Xoserve

Demand Estimation Technical Work Group
Review of draft 2018/19 NDM Algorithms
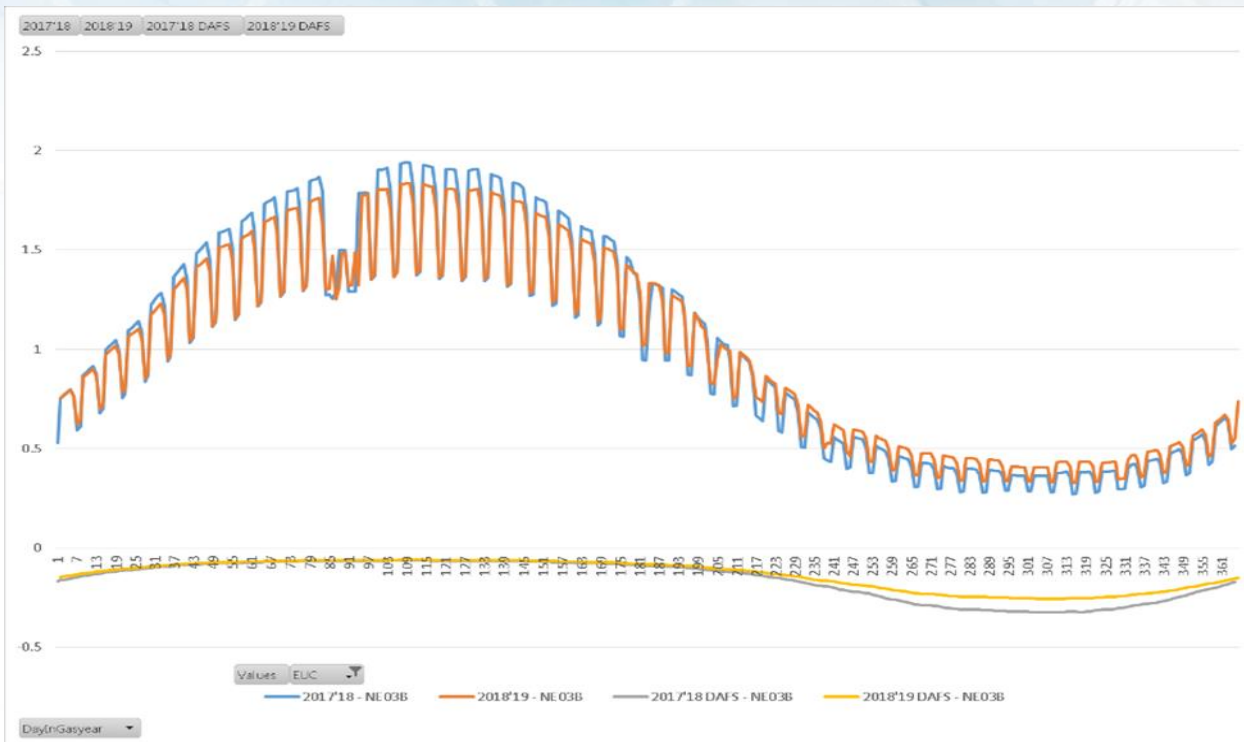
9th July 2018

Summary of TWG responses to proposed Algorithms and Xoserve clarifications
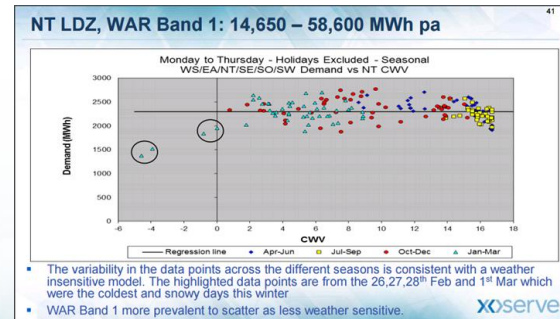
TWG Responses / Comments on Proposals

- Observations received from British Gas considered here

British Gas Observation – ALP & DAF: NE:E03B

- **ALPs:** NE03B, left, is typical of the lower winter ALPs for EUC bands 2+, much lower seasonality (lower winter, higher summer demand) – is this the result of additional samples? Or has the impact of the cold weather shutdowns impacted these ALPS, e.g. from DESC - 15th May we reviewed the lower demands during cold CWV for large NDM, is this behaviour reflected in EUC bands 2-3 - don't recall us reviewing that.

