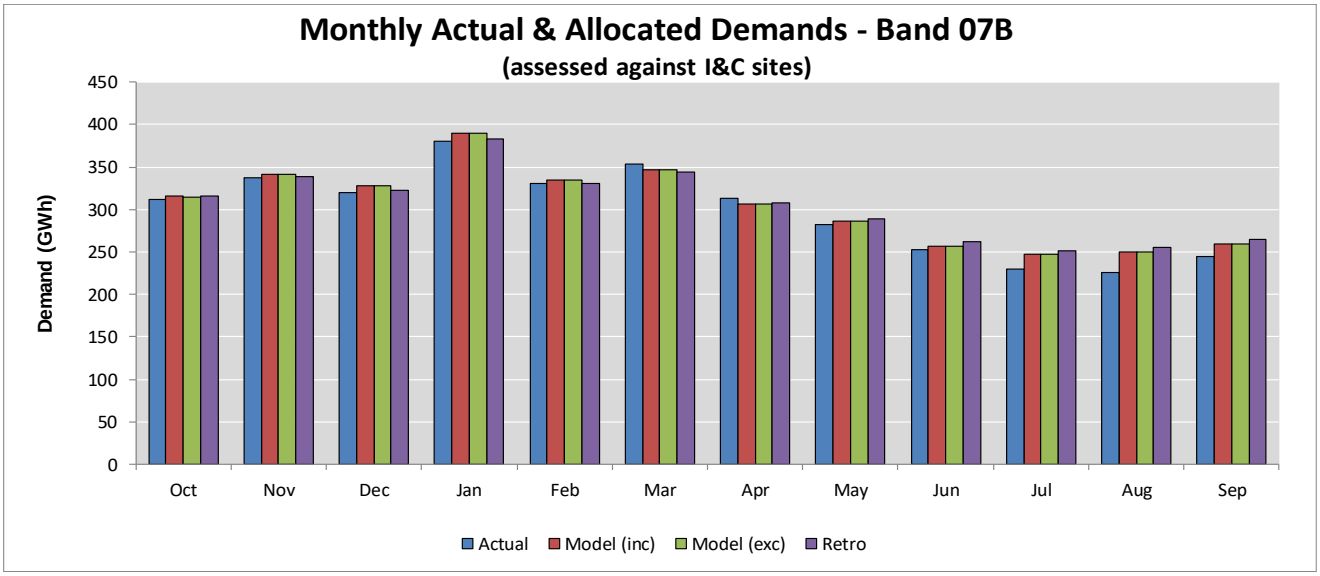


Figure S12.3.29 – Monthly Actual and Allocated Demands for 08B (across all LDZs)

