Impact of the change in Weather Correction Factor on Demand Estimation

Weather Correction Factor

Post Nexus the definition of WCF was amended from the use of non-daily metered and seasonal normal demands to CWV and seasonal normal CWV. This required a change in the DAFs. The ALPs were unchanged.

WCF definitions

Pre Nexus WCF on day t is given by,

$$WCF_t = \frac{NDM_t - SN\ Dem_t}{SN\ Dem_t}, \hspace{3cm} [\ 1\ ]$$

Where NDM is Non Daily Metered Demands for the LDZ for the day; and SN Dem is the Seasonal Normal Demands for the LDZ for the day.

Post Nexus WCF on day t is given by,

$$WCF_t = CWV_t - SNCWV_t \hspace{3cm} [\ 2\ ]$$

Where CWV is Composite Weather Variable for the LDZ for the day; and SNCWV is the Seasonal Normal value of the Composite Weather Variable for the LDZ for the day.

Weather Correction Factor Impacts

There is some equivalence between the two WCF definitions. Where demand is at seasonal normal, demand estimation gives the same result. At seasonal normal in both definitions WCF = 0 therefore we can simplify to:

$$NDM = \frac{AQ}{365} \times ALP \times (1 + WCF \times DAF) \times SF \hspace{2cm} [\ 3\ ]$$

Now let's consider when demand/weather begins to differ from seasonal normal. We can calculate pre and post nexus demands using *[4]* and *[5]*.

Pre Nexus Demand Estimation

$$NDM = \frac{AQ}{365} \times ALP \times (1 + WCF \times DAF) \times SF \hspace{2cm} [\ 4\ ]$$

Where WCF is given by *[1]* and

$$DAF_t = \frac{WSENS_t/SND_t (\text{for EUC})}{WSENS_t/SND_t (\text{for aggregate NDM in LDZ})}.$$

Post Nexus Demand Estimation

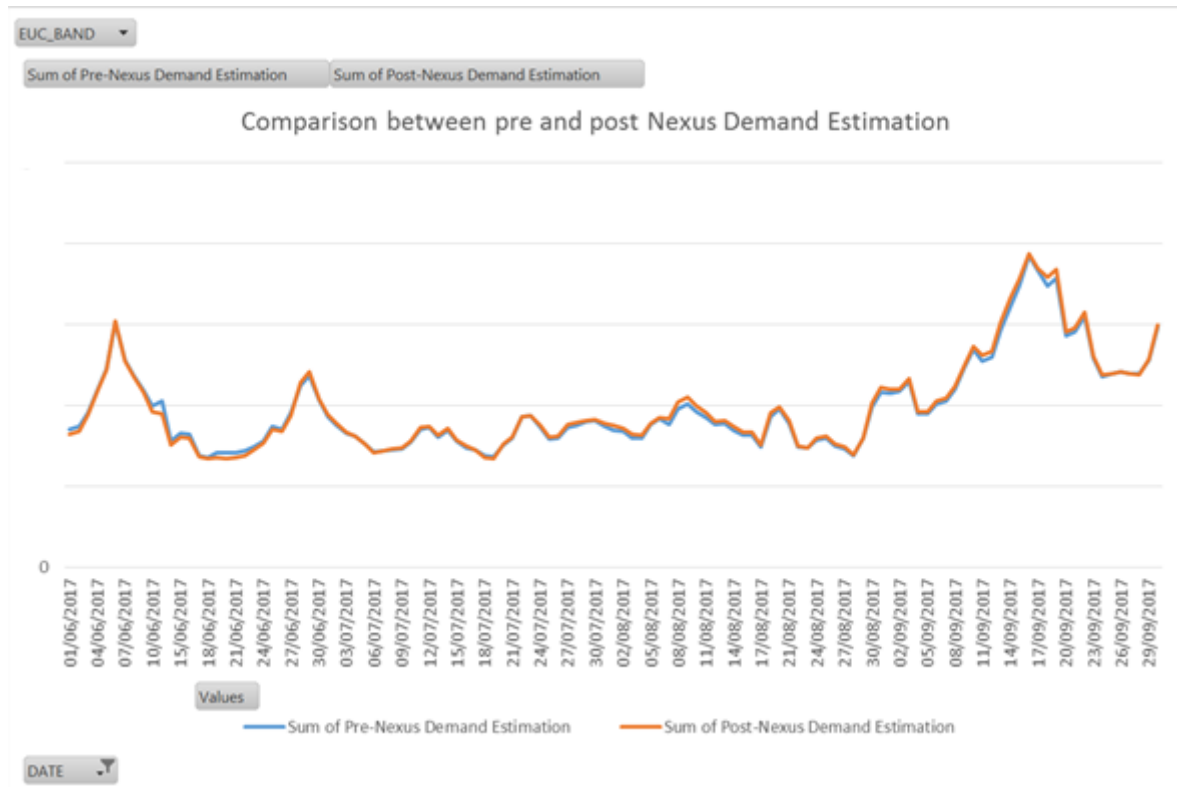$$NDM = \frac{AQ}{365} \times ALP \times (1 + WCF \times DAF) + UIG \hspace{2cm} [\ 5\ ]$$

Where WCF is given by *[2]* and

$$DAF_t = \frac{WSENS_t}{SND_t} \leq 0 \text{ (for EUC)}.$$

Impacts from the change in WCF definition

Demand has been calculated on pre *[4]* and post nexus *[5]* definitions for 429 EUC bands across the British Gas portfolio which is predominantly EUC 1.

Demand estimation under both definitions is similar for period assessed – June 2017 to September 2017.

Observations

- Post Nexus demand has been 0.7% higher for the full period assess. Given positive UIG, this would have been helpful.

- During the colder period of weather in mid-September the post nexus demand response has been higher, which again would have been slightly helpful in removing the error in demand estimation and lowering value of UIG.

- There was an expectation that the pre-nexus definition of WCF (use of actual demands) would offer a greater correction to NDM allocation (given the use of actual demands) compared to actual CWV. The results show a greater response from post-nexus WCF, although there is limited data to offer this as a general conclusion.

- We find that pre and post nexus WCF definitions have been a good proxy for each other. Figure 1 compares the two definitions, here for LDZ EA and the linear fit between the two show good agreement:

  o Where CWV is below of above seasonal normal, under both definitions, the WCF is directionally correct.
  o One is a very good proxy for the other, which follows from the earlier results that both definitions are comparable.

Figure 1