- **DAFs:** EUC 03B across the LDZs has lower summer DAFs, e.g. NE03B:

- The variability in the data points across the different seasons is consistent with a weather insensitive model. The highlighted data points are from the 26,27,28th Feb and 1st Mar which were the coldest and snowy days this winter.
- WAR Band 1 more prevalent to scatter as less weather sensitive.

It's important that we are able to see if the lower demands during the cold weather upturn is resulting in these lower ALPs. How significant is the impact given it is 4 days. Thoughts so far have been it shouldn't have an impact, so it be great to confirm this.

British Gas – ALP/DAF: NE:E03B- Response 1 of 3

- Xoserve observed that a number of the smoothed profiles this year have become 'flatter' than last year's equivalent model i.e. less weather sensitive – (less allocation in winter and more in summer) - the model for NE03B is an example of this

- The table below shows the CWV intercepts (a simple measure of weather sensitivity) for the last 2 years smoothed model . Note: Higher intercept = less weather sensitive

Analysis Year	2014/15	2015/16	2016/17	2017/18	Smoothed
2017	18.4	18.9	18.5	-	18.6
2018	-	18.9	18.5	21.1	19.4

- You can see that the latest year is less weather sensitive and this has replaced the oldest year which was the most weather sensitive. This change has contributed to the smoothed model becoming flatter

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British Gas – ALP/DAF: NE:E03B- Response 2 of 3

Monday to Thursday - Holidays Excluded - Seasonal
NE Demand vs NE CWV
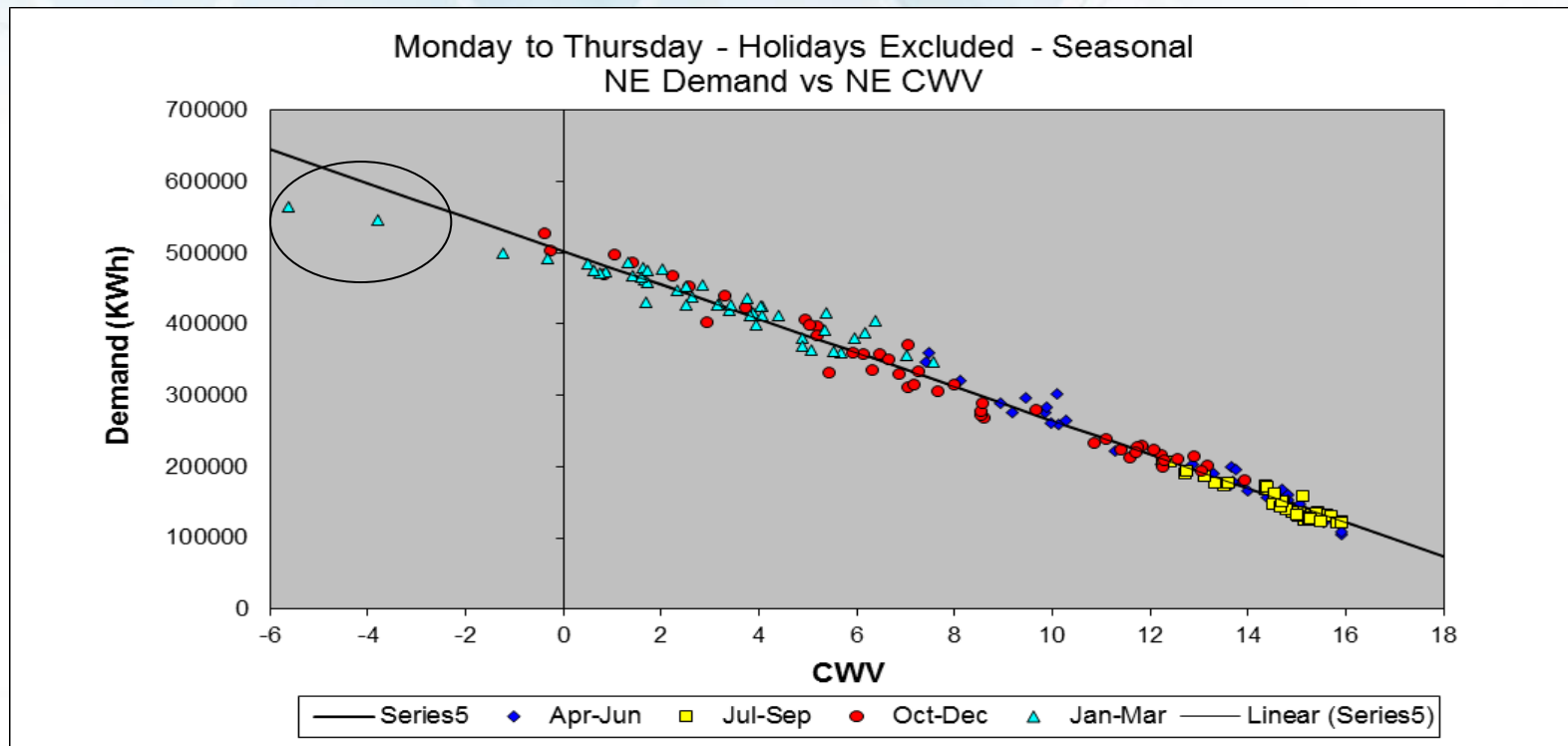
- Chart above shows the data for 2017/18 for NE 03B – based on 194 sample points – CWV intercept of 21.1
- Removal of 2 outlier 'snowy' days (28/2 and 1/3) would change intercept to 20.9
- Suggests weather sensitivity change seen this year is not down to these days