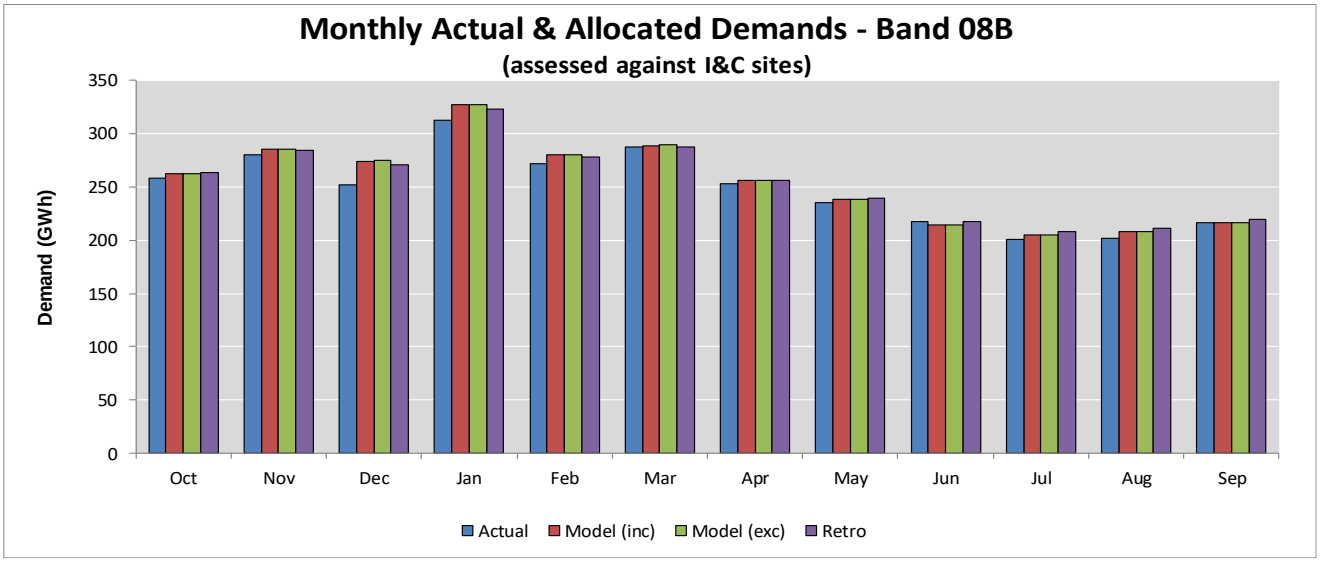


Figure S12.3.30 – Daily Actual and Allocated Demands for 01B (across all LDZs) for I&C Sites

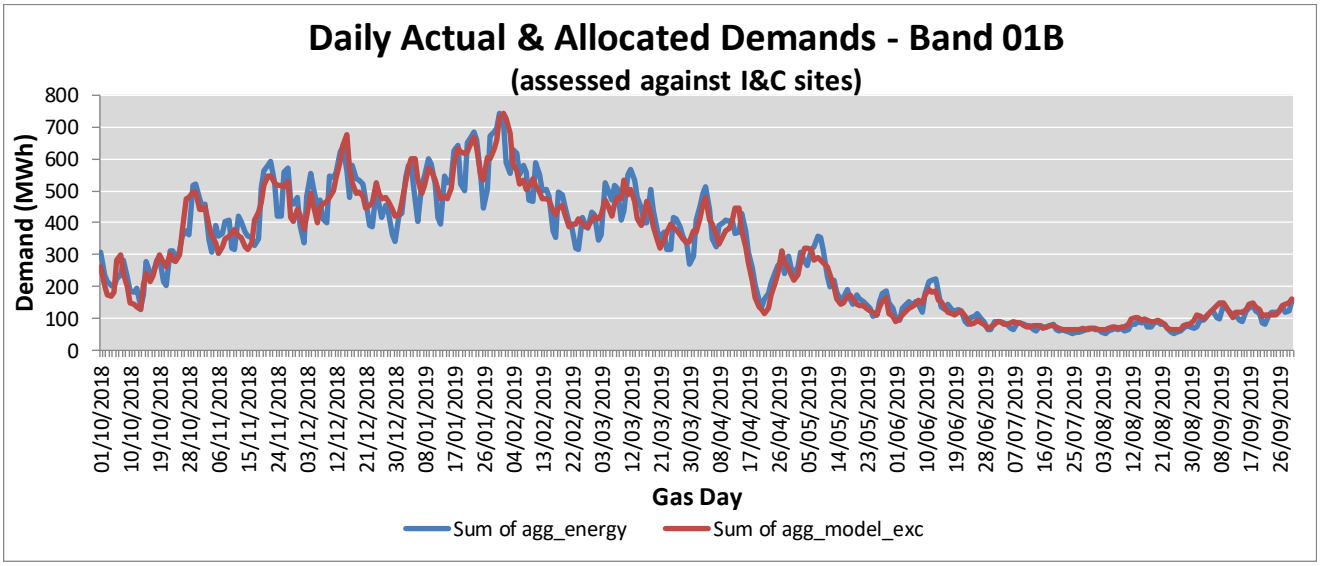


Figure S12.3.31 – Daily Actual and Allocated Demands for 01B (across all LDZs) for I&C Sites

