

Action 0201: “Xserve (MPe) to repeat the analysis to illustrate the impact of a) removal of sample site data and b) applying a weighting factor using population percentages. The outcome of the analysis to be sent to DESC members for review and to seek agreement on which method to adopt.”

As discussed at the 11th February DESC meeting, further analysis has been carried out utilising the most recent data collection, used for algorithm performance strand 3, which included additional sample sites from shippers.

Band 1: Population and Sample (Autumn'18) composition

Table A represents the current composition of the Band 1 **population** split into the agreed sub-bands. Table B represents the validated **sample** data from the Autumn analysis. As you can see there are not enough sites representing the 0-10 sub-band and too many in the 30-73.2 sub band.

Table A - BAND 1 POPULATION COMPOSITION					Table B - BAND 1 SAMPLE COMPOSITION (AUT'18)				
LDZ	0 – 10 MWh pa	10 – 20 MWh pa	20 – 30 MWh pa	30 – 73.2 MWh pa	LDZ	0 – 10 MWh pa	10 – 20 MWh pa	20 – 30 MWh pa	30 – 73.2 MWh pa
EA	37.10%	46.30%	12.10%	4.60%	EA	28.33%	50.00%	11.67%	10.00%
EM	34.50%	49.10%	12.30%	4.00%	EM	19.23%	53.37%	15.87%	11.54%
NE	34.60%	46.70%	13.40%	5.30%	NE	24.44%	48.00%	15.11%	12.44%
NO	34.90%	48.70%	12.50%	3.90%	NO	26.67%	55.38%	10.26%	7.69%
NT	39.60%	40.30%	13.60%	6.50%	NT	23.58%	44.81%	19.34%	12.26%
NW/WN	38.40%	45.80%	11.60%	4.20%	NW/WN	26.05%	56.70%	9.20%	8.05%
SC	37.80%	43.50%	13.30%	5.40%	SC	22.62%	52.04%	14.93%	10.41%
SE	39.20%	42.60%	12.70%	5.60%	SE	26.07%	52.99%	14.10%	6.84%
SO	39.00%	45.30%	11.40%	4.30%	SO	22.58%	54.84%	13.31%	9.27%
SW	47.90%	41.30%	7.70%	3.10%	SW	41.39%	43.44%	10.25%	4.92%
WM	35.30%	48.00%	12.50%	4.30%	WM	29.26%	53.28%	10.48%	6.99%
WS	39.30%	46.60%	10.80%	3.20%	WS	30.61%	47.45%	13.78%	8.16%
Total	38.10%	45.10%	12.10%	4.70%	Total	26.83%	51.09%	13.09%	8.99%

Band 1: Sample Data (Autumn'18 Data)

Table C represents the number of sites potentially available for modelling after randomly selecting sites within each sub-band to represent the population. This set of supply points are now a better representation of the population, as shown in Table D and still provide a robust number of sites to model with.

Table C - SAMPLE NUMBERS AFTER RANDOM SELECTION						Table D - REVISED SAMPLE COMPOSITION				
LDZ	0 – 10 MWh pa	10 – 20 MWh pa	20 – 30 MWh pa	30 – 73.2 MWh pa	Total	LDZ	0 – 10 MWh pa	10 – 20 MWh pa	20 – 30 MWh pa	30 – 73.2 MWh pa
EA	68	85	22	8	183	EA	37.16%	46.45%	12.02%	4.37%
EM	40	57	14	5	116	EM	34.48%	49.14%	12.07%	4.31%
NE	55	74	21	9	159	NE	34.59%	46.54%	13.21%	5.66%
NO	52	73	19	6	150	NO	34.67%	48.67%	12.67%	4.00%
NT	50	51	17	8	126	NT	39.68%	40.48%	13.49%	6.35%
NW/WN	68	81	21	7	177	NW/WN	38.42%	45.76%	11.86%	3.95%
SC	50	58	18	7	133	SC	37.59%	43.61%	13.53%	5.26%
SE	61	67	21	2	151	SE	40.40%	44.37%	13.91%	1.32%
SO	56	65	17	6	144	SO	38.89%	45.14%	11.81%	4.17%
SW	101	87	16	7	211	SW	47.87%	41.23%	7.58%	3.32%
WM	67	91	24	8	190	WM	35.26%	47.89%	12.63%	4.21%
WS	60	71	17	5	153	WS	39.22%	46.41%	11.11%	3.27%
Total	728	860	227	78	1893	Total	38.46%	45.43%	11.99%	4.12%

Band 1: Modelling Results examples

Regression analysis, in line with the current EUC modelling approach, has been performed for 2 LDZs (WM and SW) to assess the impacts of the approaches discussed at DESC.

“All Sites” represent using all sites that passed validation in Autumn '18, without any attempt to stratify (i.e. approach taken for recent years)

“Random Sites” represents those sites that passed validation and have been randomly selected to ensure the model is as representative as it can be.

“Weighted Demand” represent “All Sites” but with a weighting applied to the consumption based on the LDZ population weightings (table A)

LDZ: WM	R ²	CWV Intercept	LDZ: SW	R ²	CWV Intercept
All Sites	99%	16.95	All Sites	99%	17.56
Random Sites	99%	16.27	Random Sites	99%	16.96
Weighted Demand	99%	16.48	Weighted Demand	99%	16.97

A good set of R² are produced for all of the 3 approaches.

The CWV intercept provides a good indicator of weather sensitivity within a demand model. For ‘WM’ and ‘SW’ there was a clearer difference between the current approach and randomly selecting sites, which does suggest that using stratification is worthwhile, as its possible those sites in the higher sub-band 30-73.2 where the sample currently has too many, may be ‘overwhelming’ some of the characteristics seen in the lower sub-bands.

Conclusion:

In order to achieve stratification and to minimise the additional effort required to implement changes to the existing process, the Demand Estimation team propose that the “Random Sites” approach is utilised for Spring 2019. With the prospect of further sample data being provided during Spring 2019 it is anticipated that there will be sufficient sample sites available post validation to enable random selection of sites for each sub-band (where necessary).

This will also mean that the individual sites actual consumption can be used in the modelling and will not contradict their calculated AQ, which would be the case if a weighting was applied to all sites within each sub-band.

Views across DESC were split on 11th February, but hopefully the additional work performed here, reassure you of the proposed approach recommended by the Demand Estimation team at Xserve.