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British Gas – ALP/DAF: NE:E03B- Response 3 of 3

- Below shows the sample numbers used within each individual year model and how the additional sample data provided by third parties has contributed

Analysis Year	Data Source	2014/15	2015/16	2016/17	2017/18
2017	Transporter	78	109	126	-
2017	Third Party	-	14	6	-
2017	Total	78	123	132	-
2018	Transporter	-	109	126	88
2018	Third Party	-	14	6	106
2018	Total	-	123	132	194

- The table above shows how potentially the change in the composition of the sample this has contributed to the change in weather sensitivity of this model

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British Gas Observation – ALP & DAF: EA:E01B
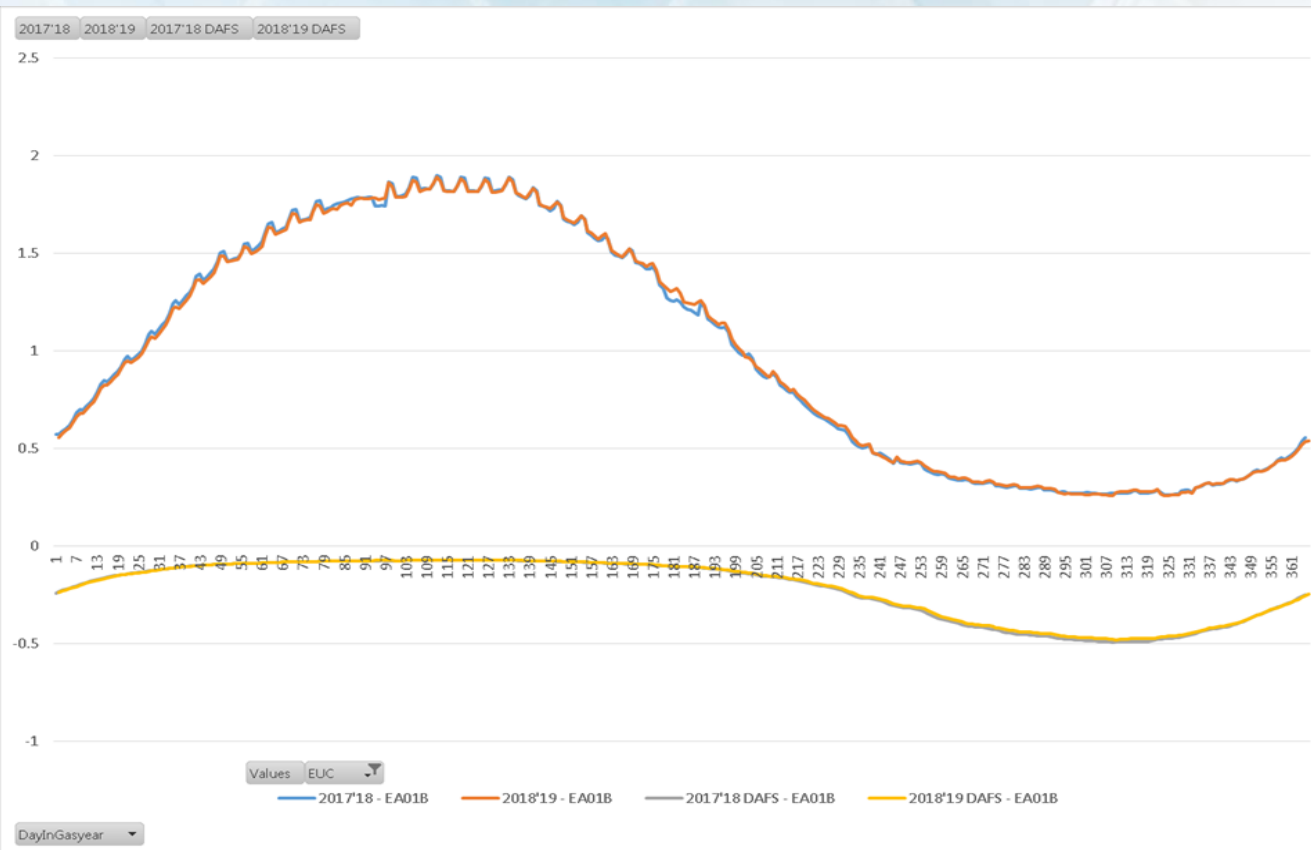
- **EUC band 1B ALPS:** in general slightly less seasonality – slightly less demand in winter, more in summer, it would imply that the impact of the cold Feb/March 2018 wasn't significant enough (higher winter demand) to lead to a significant change in the ALPS, compared to the previous gas year. Is this puzzling given it was the coldest Feb/Mar for many years.