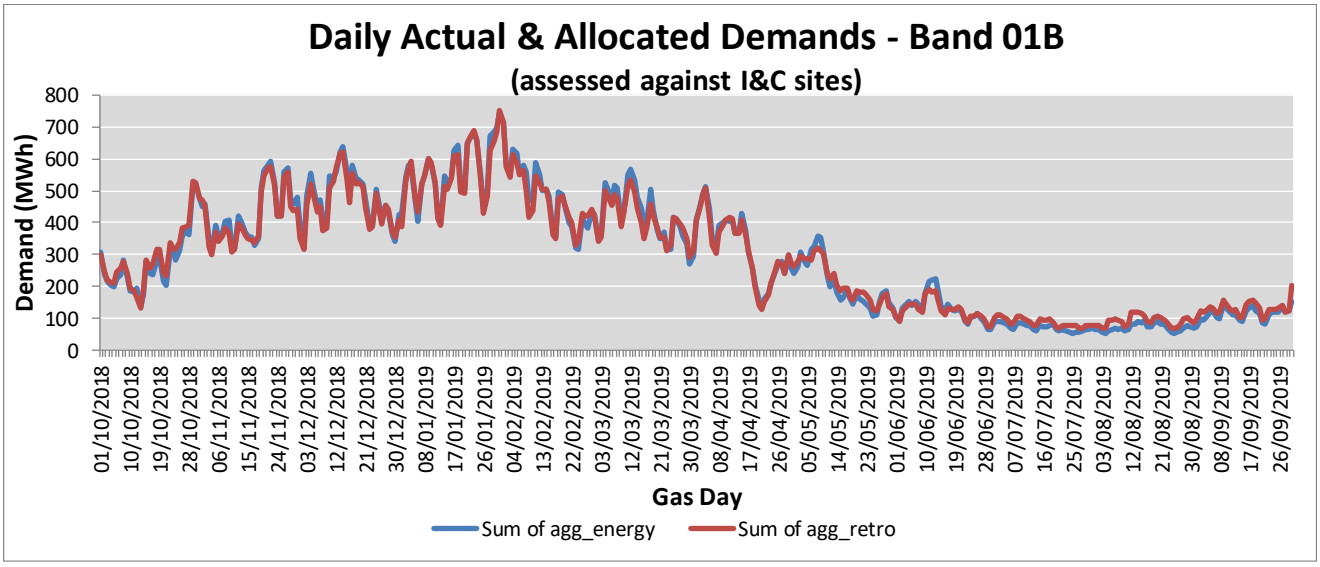


Figure S12.3.32 – Daily Actual and Allocated Demands for 02B (across all LDZs) for Domestic Sites

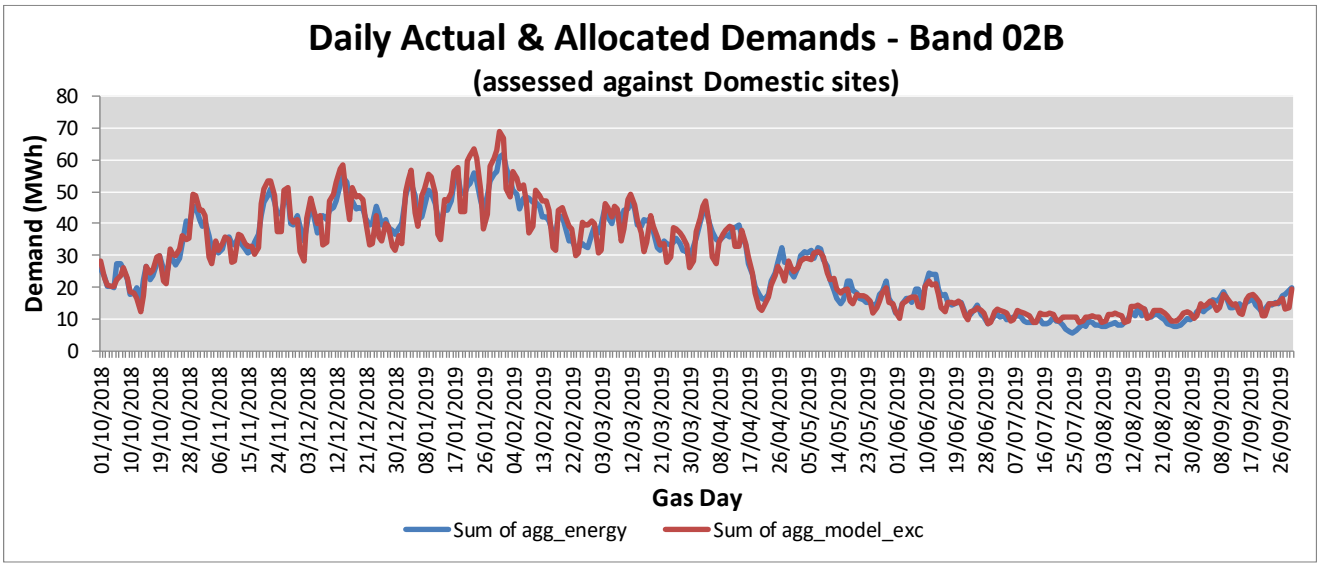


Figure S12.3.33 – Daily Actual and Allocated Demands for 02B (across all LDZs) for Domestic Sites

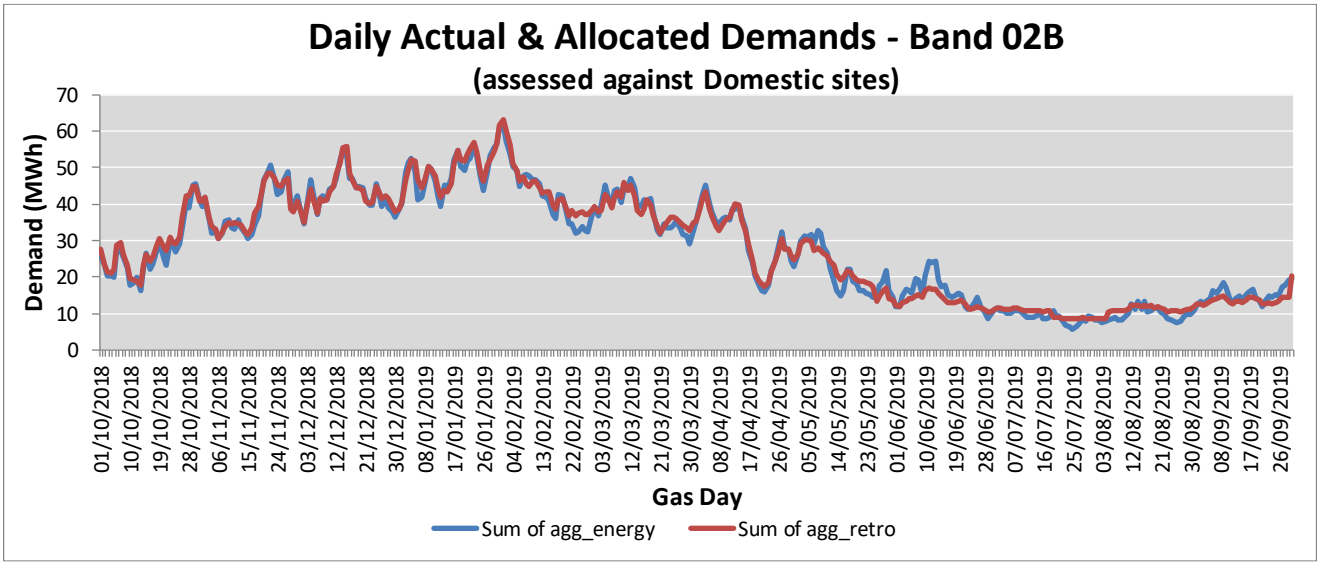


Figure S12.3.34 – MAPE Summary by EUC (Current versus Previous Year) – Retro Basis

Profiles	2018/19 Profiles		2019/20 Profiles		
Analysis	RETRO using 2017/18 Data		RETRO using 2018/19 Data		
EUC	Sample Count	MAPE (Full Year)	Sample Count	MAPE (Full Year)	vs Previous Year
01B (Dom)	2,713	10.28%	2,450	8.69%	-1.59%
01B (I&C)	2,781	16.67%	3,267	12.05%	-4.62%
02B (Dom)	23	33.47%	102	14.81%	-18.66%
02B (I&C)	4,916	10.94%	4,731	6.87%	-4.07%
03B (I&C)	3,387	10.49%	3,040	6.37%	-4.12%
04B (I&C)	3,211	6.96%	3,147	5.71%	-1.25%
05B (I&C)	1,347	6.59%	1,404	6.02%	-0.57%
06B (I&C)	498	7.61%	487	8.00%	0.38%
07B (I&C)	168	14.74%	184	14.09%	-0.65%
08B (I&C)	75	12.84%	78	17.52%	4.68%