- I can see the removal of lower New Year's "trough" for several EUC 1B profiles, the impact from holiday codes hasn't affected the profiles this year. Does a future potential impact remain?
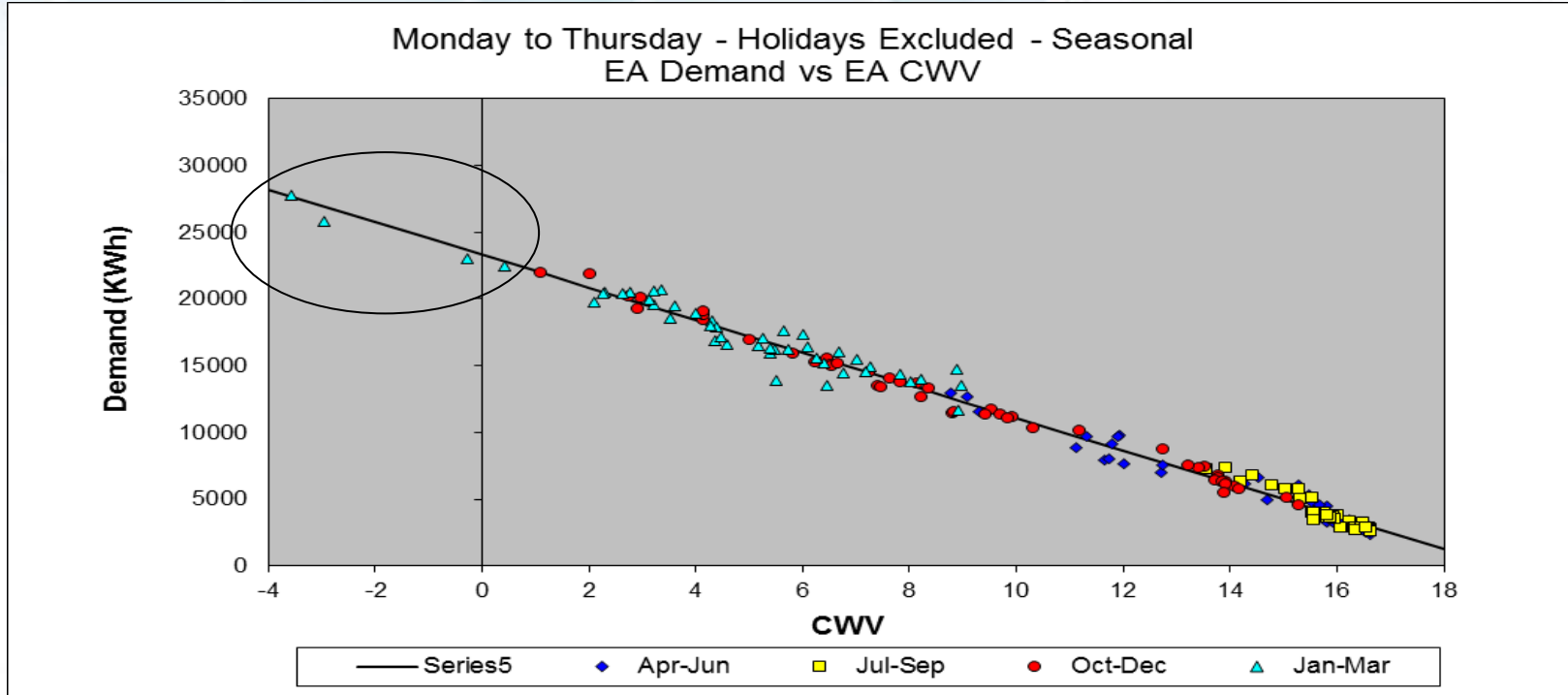
British Gas – ALP/DAF: EA:E01B- Response 1 of 3

- The table below shows the CWV intercepts (a simple measure of weather sensitivity) for the last 2 years smoothed model . Note: Higher intercept = less weather sensitive

Analysis Year	2014/15	2015/16	2016/17	2017/18	Smoothed
2017	18.5	18.5	18.4	-	18.5
2018	-	18.5	18.4	18.7	18.5

- You can see that the latest year is slightly less weather sensitive

- This has resulted in the smoothed model becoming marginally flatter
  - 2018 intercepts at 2 dcps is 18.55
  - 2017 intercept at 2 dcps was 18.49

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British Gas – ALP/DAF: EA:E01B- Response 2 of 3

**Monday to Thursday - Holidays Excluded - Seasonal
EA Demand vs EA CWV**

- Chart above shows the data for 2017/18 for EA 01B where there is a good fit to the colder weather
- Assuming the smoothed models are a good representation of weather sensitivity i.e. line of best fit is accurate then no reason why years where there are instances of colder weather, such as 17/18, that this should change the sensitivity levels and make the profile peakier

British Gas – ALP/DAF: EA:E01B- Response 3 of 3

- The table below shows the Christmas Holiday code factors for EA:E01B for the last 2 analysis years

Analysis Year	Holiday Code 1	Holiday Code 2	Holiday Code 3	Holiday Code 4	Holiday Code 5
2017	0.995	0.997	0.997	1.000	0.969
2018	0.982	0.997	0.997	0.992	0.991

Holiday Code 1: 25th December
Holiday Code 2: 26th Dec, 1st Jan and any remaining bank holidays (except second Scotland New Yea bank holiday) and any other Saturdays and Sundays
Holiday Code 3: Any remaining Mondays to Fridays between 24th December and day before second Scotland New Year bank holiday inclusive
Holiday Code 4: Remaining days before 24th December
Holiday Code 5: Remaining days (will always include second Scotland New Year bank holiday)

- The 3% reduction observed for Holiday Code 5 in last years model contributed to the "trough" effect seen last year during new year period. This year the effect was 1% and covered 1 less day

- DESC's decision to introduce holiday codes for 01B was a marginal call as analysis was not overwhelming, but did suggest a slight improvement. Therefore difficult to predict future demand behaviours ?

- Review of Holiday code rules is on the current Adhoc Work plan, if this is prioritised by DESC later this month, maybe this could encompass a review of whether there has been a benefit in excluding holidays for the Domestic 01B model ?

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British Gas Observation – Prepayment profiles for 01B

- EM has greatest seasonality, SC - lowest.

- WS, SW, SO – Christmas drop in red? 21/12/2018. Rest of LDZs smaller drop.

# British Gas – Prepayment Profiles Response 1 of 2

- The third party data received only contained weekly readings. The weekly consumption was profiled over the days in between using the applicable 01B WAALP (i.e. standard domestic profile). Therefore daily characteristics that vary across LDZs are difficult to speculate on as they are not real values

- The weekly reads have at least enabled the difference in weather sensitivity 'levels' between domestic credit and domestic prepayment customers to be captured

- The 'drop' on 21st December 2018 is the first day of the Christmas holiday period and has a holiday code of 4. The 2018/19 holiday factors for Holiday Code 4 are shown below:

| Analysis Year	SC	NO	NW/WN	NE	EM	WM	WS	EA	NT	SE	SO	SW
2018	1	0.937	1	0.953	0.995	1	0.877	0.962	0.948	0.997	0.861	0.907

- In the analysis data (April 17 to Mar 18) there was only one 'holiday code 4 day' to 'learn' from as there is only 12 months of history for this data stream so holiday periods are particularly susceptible to anomalies

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British Gas – Prepayment Profiles Response 2 of 2

- Below is an example of the data for LDZ SO for the analysis period. The red data point relates to holiday code 4 – 22nd December 2017

Scatter Plot - All Days LDZ SO - PPM. Red data point - Hol Code 4
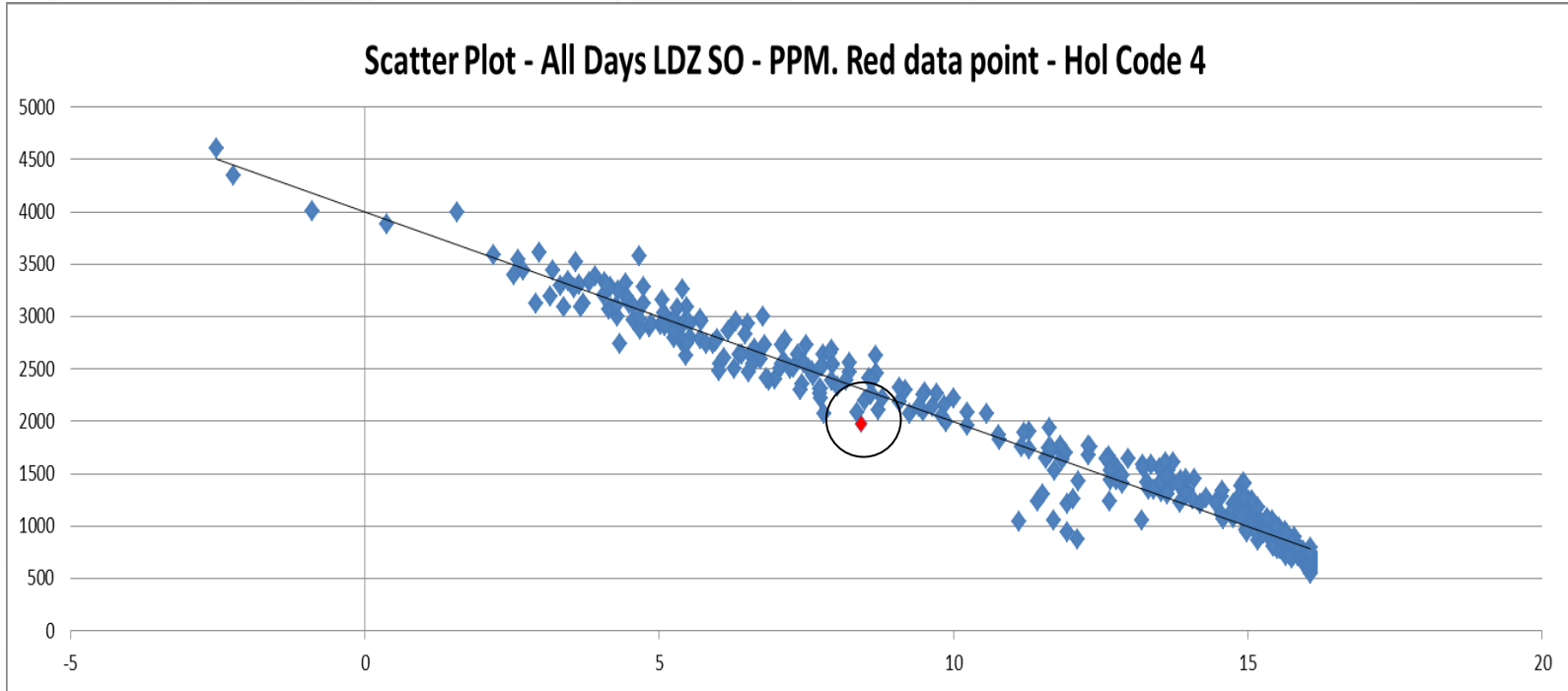
British Gas Observation – 01B Profiles
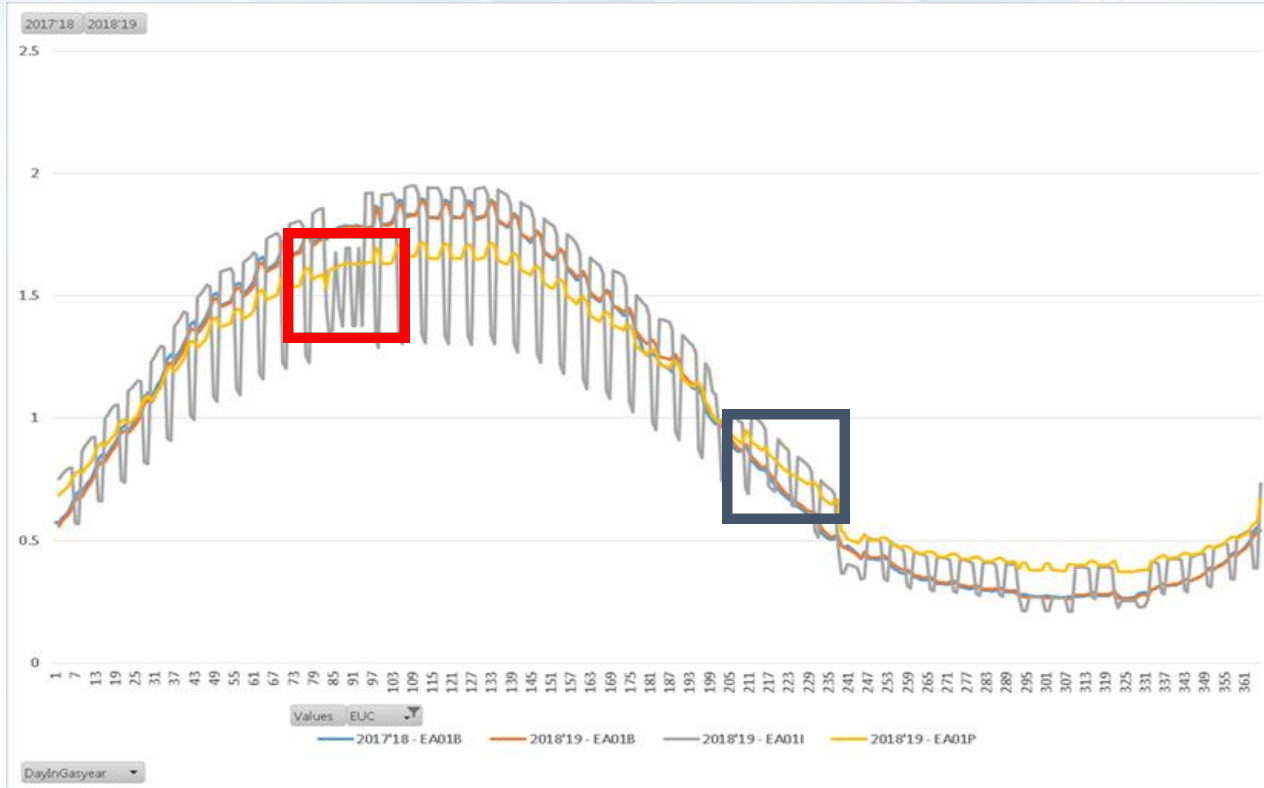
- EA01I – new non-domestic profile
- Holiday code impacts for Christmas – see red box
- Higher levels of weekend demands – see blue box
- Prepayment profiles (in yellow), less seasonality (as expected) vs credit (EUC1B).

- Xoserve Response:
- Good example of clear distinct profiles across the 0-73.2 MWh AQ range

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British Gas General Comments

- ALPs are not moving directionally in the right direction for UIG. Either this confirms the accuracy of demand estimation or the sample still remains unrepresentative
  - Xoserve Response: Agree that the new profiles for 02B and above are likely to allocate less demand to the NDM sites in Winter and more in the Summer (see Rec analysis results for 16/17 to show this may be beneficial ?). It would be good to receive even more sample data so that we can select sites to train model and then other sites to test the model to test whether it is representative ?

- Prepayment profiles make sense, less seasonality than credit
  - Xoserve Response: Good to hear they are in line with what you would expect / have observed

- DAFs have less summer weather response for 3B across the LDZs
  - Xoserve Response: We have also noticed that a large number of the ALPs for 02B and above are 'flatter' than last year i.e. less weather sensitive – (less allocation in winter and more in summer)

- EUC band 1 Non-domestic profile make sense, represents business profile and greater holiday effects
  - Xoserve Response: Good to hear it is in line with what you would expect / have observed

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